FINANCIAL LIBERALISATION AND ECONOMIC GROWTH IN ECOWAS COUNTRIES

by

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Submitted in accordance with the requirements for the degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject of

ECONOMICS

at the

UNIVERSITY OF SOUTH AFRICA

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May 2012

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The Thesis Statement

Declaration

I declare that *"FINANCIAL LIBERALISATION AND ECONOMIC GROWTH IN ECOWAS COUNTRIES"* is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references**.**

Summary

The thesis examines the comprehensive relationship between all aspects of financial liberalisation and economic growth in three countries from the Economic Community of West African States (ECOWAS). Employing ARDL bounds test approach and real GDP per capita as growth indicator; the thesis finds support in favour of the McKinnon-Shaw hypothesis but also finds that the increases in the subsequent savings and investments have not been transmitted into economic growth in two of the studied countries. Moreover, the thesis also finds that stock market developments have negligible or negative impact on economic growth in two of the selected countries. The thesis concludes that in most cases, it is not financial liberalisation polices that affect economic growth in the selected ECOWAS countries, but rather increase in the productivity of labour, increase in the credit to the private sector, increase in foreign direct investments, increase in the capital stock and increase in government expenditure contrary to expectations. Interestingly, the thesis also finds that export has only negative effect on economic growth in all the selected ECOWAS countries. The thesis therefore, recommends that long-term export diversification programmes be implemented in the ECOWAS regions whilst further investigation is carried on the issue.

Keywords

Dedication

This thesis is dedicated to: My wife, Cordelia Owusu (MCIPS, MSc, MBA), UK; My sons, Master Frederick Owusu-Finkgräf, UK and Master Aleksander Owusu-Finkgräf, UK; My Mother, Madam Hilda Addo, Ghana; and the parents of my wife, Dr and Mrs Klaus & Annemarie Finkgräf, Germany.

Acknowledgements

ACRONYMS	Meaning
ADF	Augmented Dickey Fuller Unit Root Test
AFRC	Armed Forces Revolutionary Council
AGC	Ashanti Goldfields Company
AIC	Akaike Information Criteria
ARDL	Autoregressive Distributed Lag
BOFID	Bank and other Financial Institution Decree
BRVM	Bourse Regionale des Valeurs Mobiliers
BVA	Bourse des Valeurs d'Abidjan
CAL	Capital Account Liberalisation
CBN	Central Bank of Nigeria
CFA	Communaute Financiere Africaine
CMD	Capital Market Development
CPI	Consumer Price Index
CPS	Credit to the private Sector
CUB	Creation of Universal Banking
CUSUM	Cumulative Sums Recursive Residual
CUSUMSQ	Cumulative Sum of Squares of Recursive Residual
DF-GLS	Dickey Fuller Generalised Least Squares
DMD	Demonetisation of Domestic Currency
DW	Durbin-Watson Criteria
ECM	Error Correction Model
ECOWAS	Economic Community of West African States
ERP	Economic Recovery Programme
FDI	Foreign Direct Investment
FINSAP	Financial Sector Adjustment Programme
FRA	Forward Rate Agreement
GDP	Gross Domestic Product
GLS	Generalised Least Squares

GMM	Generalised Method of Moments
GSE	Ghana Stock Exchange
IC	Ivory Coast
INTRP	Institutional Restructuring
IPO	Initial Public Offer
IRL	Interest Rates Liberalisation
IRP	Interest Rate Policies
M1	Narrow Money
M2	Broad Money
MC	Stock Market Capitalisation
MCP	Monetary Control Policies
MENA	Middle East and North Africa
NDC	National Democratic Congress
NDIC	Nigeria Deposit Insurance Corporation
NRF	Non-Resident Foreign Investor
NSE	Nigerian Stock Exchange
OHADA	Organisation for the Harmonisation of Business Law in Africa
OLS	Ordinary Least Squares
OMO	Open Market Operation
OTC	Over-The-Counter
PCA	Principal Components Analysis
PCEC	Primary Commodity Exporter Country
PNDC	Provisional National Defence Council
PNDCL	Provisional National Defence Council Legislation
PP	Phillips and Perron Unit Root Test
SAP	Structural Adjustment Programme
SBC	Schwarz Bayesian Criteria
SEC	Securities and Exchange Commission
SFEM	Second-tier Foreign Exchange Market

SME	Small and Medium Enterprises
SRRP	Secondary Reserve Requirement Policies
SSM	Secondary Security Market
TFS	Total Financial Savings
TR	Stock Market Turnover
UECM	Unrestricted Error Correction Model
UMOA	Union Monetaire Ouest Africain
VECM	Vector Error Correction Model
VT	Stock Value Traded
WAEMU	West African Economic Monetary Union

Chapter One

Introduction to the Study

1.1   Background of the Study

The relationship between financial liberalisation and economic growth has received considerable attention in recent theoretical and empirical studies. McKinnon (1973) and Shaw (1973) and later Kapur (1976), Mathieson (1980) and Fry (1989 and 1995) have presented the theoretical framework for this relationship. The main policy implication of the McKinnon-Shaw framework is that government restrictions on the financial system like interest rate ceiling, high reserve requirement and directed credit policies, stifle financial deepening and hence reduce economic growth. On the other hand, a small but growing literature such as Van Winjnbergen (1983) and Stiglitz (1994) are of the view that financial markets imperfections like asymmetric information and imperfect competition mean that financial liberalisation can have a negative effect on economic growth and development.

Financial Liberalisation hypothesis as postulated by McKinnon (1973) and Shaw (1973) is expected to impact positively on economic growth and development directly at the national level and indirectly at the individual level. Levine (1997) stresses that financial systems promote more effective exchange of goods and services as well as mobilises individual and corporate savings. It also promotes more efficient allocation of scarce resources and promotes monitoring of corporate management through capital markets and allowing for risk pooling. Goldsmith (1969), McKinnon (1973), Shaw (1973), and Fry (1995) are of the view that without these intermediaries, investment or risk taken might not take place, technological progress is likely to be held back and economic growth might be slower. In other words, the financial system helps to raise surplus funds from those whose current income exceeds their current consumption and

redistributes them to people or businesses that need them to invest as loans, or credits to those who want to bring forward consumption against future income and profitable investments.

The theory of financial liberalisation since McKinnon (1973) and Shaw (1973) has advanced from focusing on credit markets and interest rates to include the private sector. In some of the recent studies, the debate has been focused on the dynamics of the liberalisation of debt (bonds) and equity markets and its effect on economic growth in developing countries. Capital account liberalisation refers to a deliberate policy by which a government of a country allows foreign investors to participate in the domestic shares and bonds market and at the same time allows domestic investors to trade in foreign securities. Supporters of capital account liberalisation argue that international capital flows from financial liberalisation lead to lower cost of capital, allow for risk diversification, encourage investment in projects with higher returns, and leads to integration into the world financial system.

Bekaert and Harvey (1995) argue that if a country were to liberalise its capital account, then capital inflows across borders would equate the price of risk across all markets and therefore eliminate the said risk. Henry (2000) argues that stock market liberalisation reduces the cost of equity through the decrease in interest rates as a result of increase in the net capital inflows that could reduce the risk-free interest rate. In another paper, Levine and Zervos (1998) argue that an increase in capital inflows may improve the financial market liquidity, hence leading to the reduction of equity premiums. Furthermore, Levine (2005) reviewing theoretical and empirical studies on the subject of finance and growth, finds that the preponderance of evidence suggests that both financial intermediaries and markets matter for growth and that reverse causality alone is not the driver of this relationship. He concludes that both theory and evidence imply that better developed financial systems ease external financing constraints facing firms, which illuminates one mechanism through which financial development influences economic growth.

Most of the previous studies completed on financial liberalisation and economic growth are based on evidences which are mostly from Latin American and the East Asian countries with little attention devoted to African countries, especially those in the ECOWAS sub-region. This thesis will empirically investigate and provide insight into the impact of financial liberalisation,

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both interest rate liberalisation and capital account liberalisation, on economic growth in three countries, namely Ghana, Nigeria and Ivory Coast, all being members of the Economic Community of West African States (ECOWAS)[1].

In this investigation, the thesis constructs a financial liberalisation index factor[2], which encompasses all the relevant policies of financial liberalisation taken in each country using principal component analysis (PCA). The thesis employs the more efficient univariate Dickey-Fuller generalised least squares (DF-GLS) test for autoregressive and the Phillips and Peron (PP) unit root tests rather than the conventional augmented Dickey-Fuller (ADF) to test for the stationarity of the variables used in this study. After that, the thesis applies the empirical analytical method of autoregressive distributed lag (ARDL) – Bounds testing approach in an attempt to establish a long-term relationship between financial liberalisation and economic growth using time series data. Lastly, a dynamic unrestricted error correction model (UECM) will be derived from the ARDL – Bounds testing models. The same procedure has been applied by Shabhaz et al. (2008) and Babatunde (2008), among other researchers. The three selected countries – Ghana, Nigeria and Ivory Coast, represent more than 80% of the total economic activities of the Economic Community of West African States (ECOWAS) region.

Among the three countries selected, Nigeria has the most developed financial system. With a population of about 155 million people (UN, 2009) and a national income of $180 billion (World Bank, 2008), it is the powerhouse of the ECOWAS sub-region. Nigeria changed its economic policy from direct to indirect market – determined through the Structural Adjustment Programmes (SAP), in 1986. Controls on interest rates were completely removed in the late 1980s and banks' liquidity ratios and capital adequacy standards were reviewed in 1989. However, controls on credits were fully dismantled in 1992. In 1991, the Central Bank of Nigeria was empowered to regulate and supervise all financial institutions in the country. Exchange rate controls were removed in 1988 but in 1994, interest and exchange rate controls were re-imposed.

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[1] The Economic Community of West African States is made up of 15 countries in the in the West African sub-region, namely: Benin, Burkina Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea-Bissau, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

[2] This factor will be used instead of dummies to represent the effect of financial liberalisation policies in the selected countries. A similar approach was employed by Caprio et al. (2001) and Laeven (2003).

Although the monetary authorities expected interest rates to be positive in real terms after their deregulation, they generally remained negative.

By the standards of ECOWAS, the financial system in Nigeria is considered to have one of the most developed and sophisticated financial systems, which is mainly domestically owned, in the sub-region. Before the SAP in 1986, Nigeria had about 29 money deposit banks and 12 merchant banks with a total branch network of 1,394. As at the end of 2006 the number has grown to about 89 money deposit banks and 40 merchant banks with a total branch network of about 4,020. However, in 2006, the Central bank of Nigeria (CBN) embarked upon a policy of banks' recapitalisation programme. At the end of the recapitalisation exercise in 2009, out of the 89 money deposit banks, only 25 banking groups emerged, and a further 14 banks which could not secure recapitalisation were liquidated. Furthermore, as part of the SAP, Nigeria established a stock exchange in 1988 which was fully liberalised in 1992.

In Ghana, a similar approach as in Nigeria was adopted. Ghana was forced to accept an Economic Recovery Programme (ERP) in 1983 as a result of economic crisis. As part of the ERP, financial reforms began in 1986 when a two-window system of exchange rate determination was established. These were unified in 1987 and fully liberalised in 1992. To foster the speedy reforms of the financial sector, a new banking law was promulgated in 1989 following the advice of the IMF and the World Bank. Starting in 1987, a gradual liberalisation strategy was pursued and nominal interest rates were reviewed regularly. Major reviews were specifically undertaken in 1988, 1989 and 1990 leading to total removal of all controls in 1991.

The financial system in Ghana is fairly well developed compared to most of the countries in the sub-region. Today the system comprises banks, non-banking financial institutions, building societies, mortgage firms, forex bureaux and rural or community banks, as well as credit unions. As at the beginning of the ERP in 1986, the country had 10 commercial banks, about 105 rural banks and only one building society. As at mid-2010, the country has 26 licensed banks, 44 non-banking financial institutions, 2 building societies, 135 rural or community banks and about 273 forex bureaux networks. As part of the ERP, in 1989 a stock exchange was established but didn't

begin trading until 1990. In 1993, foreign investors were allowed to participate in the stock exchange with restrictions. However, these restrictions were removed completely in 2006.

The financial system in Ivory Coast is entirely different from that of Ghana and Nigeria who have similar financial systems. Ivory Coast share currency with 7 other countries in the ECOWAS sub-region and therefore its financial system is heavily influenced by the policies of the West African Economic Monetary Union (WAEMU) which serves as the central bank for the eight countries. This means that Ivory Coast lacks the monetary independence that is enjoyed by Ghana and Nigeria. However, similar to Ghana and Nigeria, prior to the interest rate liberalisation in 1989, Ivory Coast faced the same problems of financial repression in the form of interest rate controls and direct government controls on credit.

Although financial reforms in Ivory Coast started in 1989, fully fledged financial liberalisation policies started in 1990 when the WAEMU abolished its preferential discount rate, allowing the rate to be determined by market forces in each member country. This was followed by bank de-nationalisation and restructuring together with tightening of prudential regulations in the same years as the liberalisation of interest rate. In 1991, Ivory Coast removed controls on credits. The Ivorian financial sector is a bit narrow compared to that of Ghana and Nigeria. Currently it has about 29 banks and financial institutions with penetration of about 210 branches. In 1988, Ivory Coast established a stock exchange which traded as part of the domestic financial systems, however, in 1998, it was liberalised to allow for foreign investments by making it a regional stock exchange for the 8 countries which are members of the WAEMU and who share the same currency, the CFA.

1.2   Objectives and hypotheses of the Study

1.2.1   Objective of the Study

The main objective of this thesis is to empirically examine and investigate the impact of financial liberalisation, both interest rate and capital account liberalisation, policies on economic growth in three ECOWAS countries. The objective is sub-divided as:

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1) To empirically test the impact of real interest rates on savings, financial deepening and investment, i.e. the McKinnon-Shaw hypothesis in the selected countries.

2) To empirically examine the various linkages between interest rate liberalisation and economic growth in the selected countries.

3) To empirically test the impact of capital accounts liberalisation on the economic growth in the selected countries.

4) To empirically test the existence of long-run relationship between financial liberalisation (interest rate liberalisation and capital account liberalisation) and economic growth in the selected countries.

1.2.2   Hypotheses of the Study

In order to achieve the objectives of the thesis, the thesis will test the following hypotheses using the econometric method mentioned above and time series data from the three ECOWAS countries, namely: Ghana, Nigeria and Ivory Coast.

a) That interest rate liberalisation leads to increase in savings.

b) That interest rate liberalisation leads to increase in investment through increased savings.

c) That liberalisation of interest rate has positive effect on economic growth.

d) That stock market developments lead to increase in economic growth.

e) That capital account liberalisation leads to increase in economic growth.

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f) That financial liberalisation (interest rate and capital account liberalisations together) leads to economic growth.

1.3   Significance of the Study

This thesis contributes to the literature on financial liberalisation by establishing whether financial liberalisation has any positive influence on savings, investment efficiency and hence economic growth in the selected ECOWAS countries. The period covered in this thesis is from 1969 and 2008, thus covering both the periods of financial repression and financial liberalisation. However, the main period of this thesis is the post liberalisation periods. In the empirical analysis, financial liberalisation, interest rate and capital account will be represented by three index factors which encompass all the relevant policies of financial liberalisation taken in each country using principal component analysis (PCA). The motivation for using the index factors is to ensure that all the various policies implemented towards the attainment of full financial liberalisation status are taken into account for the selected countries and also to help solve the problem of quantification of the effect of financial liberalisation, which is usually one of the problems associated with empirical studies in this area. The term financial liberalisation, henceforth, would be used interchangeably to refer to either interest rate liberalisation, capital account liberalisation or both.

Secondly, as mentioned earlier, most of the earlier studies completed on financial liberalisation and economic growth are based mostly on evidence from Latin American and the East Asian countries, with little attention devoted to African countries, especially the ECOWAS region. For economic growth indicator, the thesis uses Gross Domestic Product (GDP) per capita. The potential weakness of this research will be that the results should be applied to any other country with caution.

Thirdly, the thesis employs the ARDL – Bounds testing approach and unrestricted error correction model (UECM) to co-integration analysis developed by Pesaran and Shin (1999) to establish both the short run and long run relationships, as opposed to other multivariate co-integration methods such as Johansen and Juselius (1990). The ARDL – Bounds testing

approach is adopted for the following three reasons. Firstly, it is simple, i.e. it allows the co-integration relationship to be estimated by OLS once the lag order of the model is known. Secondly, the bounds testing procedure does not require pre-testing of the variables included in the model for unit roots unlike the other methods, such as the Johansen methodology. In other words, it is applicable irrespective of whether the regressors in the model are purely I(1), or mutually co-integrated. Lastly, the test is relatively more efficient in small or finite sample data sizes as in the case of this thesis. The procedure will, however, crash in the presence of I(2) variables (Pesaran and Shin, 1999).

This thesis is among the first to examine in detail, the dynamic impact of interest rate and capital account liberalisation on economic growth in the selected ECOWAS countries (Ghana, Nigeria and Ivory Coast) using constructed financial liberalisation indices and the ARDL – Bounds testing approach by looking at the effects of financial liberalisation on the GDP per capita and how it affects the overall economic growth. Very few studies in this region have entailed such an exhaustive investigation into this relationship.

1.4   Motivation for choosing the Countries Selected

The thesis uses time series data from three West African countries, namely, Ghana, Nigeria and Ivory Coast, for the empirical analysis. Moreover, these countries are all members of the Economy Community of West African State (ECOWAS). The main motivation for selecting these countries is therefore their different characteristics and similarities in their economic structure, location as well as the total lack of empirical evidence on their financial liberalisation policies, especially empirical evidence on Ghana and Ivory Coast.

Secondly, these three countries were chosen because they all depend heavily on primary commodities export for a major part of their foreign exchange revenue - Crude Oil provides Nigeria with about 90% of their total export revenue. Cocoa beans and Gold provide about 70% of the total export revenue for Ghana, whilst Cocoa, Coffee and Crude Oil provide about 80% of the total export revenue in Ivory Coast.

Finally, the countries were selected because of their financial systems. Ghana and Nigeria have their own independent monetary authorities, financial systems, stock market and currency, whereas Ivory Coast is a member of the West African Economic and Monetary Union (WAEMU) which act as the monetary authorities for eight countries and shares the same currency with them. Ivory Coast hosts the regional stock exchange, Bourse Regionale des Valeurs Mobilieres SA (BRVM), which was established in 1998 and has the same membership as those in the currency union. To add to the above motivating factor, the selected countries are the only countries out of the 15 ECOWAS countries which have their own Stock Exchange markets, and as the main objective of this thesis is to empirically examine and investigate the impact of financial liberalisation, both interest rate and capital account liberalisation they are the only countries that can be included in the study.

1.5   Organisation of the Study

The thesis is organised in nine chapters as follows. Beside chapter one, Introduction to the Study, chapter two, will review the existing empirical and theoretical world literature on the relationship between interest rate liberalisation and economic growth. In chapter three, the thesis reviews the relationship between capital account liberalisation and economic growth. In chapters four, five and six, the thesis analyses the experiences of financial liberalisation in the Ghanaian, Nigerian and Ivorian financial sectors respectively. The thesis reviews the existing empirical literature on financial liberalisation in the selected countries and employs various descriptive statistical measures to support the analysis. In chapter seven, the thesis will specify the empirical models for the analysis and the estimation techniques. Chapter eight discusses the empirical findings and the econometric analysis. Finally, in the last chapter, based on the outcome of the preceding analysis and the context of the economic conditions in each of the selected countries, the thesis offers some conclusions, implications and policy recommendations.

Chapter Two

Interest Rate Liberalisation and Economic Growth

2.1   Introduction

This chapter is the first of the two chapters of the thesis that focus on the theoretical and empirical literature review of the impact of financial liberalisation on economic growth. The chapter is sub-divided into seven sections, including this introduction. In the second section is the review of the origins of interest rate liberalisation. Literature on the theoretical arguments in favour of interest rate liberalisation (i.e. McKinnon's (1973) complementarity's hypothesis and Shaw's (1973) debt intermediation hypothesis) is reviewed in section three. In section four, the literature on the theoretical arguments against interest rate liberalisation (i.e. Keynesian, New-Keynesian, Neo-Structuralist, Stiglitz-Weiss, etc) is reviewed. The next section looks at the theoretical linkage between interest rate liberalisation and economic growth. Section six presents the review of the empirical literature whilst section seven provides some concluding remarks.

2.2   Origins of interest rate liberalisation

Since Schumpeter (1911) put the role of financial intermediation right in the middle of economic development, economists have been debating on the impacts of the financial sector on economic growth. Most of the debates have been focused on the question whether the financial sector is the source of economic growth or financial sector developments come about as a result of economic development or growth. In other words, does economic development cause the development of

the financial sector? Robinson (1952) argues that financial intermediation does not cause economic development but rather it is a consequent of industrialisation. This view dominated the debate until the middle of the 1960s.

Gerschenkron (1962), Goldsmith (1969) and others, all highlighted the important role that the financial sector can play in the process of economic development. During the 1970s, the discussion concentrated on the phenomenon of financial repression, a policy implemented by governments of many developing countries to generate growth and raise revenue by setting artificially low interest rates and inflationary monetary policies. This policy was undertaken based on theoretical works by Keynes (1936) and Tobin (1965), who advocated for government interference in the credit market.

McKinnon (1973) and Shaw (1973) were the first to suggest theoretical arguments against these policies of financial repression. They pointed out the important role of the financial sector in increasing the volume of savings as a result of creating appropriate incentives. In order to reach higher savings and hence investment rates, McKinnon (1973) and Shaw (1973) argue that governments should abolish interest rate ceilings and allow real interest rates to be determined by the market. This, they argue, will lead to an increase in savings and hence investment, and ultimately lead to economic growth as well as bringing inflation down (Gibson and Tsakalotos, 1994). Based on this hypothesis, many governments in the developing countries liberalised their interest rate with some achieving significant accelerations in economic growth rates, but in some cases the policy was associated with excessively high and volatile real interest rates as well as stagflation (Grabel, 1995).

Financial repression is defined very widely in the literature. An economy is described as financially repressed if it has a broad range of characteristics. According to McKinnon (1989), an economy is financially repressed when tax and otherwise distort the domestic capital market. These taxes and distortion, he argues, take two general forms: interest rate controls and direct credit allocation programmes. According to Eschenbach (2004), financial repression can also be the combination of indiscriminate nominal interest rate ceilings and high and accelerating inflation. A high reserve requirement may also play a role. Financial repression was based on the

theory of liquidity preference propagated by Keynes (1936). He argues that the full employment equilibrium level of real interest rate tended to be lower than the one generated by liquidity preference. So interest rates had to be lowered in order to avoid a fall in income. Tobin (1965) also suggests a model whereby small household producers allocate their wealth among money and productive capital. He argues that financial repression reduces the demand for money in favour of productive capital, thereby increasing the capital/labour ratio and accelerating economic growth.

During the 1980s, the neo-structuralists criticised the McKinnon-Shaw school of thought and argued that interest rate liberalisation[3] would slow down economic growth. Their arguments followed similar points as those put forward by Keynes and Tobin. The principal critics of the McKinnon-Shaw hypothesis are Van Wijnbergen (1983) and Taylor (1983). Using Tobin's portfolio framework for household, which states that household choice of investments includes time deposit, loans to business through the informal sector and gold or currency, they argue that in response to increase in interest rate on deposits, household will substitute these for gold or cash and loans in the informal sector.

Van Wijnbergen (1983) contrasts his hypothesis to those of McKinnon (1973) and Kapur (1976). He expresses the view that the outcome of McKinnon-Kapur depends crucially on one implicit assumption on asset market structure, an assumption that is never stated explicitly: that the portfolio shift into bank deposit is coming out of "unproductive" assets like gold, cash or inventories. Van Wijnbergen (1983) further argues that it is not at all obvious that bank deposits are a closer substitute to cash or gold, rather to loan extended on the informal sector. Stiglitz (1989) also criticises the policy of financial liberalisation on the theoretical ground of market failures in financial markets.

Neo-structuralists argue that high interest rates increase inflation in the short run through cost-push effects and decelerate economic growth as a result of a reduced real credit volume. These theoretical considerations are, however, complemented by policy requirements in developing countries where, if the government is unable to collect sufficient tax revenue, it imposes financial

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[3]Please note that Interest rate liberalisation and financial liberalisation have been used interchangeably in this chapter to mean the same thing.

repression measures as an implicit tax on the financial sector (Fry, 1995). Fry (1995) states that financial repression is a severe and unintended form of financial restriction, which he considers as a second best policy for governments with low tax-raising power. Reserve requirements, obligatory holdings of government bonds, or interest rate ceilings help the authorities in diverting savings to the public sector at low to zero costs.

The main focus of the interest rate liberalisation hypothesis is financial repression. The hypothesis asserts that repression is harmful for long-term economic growth because it reduces the amount of funds or savings available for investments and hence stifles economic growth (McKinnon, 1973). McKinnon (1973) and Shaw (1973) put up strong arguments against the dominant theoretical hypothesis of financial repression. In contrast to Keynes (1936) and Tobin (1965), they argue in favour of interest rate liberalisation and abolition of other forms of financial repression policy measures. The tenet of their model comprises financial intermediaries, savers and investors and was based on an inside money model (Fry, 1995). This is because loans to the private sector are backed by the internal debt of the private sector whereby the nominal interest rate is fixed to hold the real rate below its equilibrium level (Fry, 1995). They suggest a model where saving is a positive and investment a negative function of the real interest rate. In their model, if real interest rate is reduced as a result of either accelerating inflation or a decrease in the fixed nominal interest rate, then savings is expected to decrease. The inflation effect, they argue, is hedged against land ownership and therefore any decrease in the real interest rate will stimulate demand for land. This is because deposits of fund within the financial system become less attractive (Fry, 1995).

McKinnon and Shaw stress that the shift in savings from the financial sector to land acquisition and ownership will drive land prices up faster than the overall price level. Accordingly, the induced wealth effect will lead to an increase in consumption, hence a reduction in savings and investment. Furthermore, they point out that if there is financial repression where the nominal interest rate has been fixed below the equilibrium rate then two scenarios are possible. Firstly, with fixed deposit rates, there will be a large spread between lending and deposit rates. Secondly, if both the lending and deposit rate are fixed, there will be a rationing of credits. In such circumstances, credit will be allocated based on criteria such as transaction costs, the perceived

risks of default, quality of collateral, political influence of borrowers, reputation of borrowers, and covert credits to loan officers rather than expected investment productivity (McKinnon, 1973 and Shaw, 1973). In such a situation, they further argue that the average efficiency of investment will be reduced because investments with lower returns may become profitable as a result of a fixed lower lending rate. Adverse selection will take place because some borrowers may have entered the market after the rate was fixed. Risk taking behaviour of the operators in the financial sector will be affected negatively because they cannot charge the appropriate risk premium. The policy prescription proposed by McKinnon (1973); Shaw (1973) is therefore to abolish all the institutional constraints on nominal interest rates and to reduce inflation.

Although McKinnon (1973) and Shaw (1973) essentially reached the same conclusions, their theoretical models were different. McKinnon's complementarity model is based on the assumptions that all economic agents are restricted to self-finance and that there are important indivisibilities in investment activities. He makes no distinction between savers and investors. He postulated that an investor must accumulate money balances or other financial assets in advance in order to undertake investments later. So in this situation, there exists an inter-temporal complementarity of demand for money and physical capital. In other words, in McKinnon's world, money is positively related to the propensity to invest (save), given the prevalence of "self-finance". Fry (1995) explained that since investors cannot borrow to finance investment in McKinnon's model, such models are said to be outside money. He further points out that in contrast to inside money, outside money models are backed by loans to the government and not by the internal debt of the private sector. If money is only outside money, banks hold government bonds and make no loans to the private sector (Fry, 1995).

On the other hand, in Shaw's debt intermediation model, there is no need for complementarity as investors are not confined to "self-finance". According to Fry (1995), Shaw's model can be classified as an inside money model. Shaw (1973) postulates that financial intermediaries sustain deposit accumulation by raising real interest rates to savers, and by so doing expands their lending potential. On the other side, Shaw (1973) argues that intermediaries lower the real costs of lending to investors through such techniques as risk diversification, economies of scale in

lending, improved operational efficiency, lower information costs to savers and investors, and accommodation of liquidity preference.

McKinnon's complementarity hypothesis and Shaw's debt intermediation hypothesis, however, do not necessarily contradict each other, because investment may be financed through both external and internal sources. McKinnon's complementarity hypothesis refers mostly to developing countries, whereas Shaw's debt intermediation analysis refers mostly to more advanced economies with sophisticated financial systems. Since McKinnon (1973) and Shaw (1973), a number of studies have emerged which support and extend the original hypothesis. Most of these models which seek to formalise the hypothesis concentrate on the effects of financial liberalisation, either on the quantity of investment (Kapur, 1976; Mathieson, 1980) or on its quality (Galbis, 1977).

2.2.1   Theoretical arguments in favour of interest rate liberalisation

The main proponents of the McKinnon-Shaw hypothesis are Kapur (1976), Mathieson (1980), Galbis (1977) and Jao (1985), among others. Kapur (1976), for example, examines the impact of financial liberalisation in an economy characterised by under-utilised fixed capital and surplus labour. He argues that the real supply of credits affects capital accumulation through its role as the sole source of finance for working capital requirements. Real credit supply is determined by the demand for broad money, which itself is a function of inflation and the deposit rate of interest. A rise in the deposit rate works more indirectly on the supply of credits and hence the supply of banks deposits increases. This allows banks to give more credits. Mathieson's (1980) model is similar to that of Kapur (1976) with the only difference being that bank credit finances are not only additions to working capital, but also to fixed assets. In both Kapur (1976) and Mathieson (1980), increased growth is the result of an increase in the quantity of investment while McKinnon and Shaw's growth is as a result of an increase in the quantity and quality (see Figure 2.1) of investments (Gibson and Tsakalotos, 1994).

Kapur (1976) was one of the first models to examine the simultaneous interest rate liberalisation and stabilisation in a closed economy set-up. Kapur notes that stabilisation programmes

normally involve a decline in real output when prices are sticky and there are adaptive expectations. This, he says, occurs because the reduction in the rate of growth of the nominal money supply by the policy makers leads to a fall in the real money supply and hence to a fall in the supply of bank credits. He further argues that if instead the deposit rate is increased, then the excess supply of money (which is the cause of inflation) is eliminated by the induced rise in the demand for broad money. Inflation is therefore brought under control and the increase flow of deposits allows banks to make more credit available to firms, which in turn will increase output[4]. The advantage of the raising interest rates is therefore clear - the squeeze on output which usually accompanies more traditional stabilisation programmes is completely avoided (Kapur, 1976).

Jao (1985), however, notes a problem with Kapur's (1976) approach to simultaneous interest rate liberalisation and stabilisation. He argues that if deposit rate rises and banks are engaging in positive maturity transformation[5], then bank profits will be squeezed below normal as the loan rate on the existing loans cannot be raised. This problem will not arise if loans and credits are given out on a variable interest rates basis[6].

Most developing countries undertaking interest rate liberalisation and stabilisation programmes are, however, open economies and experience and evidence have shown that the question of exchange rate policy is crucial to the success of interest rate liberalisation. This is because it affects capital flow through its impact on the expected rate of depreciation on the domestic currency. Such inflow could undermine the ability of the financial authorities to control the monetary base and therefore put the stabilisation programme in jeopardy. To prevent this happening, Edwards (1984) argues that the more prudent strategy would be to liberalise the current accounts first. This is because, if the capital accounts are liberalised first, there is ample evidence from Latin America that the inflow of capital that follows has destabilising and in general negative effects, which will jeopardise other aspect of the liberalisation package. He therefore suggests, however, that after the current account has been liberalised, the capital

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[4] It is important that the lending rates do not rise too far above the deposit rates. If lending rates are very high the increased credit supply will not be demanded (Kapur, 1976).
[5] That is borrowing short-term and lending long-term
[6] That is interest rates on long term loans varies throughout the course of the loan as market interest rates vary

account should be liberalised gradually so that the increase in foreign debt that will follow will be spread over time in order to reduce the real appreciation and exchange rate depreciation.

Kapur (1983) is concerned with determining an exchange rate policy that will prevent capital inflow so as not to undermine the attempts of reducing inflation. Mathieson (1979) argues that, if capital flows are anticipated then, they could be beneficial. Kapur (1983) shows that the choice of exchange rate policy is rather tricky. This is because the exchange rate affects both the prices of imported inputs and also capital flows through the effect of the expected rate of depreciation. The actual exchange rate level policy chosen will depend on where initial inflation is relative to its target level. What is crucial is that exchange rate policy must be set in co-ordination with the deposit interest rate in order to avoid potentially damaging capital flows.

Mathieson (1979) argues that the optimal policy is to over-depreciate the exchange rate, reduce the rate of monetary growth and increase loan and deposit rates. The increase in deposits and hence loan rates removes credit rationing, which allows output to rise. It is very important that the increase in interest rate is co-ordinated with the exchange rate policy. The deposit rate must therefore not be increased so as to generate large capital inflows, instead, the deposit rate should be increased moderately. This will attract flow of deposit from domestic source as well as moderate capital inflow. The implication is that growth can remain above its steady-state level and the higher output set the stage for a fall in the inflation by eliminating the excess demand for goods.

2.2.2 Theoretical arguments against interest rate liberalisation

The principal critics of the McKinnon-Shaw hypothesis are Van Wijnbergen (1983) and Taylor (1983)[7]. Using Tobin's portfolio framework for household, thus household choice of investments includes time deposit, loans to business through the informal sector and gold or currency, they argue that in response to increase in interest rate on deposits, household will substitute these for gold or cash and loans in the informal sector. As Lucas (1988) pointed out,

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[7] See also Grabel (1995, 1994), Studart (1996), Dutt (1990) and Paul and Dutt (1991)

economists `badly over-stress' the role of the financial sector, thereby reinforcing the difficulties of agreeing on the link and its direction between finance and economic growth (Arestis, 2005b).

Van Wijnbergen (1983) contrasts his model to those of McKinnon (1973) and Kapur (1976). He expresses the view that the outcomes of McKinnon-Kapur models depend crucially on one implicit assumption on asset market structure, an assumption that is never stated explicitly: that the portfolio shift into bank deposit is coming out of "unproductive" assets like gold or cash and inventories. He further argues that it is not at all obvious that bank deposit are closer substitute to cash, gold, livestock and other commodities but rather to loans extended on the informal sector.

Taylor (1983) argues that McKinnon-Shaw hypothesis may be wrong on two accounts. Firstly, an increase in the desire to save reduces aggregate demand and makes economic contraction more likely than economic growth (a "Keynesian" viewpoint). Secondly, bank deposit may increase following the rise in real deposit rate. Taylor argues that the impact of this on credit availability will crucially depend on where these deposits come from. If inflow of deposits into the banks comes from the assets of the previously non-productive sector then there will be a positive impact on credit availability, but if deposits flow from informal sector then total credit supply will contract. This is because banks are subjected to reserve requirement whereas informal operators are not (Gibson and Tsakalotos, 1994). Van Wijnbergen (1983) and Taylor (1983) argue that financial liberalisation is thus stagflation. Taylor (1983) suggests that in aiming at improving capital accumulation, developing countries should tackle more directly through increasing capital utilisation and creating an atmosphere of confidence in which "animal spirits" will encourage investment.

Another school of critics to the McKinnon-Shaw hypothesis are the post Keynesians. They emphasise the function of effective demand and argue that income distribution influences effective demand and therefore contrast the McKinnon-Shaw hypothesis as a separate investment and savings functions that have typical Keynesian characteristics. The implication is that interest rate liberalisation could lead to a fall in output and growth and hence financial instability.

Paul and Dutt (1991) looking at the implementation of interest rate liberalisation in a closed economy which have excess capacities argue that a rise in the deposit interest rate has two outcomes. Firstly, a rise in deposit interest rate increases the supply of deposits and hence credits leading to a fall in the equilibrium interest rate and a rise in investment and hence economic growth. Secondly, it increases the marginal propensity to save. They conclude that it is highly likely that on balance, consumption will fall leading to a negative effect of the liberalisation policy.

Also, Stiglitz and Weiss (1981) basing their argument on microeconomic underpinnings of macroeconomic policies show that disequilibria in the credit market can be caused by other factors other than government intervention. They argue that, market clearing rates are neither efficient nor optimal as a result of adverse selection and incentive effects. They suggested that high and market clearing interest rates may attract bad borrowers or they may induce borrowers to undertake riskier investment projects and as a result borrowers are more likely to default. In such case, operators in the financial system may decide not to raise the interest rate to its market clearing level resulting in credit rationing in favour of large size loans. They argue that these are due to adverse outcomes in microeconomic policies of a free credit market.

Furthermore, Mankiw (1986) discusses the problem of financial collapse in the context of interest rate liberalisation. He suggests a model in which small changes in the interest rate could change the riskiness of the pool of borrowers. He argues that the credit market may collapse if the pool of loan applicants is perceived to be too risky to give the banks their required return. Also, he argues that the restrictive monetary policy implemented may do more than move the economy along the marginal efficiency of capital route leading to financial crisis.

In addition, Shleifer and Vishny (1986) as well as Stiglitz (1985) analysing the principal agent problems in the context of a corporation with multiple of small owners argue that each of the owners may not be interested to monitor the management as it may not pay. This free rider problem arises from the public good character of the costly information acquisition of an individual stockholder who may easily liquidate his financial commitment (Ecshenback, 2004).

A further strand of the literature related to market failure addresses the issue of asymmetric information in credit markets. Diamond (1984) for example, argues that banks emerged as a result of information asymmetries between borrowers and savers. Proponents are of the view that in the costly state verification approach, financial intermediaries can verify the success of investment only at the monitoring cost, which the financial intermediaries try to minimise. They stress that information asymmetries are a problem because they may lead to capital misallocations and high monitoring costs. In line with this, Williamson (1987) shows that high monitoring cost may cause equilibrium in credit rationing, even in the absence of other market failures.

Moral hazard is an issue often discussed with respect to deposit insurance schemes. Originally designed to correct negative externalities running from financial activities to their customers, deposit insurance may cause yet another type of market failure if it encourages risk taking by financial managers. Gennotte and Pyle (1991) show that implementing more restrictive capital requirements in the presence of deposit insurance may lead to an increase in asset risk. They suggest that one can use the legislations and regulations to monitor and control asset risk.

2.3 Interest rate liberalisation and Economic growth – A theoretical Linkage

The main theoretical analysis which provided a rationale for domestic or interest rate liberalisation as a means of promoting savings and investment and hence economic growth, was postulated by McKinnon (1973) and Shaw (1973). The models they postulated rely mainly on financial repression in the form of ceilings on interest rates on deposits and loans. They argue that real interest rates influence growth in the economy through their effects on savings and investment. That investment demands (I) is a negative function of the real interest rate of interest (r):

$$I = I(r); I_r < 0$$

and saving(s) is influence not only by the rate of interest but also by the rate of growth of the national income (g):

$$S = S(r, g); S_r > 0, S_g > 0.$$

The impact of an interest rate ceiling on savings and investment is shown in Figure 2.1 (Gibson and Tsakalotos, 1994). The savings function is drawn for given rates of economic growth where one assumes that $g_1<g_2<g_3$. If interest rates were not subjected to a ceiling, equilibrium would be at E with interest rate r* and investment and savings equal to I*. Assume initially that the government has imposed a (ceiling1) on nominal interest rates and that this ceiling is such that real deposit rates were below their equilibrium level given by r*. Assume additionally that the rate of economic growth is g_1. At a real deposit rate of r_1, I_1 savings are forthcoming. With the ceiling on deposit rates only, banks can charge whatever interest rate they like on loans. In this case, the interest rate charged will be r_3 with I_1 investments undertaken. The margin which banks make on lending activities is ($r_3 - r_1$).
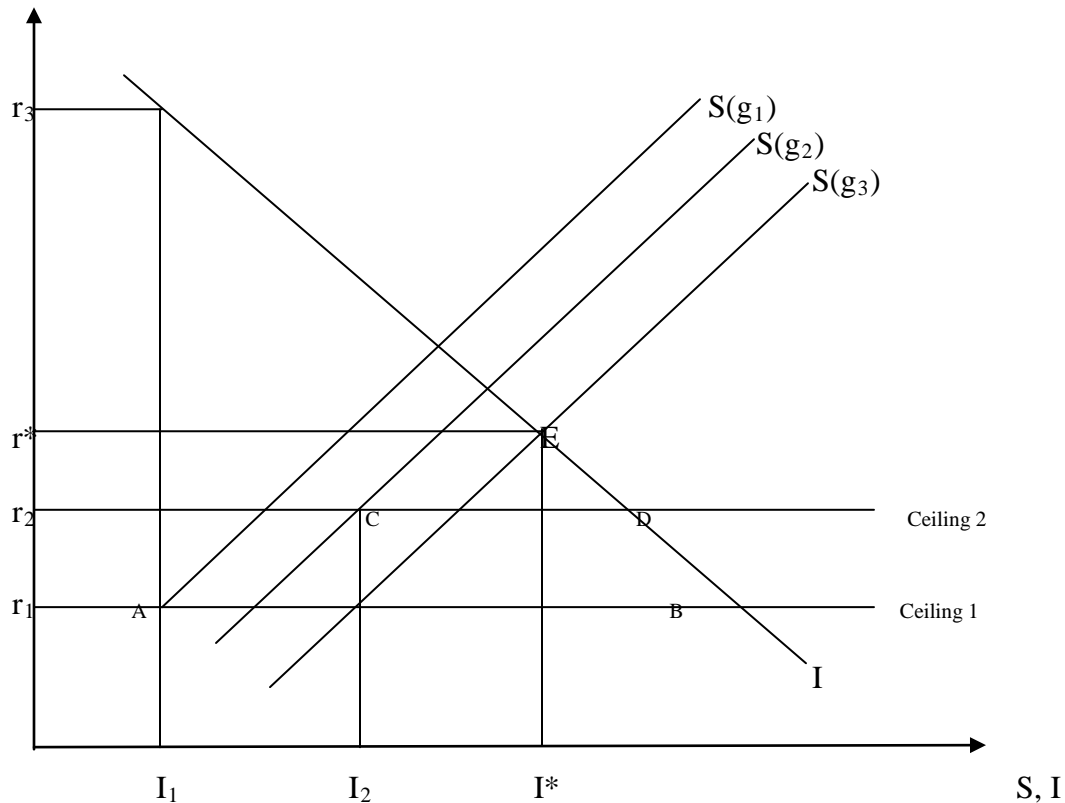
Figure 2.1: The McKinnon-Shaw financial liberalisation hypothesis (Gibson and Tsakalotos, 1994).

McKinnon and Shaw argue that this profit is likely to be used by the banks for non-price competition, for example, branch proliferation and putting up branches in prestigious locations since government regulations usually aim at encouraging investment through the reduction of cost of borrowing, it is more likely that interest rate ceiling will apply to loan rates as well as deposit rates. If ceiling1 applies to both loans and deposit rates, they argue, then I_1 savings are forthcoming and this will allow only I_1 investments to be financed, demand for investment AB is therefore not satisfied. Thus, for instance a large proportion of the unsatisfied investment (AB) is likely to include potentially more profitable projects that were not allocated funds because of their higher risk[8].

The impact of interest rate liberalisation can be seen if one examines what happens when interest rates are raised. Assume the government imposes ceiling2 as initial interest rate liberalisation policy (still below the equilibrium market-determined rate), increased interest rates raise the efficiency of investment, since projects with higher expected rate of return are being undertaking now. The rate of economic growth rises from g_1 to g_2 and the savings function shift to the right. Thus, the new interest rate ceiling at r_2 encourages savings of I_2. There is still credit rationing, but it is now CD. They further their argument with a statement that, it is only when the government fully liberalised the financial sector (interest rates) does the credit rationing disappears and economic growth increases to g_3 for the equilibrium savings and investment at E be achieved (Gibson and Tsakalotos, 1994). Thus, the McKinnon-Shaw hypothesis argues that interest rate ceiling stifles savings by promoting current consumption, reduces the quantity of investment below its optimal level and reduces the quality of investment by encouraging banks to finance only low-return projects and therefore the clear policy implication is the full liberalisation of the financial sector (Gibson and Tsakalotos, 1994).

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[8] Given that there is credit rationing, banks prefer to give available funds to less risky investment. This is called the screening problem in the literature.

Another perspective of the role of finance in economic growth is the Keynesian perspective. Contrary to the McKinnon- Shaw model, this view argues that investment decisions are primarily determined by the level of confidence, expected demand and the "animal spirit" of the private investor. Underlying this view is the fundamental assumption that it is investment that determines savings and not the other way round. Although, the rate of interest matters in principles, it is regarded as being insignificant as compared with expected demand or demand factors. It further argues that high real interest rate may lead to decrease in investments and hence economic growth. Sneessens (1987) and Malinvaud (1980) are of the view that disequilibrium approach in the context of this implies that investment depends on prospective profits and the constraints on firms' revenue. Moreover, it may not be the case that a perfect capital market will lead to an optimal allocation of investments.

As can be seen from figure 2.1, it is only when interest rate is fully liberalised and savings and investments are in equilibrium that there will be an increase in economic growth. This may not be the case as saving may not be identical to investment in most developing countries due to financial underdevelopment and various bottlenecks in the financial system.

2.4   Empirical Literature review

Empirical evidence of the McKinnon-Shaw hypothesis has been shown to have rather mixed results. This may be an indication that interest rate liberalisation policy alone is a necessary but insufficient condition for economic growth and development in developing countries. Most of the evidence of interest rate liberalisation hypothesis seem to suggest a significantly improvement in the quality of investment but not in the quantity of investment and the volume of savings. One thing which seems to come through the available evidence is that in addition to macroeconomic stabilisation, sound and proven regulation of the financial sector seems to play an important role in the successful implementation of the interest rate liberalisation policy.

A review of the existing empirical literature indicates two strains of results about the relation between interest rate liberalisation and economic growth. The first strain is those studies which show that McKinnon and Shaw hypothesis, i.e. interest rate liberalisation, spurs economic

growth and majority of the existing empirical evidence fall in this strain. Some of the authors whose study find in favour of interest rate liberalisation are Roubini and Sala-i-Martin (1992), King and Levine (1993a and 1993b), De Gregorio and Guidotti (1995), Jayaratne and Strahan (1996), Benhabib and Spiegel (2000), Shrestha and Chowdhury (2007) and Odhiambo (2009b), among others. The second strain is those studies which find inconclusive or against the hypothesis that interest rate liberalisation leads to economic growth. Some of the authors whose findings fall in this category are Goldsmith (1969), Mattesini (1996), Odedokun (1996), Luintel and Khan (1999), Deidda and Fattouh (2002), and Ogunmuyiwa and Ekone (2010), among others.

2.4.1 Some empirical evidence in favour of the interest rate liberalisation

There are numerous studies in which results are in favour of interest rate liberalisation hypothesis. For example, Roubini and Sala-i-Martin (1992) used a cross-section data from 98 countries for the period of 1960-1985, which showed that various measures of financial repression affect growth negatively. They also find empirical support for the hypothesis that real interest rates below -5% as well as moderately negative real interest rate are significantly associated with low economics growth rates. They interpret this as an indication that only severe financial repression inhibits growth. In another study, King and Levine (1993a and 1993b) using pooled cross-section time-series data from 77 countries over the 1960-1989 find strong evidence that a large set of financial liberalisation variables including interest rates leads to economic growth, increase in capital accumulation, leads to productivity growth and improvement in investment ratios.

In another study, De Gregorio and Guidotti (1995) pooled cross-section time-series data to investigate the relationship between long-run economic growth and interest rate liberalisation. Applying Barro (1991) type of regression on data sample from 100 countries over 1960-1985, they conclude that there is a strong relation between financial liberalisation and economic growth. Analysis the subsets of their sample data, they find that the impact of interest rate liberalisation increases from rich to poor countries. Furthermore, using six-year averages over 1950 to 1985 on panel data from 12 Latin American countries, they subsequently analysed the

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unregulated financial liberalisation and expectations of government bailouts, paying particularly attention to the period of 1970s and 1980s, they found a reversed relationship between financial liberalisation and economic growth. Based on these results, they recommendation that financial liberalisation requires an appropriate regulatory framework in order to avoid financial crisis. Finally, they provided empirical support for the hypothesis that the main transmission channel from finance to growth is through increasing the efficiency of investment, rather than its volume. The same conclusion was reached by King and Levine (1993a and 1993b).

Furthermore, Ram (1999) using data from four South American and South East Asian countries over the period of 1965 to 1985, applies panel techniques and finds a positive relationship between interest liberalisation and economic growth but for those countries with rapid economic growth rates only. Benhabib and Spiegel (2000) also report that some specific financial sector variables such as the liberalisation of interest rate are associated with specific components of economic development especially, increase in capital accumulation and increase productivity growth. A similar conclusion was reached by King and Levine (1993a and 1993b) as well as De Gregorio and Guidotti (1995). Kendall (2000) evaluates interest rate liberalisation policies in Guyana during 1965-95 to determine its appropriateness and effectiveness on economic growth finds a strong and positive relationship between interest rate liberalisation and economic growth. He concludes that the low efficiency of capital was an issue that needs to be addressed if the maximum impact on economic growth were to be maintained.

Other writers have also used panel data (for example, Seck and El Nil, 1993; Charlier and Oguie, 2002; Allen and Ndikumana, 2000) to investigate the relationship between interest rate liberalisation and economic growth in Africa (Kendall, 2000). Seck and El Nil (1993) and Charlier and Oguie (2002), for instance, find a significant positive relationship between economic growth and the real interest rate liberalisation. Shrestha and Chowdhury (2007) also investigate the financial liberalisation hypothesis using data from the Nepalese economy conclude in favour of the hypothesis. Musitia (2008) analyses the Kenyan economy using panel data for a period of 25 years, i.e. from 1982 to 2006. The author applies policy variables associated to interest rate liberalisation that stimulates economic growth. The results show that among the complimentary policies to interest rate liberalisation, investment in physical capital

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has a greater positive impact on economic growth. In generally, the findings support the fact that financial liberalisation which is associated with higher real interest rates, encourages savings and investment and hence economic growth. The study also predicts and concludes that under the presence of complementary policies, interest rate liberalisation leads to economic growth.

Obamuyi (2009) investigated the relationship between interest rates liberalisation and economic growth in Nigeria. Using time series analysis and annual data from 1970 to 2006, he applied a co-integration and error correction model to capture both the long run and short run dynamics of the variables in the model. He showed that in Nigeria, the real lending rates have significant effects on economic growth. He also showed that exists a long run relationship exists between economic growth and interest rate liberalisation. Furthermore, he concluded that the behaviour of interest rate in a liberalised economy is important for economic growth. In view of this, the study confirmed a positive relationship between interest rates and investment and investment and economic growth and concluded that the formulation and implementation of financial policies that enhance investment friendly rates of interest are necessary for promoting economic growth in Nigeria.

In a recent study, Odhiambo (2009b), using co-integration, error correction models and data from Kenya, finds strong support that interest rate liberalisation leads to economic growth. He puts a caveat, however, that the strength and clarity of its efficacy are sensitive to the level of the dependency ratio. He concludes that interest rate liberalisation leads to economic growth via its influence on financial depth. This he argues applies irrespective of whether the model is static or dynamic. In a similar study on Zambia, Odhiambo (2009c), using co-integration based error correction model, finds a strong relationship interest rate liberalisation and economic growth.

2.4.2 Some empirical evidence which are inconclusive or against interest rate liberalisation

There are various studies which results are inconclusive or are against the financial liberalisation hypothesis. For example, Goldsmith (1969) using sample data from 35 countries over a period from 1860-1963, reports a rough or inconclusive correlation between interest rate liberalisation

and economic growth. In King and Levine (1993c), the authors specifically stated that about one third of the difference between very fast and very slow growing economies can be removed by increasing the depth of the financial intermediation sector.

Bhatia and Khatkhate (1975) using correlation graphs to examine the relationship between economic growth and financial liberalisation (interest rate liberalisation) in eleven African countries find no definite relationship between economic growth and financial liberalisation for the studied countries either individually, or for the whole group. Also, Ogun (1986) using cross sectional analysis on data for 20 countries in Africa from 1969 – 1983 estimates the correlation between interest rate liberalisation and economic growth and finds no support to the economic growth enhancing capabilities of financial liberalisation.

Paul and Dutt (1991) using a Kaleckian model investigated the relationship between interest rate liberalisation, effective demand and economic growth in the Chilean economy find that in Chile, interest rate liberalisation failed to promote stable investments and hence economic growth. They conclude that even though interest rates may lower investment and economic growth by exerting downward pressure on effective demand even if interest rate liberalisation leads to decrease in borrowing cost.

Oshikoya (1992) using time series econometrics on data from 1970 to 1989 to investigate whether interest rate liberalisation has any effect on economic growth in Kenya shows a negative and insignificant coefficient for the real interest rate. However, after dividing the sample into two sub periods of 1970-1979 and 1980-1989 the results show that real interest rate had a negative and significant coefficient between 1970 and 1979, but was positive and significant for the 1980-1989 period. These results offer no robust support for the positive effect of interest rate liberalisation on economic growth.

Also, in a study by Berthélemy and Varoudakis (1995), they explore the relationship between financial liberalisation and economic growth. They based their analysis on convergence club tests which help to check for any potential poverty traps, use sample data from 91 countries between 1960 and 1985. They conclude that educational attainment is a priority factor in respect

of economic development but financial factors such as interest rate liberalisation could lead to high or low economic growth outcomes, in other words convergence groups with similar long run economic growth rates have the same impact from financial liberalisation. They also show that the empirical results also indicate that inadequate financial conditions may severely limit economic growth in countries where they already have sufficient stock of human capital to start a process of economic development from. They concluded that this implies the existence of poverty traps.

In another study, Mattesini (1996) using the spread between lending and deposit as a proxy for the cost of monitoring associated with information asymmetric on data from 40 countries (divided into high and low income) for the period of 1978-1992, shows that the spread is particularly significant in explaining the economic growth for all the countries, but particularly high for countries in the high income bracket. However, for the low income bracket there is no significant relationship between the spread and economic growth. He attributes this to the prevalence of financial repression in the low income countries. This, he argues, may affect the size of the spread. Previous studies by King and Levine (1993c) reached the same conclusion.

In a study by Bandiera et al. (2000), they examine the effects of various financial liberalisation measures in eight selected countries from 1970 to 1994. They found that there was no evidence of a positive relationship between real interest rate on savings. Additionally, they found that in most cases the relationship was negative. Loayza et al. (2000) also documented that the real interest rate had a negative impact on the private savings rate. Using sample data from 150 countries between 1965 and 1994, they found that a 1% increase in the real interest rate decreases the private saving rates by 0.25% in the short run. Reinhart and Tokatlidis (2001), using data samples from 50 countries which consisted of 14 developed and 36 developing countries from 1970 to 1998, found that in the majority of cases higher real interest rates were associated with reduced savings. Also, Morisset (1993) estimates a model for Argentina using time series data from 1961 to 1982. His results, obtained from simulation, indicate that the quantity of private investment was little responsive to movements in interest rates. He argues that the positive effect on the domestic credit market, as suggested by McKinnon (1973) and Shaw (1973), might be offset by the negative effect of a portfolio shift from the capital goods and

public bonds into monetary assets. He further demonstrates that the interest rate liberalisation policy could increase the demand for credit by the public sector, therefore limiting the funds available to the private sector (Shrestha and Chowdhury 2007).

Also, Deidda and Fattouh (2002) conclude that the relationship between interest rate, financial deepening and economic growth are only positive for developed countries. Using data from 119 countries (both developed and less developed) from 1960 to 1989, they explain that in less developed countries the high fixed resource cost associated with the provision of financial services inhibits growth. They therefore conclude that there is a non-linear relationship between financial liberalisation and economic growth. An earlier study by Mattesini (1996) shares the same view.

Hermes and Lensink (2005) investigate the relationship between financial liberalisation on the one hand and saving, investment and economic growth on the other. Using a new dataset for measuring financial liberalisation and a data sample from 25 developing economies over the period from 1973 to 1996, they found no evidence that financial liberalisation affects domestic saving and total investment (although there are some signs to believe that liberalisation may actually reduce rather than increase domestic saving), whereas it is positively associated with private investment, as well as with per capita GDP growth. They found a negative relationship between financial liberalisation and public investment. These results suggest that financial liberalisation leads to a substitution from public to private investment, which may contribute to higher economic growth.

Furthermore, in a recent study, Onaolapo (2008), using data from Nigeria for the period of 1990 to 2006 to evaluate the relationship between financial health variable including interest rate among others and economic growth, found no relationship between the two. However, he found that economic growth leads to improved financial health. Another study, Ogunmuyiwa and Ekone (2010) investigated the impact of money supply and interest rates on economic growth using data from Nigeria for the period 1980 to 2006, which concludes that although money supply and interest rates have positive relationship with economic growth, the relationship is

insignificant in the case of gross domestic product growth rates on the choice between contractionary and expansionary money supply.

2.5   Conclusion

The theory of financial liberalisation (i.e. interest rate liberalisation), as postulated by McKinnon and Shaw (1973), holds, as its ultimate goal, the full interest rate liberalisation of the domestic financial markets. It maintains that it is only financial liberalisation that will accelerate the growth of the real economy. Whereas the critics argue that this will lead to stagflation and therefore the strategy for accelerated growth should be through increased capacity utilisation. However, the speed at which interest rate liberalisation should occur, the way it should be integrated into macroeconomic stabilisation programmes and the prerequisites for its success are still under debate.

The critics, however, argue that household choice of investments include time deposit, loans to business through the informal sector and gold or currency, and that in response to increase in interest rate on deposits, household will substitute these for gold or cash and loans in the informal sector. Furthermore they express the view that the outcome of McKinnon-Kapur depends crucially on one implicit assumption on asset market structure, an assumption that is never stated explicitly: that the portfolio shift into bank deposit is coming out of "unproductive" assets like gold, cash or inventories, and that it is not at all obvious that bank deposit are closer substitutes to cash or gold than to loan extended on the informal sector. They argue that interest rate liberalisation is thus financial crisis and stagflation.

The empirical literature review suggests that country studies and time-series analysis provide mixed results on the relationship between interest rate liberalisation and economic growth than cross-sectional analysis. Also, those studies employing the cross-sectional analysis do generally produce results that are in favour of the hypothesis that interest rate liberalisation leads to economic growth. Furthermore, studies using time-series analysis, however, come to a mixed conclusion, thus, in general, the view that financial liberalisation leads to economic growth in the

earlier stages of economic development and vice versa in the advanced stages of economic development.

Chapter Three

Capital Account Liberalisation and Economic Growth

3.1   Introduction

This chapter is the second of the two chapters of the thesis that focus on the theoretical and empirical literature review of the impact of financial liberalisation on economic growth. In this chapter, the thesis looks at the theoretical and empirical review of the literature on the relationship between capital account liberalisation and economic growth. The chapter is sub-divided into seven sections, including this introduction. In the second section is the review of the origin of capital account liberalisation. Literature on the theoretical arguments in favour of capital account liberalisation is reviewed in section three. In section four, the literature on the theoretical arguments against capital account liberalisation is reviewed. The next section looks at the theoretical linkage between capital account liberalisation and economic growth. Section six presents the review of the empirical literature, whilst section seven provides some concluding remarks.

3.2   Origin of capital account liberalisation

The theory of financial liberalisation since McKinnon (1973) and Shaw (1973) has advanced from focusing on credit markets and the public sector to include the private sector. In most recent studies, the debate has been focused on the dynamics of the liberalisation of debt (bonds) and equity markets and its effect on economic growth in developing countries. The liberalisation of debt and equity markets in a broader sense is called capital account liberalisation (Tswamuno et al., 2007).

In its report on capital account convertibility, the Tarapore Committee of the Reserve Bank of India provides a succinct and subtle definition as follows:

Capital account liberalisation is the freedom to convert local financial assets into foreign financial assets and vice versa at market determined rates of exchange. It is associated with changes of ownership on foreign/domestic financial assets and liabilities and embodies the creation and liquidation of claims on or by the rest of the world. Capital account liberalisation can be, and is, coexistent with restrictions other than on external payments. It also does not preclude the imposition of monetary/fiscal measures relating to foreign exchange transactions, which are of a prudential nature (Reserve Bank of India, 1997).

In the context of this thesis, the above definition of capital account liberalisation will be adopted as it is broad and encompasses all the relevant aspects of the policy. Henry (2006) defines capital account liberalisation as a decision by a country's government to move from a closed capital account regime in which capital may not move freely in and out of the country, to an economy where capital can enter and leave at will. Tswamuno et al. (2007) also refer to capital account liberalisation as a policy by which a government gives foreign investors the right to purchase shares and bonds in the country's markets, at the same time granting domestic investors the right to trade in foreign securities. Cobbam (2001) defines capital account liberalisation as the process of removing restrictions from international transactions related to the movement of capital. It can involve the removal of controls on both domestic residents and international financial transactions, and on investments in the home country by foreign investors. Capital account liberalisation can apply to both inflows and outflows of capital. He is of the view that capital

account restrictions can take various forms, such as limiting domestic banks' foreign borrowing, controlling foreign capital coming into the economy, limiting the sectors of industry in which foreign investors can invest, and restricting the ability of foreign investors to repatriate money earned from investments in the domestic economy.

According to Ghosh (2005), capital account liberalisation typically involves changes in the exchange control regime with full convertibility of the current account transactions accompanying trade liberalisation either prior or simultaneously, which are complemented with varying degrees of convertibility on the capital account. He defines capital account liberalisation measures broadly to cover the following, in increasing degree of intensity, but with a wide variety of patterns of implementation, thus:

- Measures that allow foreign residents to hold domestic financial assets, either in the form of debt or equity. This can be associated with greater freedom for domestic firms to undertake external commercial borrowing, often without government guarantee or even supervision. It can also involve the dilution or removal of controls on the entry of new financial firms, subject to their meeting pre-specified norms with regard to capital investments. This does not necessarily increase competition, because it is usually associated with the freedom to acquire financial firms for domestic and foreign players and extends to permissions provided to foreign institutional investors, pension funds and hedge funds to invest in equity and debt markets, which often triggers a process of consolidation;
- Measures which allow domestic residents to hold foreign financial assets. This is typically seen as a more drastic degree of liberalisation, since it eases the possibility of capital flight by domestic residents in periods of crisis. However, a number of countries that receive "excessive" capital inflows that do not add to domestic investment in the net and are reflected in unnecessary accumulation of foreign-exchange reserves, have turned to such measures as a means of reducing pressure on the exchange rate;
- Measures that allow foreign currency assets to be freely held and traded within the domestic economy (the "dollarisation" of accounts). This is the most extreme form of external financial liberalisation, which has only been implemented in very few countries.

At the beginning of the 1990s there was a substantial increase in private capital flow into developing countries. This remained significant through to the late 1990s with annual flow reaching $100 billion[9]. During this time, the governments and the policy makers in these developing countries became concerned that these large capital inflows could lead to domestic inflation, real exchange rate appreciation or distortion of domestic assets prices.

However, at the beginning of 1997, the trend reversed substantially against the background of a series of capital account crises in some of these developing countries. As a result of these crises, the international community started paying attention to the risk of open capital accounts, and in particular with respect to short term capital flows and the stability as well as the health of the financial markets in these developing countries. Many economists and policy makers began to pay attention to the construction of regulatory environment that would maximise the benefits of access to international savings whilst minimising the likelihood and the cost of financial crises (IMF, 2004).

Consequently, during the 1990s, debates on the relationship between capital account liberalisation and long-term economic growth re-emerged from the literature on endogenous growth. A branch of this school of thought started to focus on whether capital account liberalisation could explain sustained economic growth. The premise of this school of thought is that financial liberalisation has an external effect on aggregate investment efficiency, which in turn offsets the decrease in the marginal product of capital. In line with this argument, the IMF sought to make capital account liberalisation their aim and included this as part of their jurisdiction in 1997. In addition, some economists, for example, Fischer (1998), Summers (2000) and Henry (2006) also made the case for capital account liberalisation. However, Henry (2006), for example, points out that the benefits from capital account liberalisation on economic growth is likely to be short lived unless it is associated with significant productivity growth.

On the other hand, Rodrik (1998) and Stiglitz (2000) argue against capital account liberalisation. Stiglitz (2000), for example, is of the view that capital account liberalisation is mainly derived

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[9] The amount is estimated to be in the region of $200 billion if foreign direct investments were included (IMF, 2004).

from the standard efficiency theory, which employs a conventional neo-classical theory and ignores the special ways that financial and capital markets are different from ordinary goods and services markets. He argues that the supporters of the policy focus on efficiency effects and ignore the distributional effects. Presumably, believing that if the gains from the policy are big enough, the benefits will trickle down to the masses or the government will take active measures that the masses will not be disadvantaged.

A persistent debate among economists has been the relative merits of a more rapid transition to the liberalisation of the capital account, the so-called "big bang" approach, and a more deliberate, gradualist approach that hinges on the reforms in the real economy and financial system and the liberalisation of interest rates before liberalising the capital account. Some advocates of the former position argue that, since resources are lost through obstacles to free capital flows (this is usually related to any protectionist policy), the sooner the capital account is liberalised, better it would be for the economy (see for example, Fischer et al., 1998). The latter view, which is normally the consensus among many economists, stresses the instabilities influenced by financial liberalisation (both interest rate and capital account) before adequate institutional safeguards are put in place. It is therefore seen as advisable to move from reforms in the real sector, improved financial regulation and current account liberalisation before finally liberalising the capital account. However, as pointed out by some economists, although there are legitimate and important concerns about sequencing, there is also a danger that governments can use sequencing arguments to avoid implementation of decisions to which they are not fully committed.

Kapur (1976) implies maintaining control on capital movement until domestic financial liberalisation and when stabilisation policies were completed. The literature has two main concerns. First, it seeks to determine the optimal order for liberalising the domestic real sector, the domestic financial sector, the external sector and the external financial sector. Second, how the order of liberalisation fits into the macroeconomic stabilisation process. Many Economists agree that domestic real sector should first be liberalised, followed by the domestic financial

sector and finally the external sector[10]. If a country decides to liberalise the domestic financial sector before the domestic real sector, credits will flow to the real sector (industries) which are only considered profitable. This is because relative prices are distorted. On the other hand, if it liberalises the domestic financial sector before the external financial sector, then credits will flow to the commerce sector, which is only profitable because of barriers to trade. Thirdly, if the domestic financial sector is not liberalised until trade and commerce, this could hamper the ability of the domestic industries to compete in the world market. Lastly, if external financial liberalisation proceeds before domestic financial liberalisation, interest rates will still be below world levels and this could lead to large amounts of capital flight and also the domestic banks will find it difficult to compete with their foreign counterparts. The general consensus therefore, is that domestic financial liberalisation should come before capital account liberalisation, but after liberalisation of domestic real sector.

3.3   Theoretical arguments in favour of capital account liberalisation

Supporters of capital account liberalisation argue that an increase in international capital inflows resulting from financial liberalisation leads to lower cost of capital, allows for risk diversification, encourages investment in projects with higher returns and ultimately leads to integration into the world financial system and economic growth (Bekaert and Harvey, 1995). According to Henry (2006), in broad terms, there are two opposing views about the wisdom of capital account liberalisation as a policy choice for developing countries. The first view is Allocation Efficiency. This, he points out, depends heavily on the predictions of the standard neo-classical economic growth model pioneered by Solow (1956). In the neo-classical model, liberalising the capital account facilitates a more efficient international allocation of resources and produces some positive effects on the economy and hence economic growth. Thus, in theory, resources flow from capital abundant countries where the return on capital is low, to capital scarce countries where the return on capital is high. The flow of resources into the capital scarce countries reduces their cost of capital, triggering a temporary increase in investment and growth that permanently raises their standard of living (Fischer, 1998; Fischer, 2003; Obstfeld 1998;

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[10] See for example Balassa (1990); Edwards (1984); Arriazu (1983), Edwards and Khan (1985); McKinnon (1973), Gibson and Tsakalotos (1994) and Gelbis (1977).

Rogoff 1999; and Summers, 2000). As a result of the envisaged prospective gains from incorporating allocation efficiency arguments into their economic policies, several developing countries including ECOWAS countries have implemented some form of capital account liberalisation policies. On the other hand, allocation efficiency is an attempt to extend the results of the gains from international trade in goods to international trade in assets. The predictions therefore hold only where there are no distortions to the economy other than barriers to free capital flows. Critics argue that the theoretical predictions of the neoclassical model bear little resemblance to the reality of capital account policy.

Also, the theory of the international asset pricing model predicts that capital account liberalisation will lead to a drop in the cost of equity and debt capital through integration of segmented markets, which will ultimately lead to economic growth. Integration is achieved when global assets of identical or similar risks command the same expected return regardless of where they are traded. Bekaert and Harvey (1995) show that if isolated countries were to liberalise, then capital flows across borders would equate the price of risk across all the markets, eliminating differential risk. Henry (2006) further argues that if a developing country opens its stock market to foreign investors, aggregate dividend yield falls and growth rate of output increases leading to growth rate of output per worker thus increases economic growth. Levine and Zervos (1996) show that capital account liberalisation results in an increase in stock market liquidity. Increased liquidity leads to further development of the underlying market as investors are assured of getting in and out of a position without much difficulty.

Prasad and Rajan (2008) argue that the benefits that are derived from capital account liberalisation depend on the level of institutional and economic development before the policy is implemented. These include property rights and the judicial systems. For example, they point out that if property rights are not protected and the judiciary is very weak, there may be very little that foreign investors can do to improve corporate government. Furthermore, they argue that it is only when a certain threshold level of these institutions is reached that arms and length foreign investors can press for better governance. They hold that it may also be that only when a country is more advanced and closed to the technological frontiers can it use the full capabilities that foreign financial know-how brings, such as the ability to discriminate between alternative sets of

investments opportunities. When a country is very poor, the investments that are needed may be much more obvious, provided appropriate protections are in place (Prasad and Rajan, 2008).

Rajan and Tokatlidis (2005) and other authors, further argue that below the threshold, capital account liberalisation could be detrimental to the economy. This is because foreign investors are mostly seen as arm's length investors who will cut and run at the first sign of instability. In such circumstances, a country with inadequate regime to deal with corporate insolvencies could be destabilised very badly by fleeing foreign investors closing their firms down. They hold that such inability to solve internal fiscal conflicts is likely to have more fragile foreign debt. In contrast, the very nature of the engagement of foreign investors may change in such a situation and could lead to improvements in the countries institutional quality[11]. Faria and Mauro (2004) suggest that better institutional quality could swing a developing country's foreign inflows towards foreign direct investment and portfolio equity flows, which are not only less risky than debt flows, but could also lead to more foreign involvement in corporate governance and technological transfer.

Bekaert et al. (2005) also show that foreign investors pressure local institutions to adhere to international standards, which improves local corporate governance and reduces the division between internal and external finance. In a nutshell, according to Martell and Stulz (2003), capital account liberalisation in developing countries is equivalent to an initial public offer (IPO) which boosts access to capital and allows for convergence of cost of capital between developed and developing countries. Mishkin (2006) for instance, holds that international financial flows serve as an important engine for domestic financial market development. This, he said, is reflected in both straightforward measures of the size of the banking sector and equity markets, as well as wider concept of financial market development, including supervision and regulations. It is also argued that the presence of foreign banks is linked to improvements in the quality of banking and financial services and efficiency of financial intermediation and likewise, capital account liberalisation tends to lead to larger and more liquid equity markets (Levine and Zervos, 1998; Claessens et al., 2001; Levine, 2001; Clarke et al., 2003; Claessens and Laeven, 2004; Schmukler, 2004). Furthermore, employing various panel techniques Levine et al. (2000a and

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[11] This is a term that encompasses quality of corporate and public governance, the legal framework, government transparency and level of corruption.

2000b) and Beck and Levine (2004), among others, show that improvements in financial liquidity are followed by higher economic growth (Papaioannou, 2007)

3.4   Theoretical arguments against capital account liberalisation

Opponents of capital account liberalisation argue that it increases the risk of speculative attacks and increases a country's exposure to international shocks and capital flight and hence jeopardises its economic growth. According to Gridlow (2001) the principal of the South African Reserve Bank College "Developing countries in the 1980s and early 1990s had been led to believe that foreign investment in the form of equities and bonds traded on the local markets was more long-term in nature than the foreign bank lending they attracted in the 1970s. However, huge flight of capital from the emerging markets, at times, in recent years has exploded that myth." Stiglitz et al. (1994) argue that information asymmetries, which are especially endemic to financial markets and transactions in developing countries, can be detrimental to capital account liberalisation. They further contend that compared to their developed counterparts, markets in developing countries do not have the capability to assemble information relevant to financial transactions and thus cannot guarantee that capital will flow where its marginal productivity exceeds opportunity cost. Even though Stiglitz et al. (1994) are merely worried about the effects of information asymmetry on capital account liberalisation, they point out one of the significant limitations to the neo-classical model proposed by Solow (1956), Henry (2006) and others.

Several other economists also suggest that there are numerous conditions, not yet met by most developing countries, which are necessary to ensure the success of capital account liberalisation. Aghion, Bacchetta, and Banarjee (2000) developed a mathematical model to show that economies at an intermediate level of financial system development are more susceptible to macroeconomic shocks. In their model, full financial liberalisation, i.e. both interest rate liberalisation and capital account liberalisation, in such economies may lead to destabilisation, characterised by permanent phases of economic growth and capital flight. Rodrik and Velasco (1999) argue that openness to international capital flows can harm a country if appropriate controls, coupled with a strong macroeconomic and regulatory environment, are not in place.

Johnston (1997) argues that governments should develop strong institutions for monetary policy and exchange rate management before liberalising the capital account.

Arestis (2005a) argues that capital account liberalisation could induce two types of speculative pressures: expectations-induced and competition-coerced, both of which contribute to the increased presence of short-term, high-risk speculative transactions in the economy and to the increased vulnerability to financial crises. The first of these comes from expectations-induced pressures to pursue speculative transactions in view of the freedom created by the liberalisation policy. Given the proliferation of speculative opportunities, this freedom rewards those speculators who have short-time horizons and punish the investors with a long-term view. The competition-coerced type of pressures comes from the pressures on non-financial corporations who may feel compelled to enter the financial markets in view of higher returns, induced by the capital account liberalisation, by borrowing to finance short-term financial speculation. A critical manifestation of this possibility is increasing borrowing to finance short-term financial speculation. Lenders in turn may feel compelled to provide this type of finance, essentially because of fear of loss of market share (Minsky, 1986).

As Grabel (1995) puts it, one undesirable implication of these types of pressures is that economies are forced to bear a greater degree of `ambient' risk and thus uncertainty with financial liberalisation than without it. Federer (1993) also notes that capital account liberalisation may lead to a reduced volume of real sector investment, while exerting upward pressures on interest rates despite the higher risk. These stock market speculations and developments represent a source of macroeconomic instability in that stock market financial assets are highly liquid and volatile, thus making the financial system more fragile and consequently, encouraging short-termism at the cost of long-term growth (Arestis et al., 2001). Capital account liberalisation, therefore, is less likely to enhance the long-term growth prospects, especially of developing countries. Additionally, dependence on the external inflows, which have produced the stock market expansion, particularly in developing countries, erodes policy autonomy, and, in the case of a fixed exchange rate policy, it forces monetary authorities to maintain high interest rates to sustain investor confidence and greed. There is also the argument that capital account liberalisation may lead to a reduction in the rate of return as a result of

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increased capital flows, which reduces the domestic saving rate. Domestic institutions may face greater competition from foreign institutions, which may cause excessive pressure on domestic institutions and eventually to their bankruptcy (Weller, 2001)[12].

Furthermore, Weller (2001) argues that the composition of capital inflows is a key determinant of their susceptibility to sudden reversal and their beneficial impact upon the recipient country. The authorities must thus be aware of the composition of inflows and be prepared to limit exposure to more volatile classes of capital. These can be examined along six dimensions - cost, conditionality, risk-bearing properties, transfer of intellectual property, their impact on investment and their vulnerability to sudden reversals. Some economists describe an evolutionary process through which an economy moves from attracting only inflows of official finance and foreign direct investment in natural resources, through to inflows of foreign direct investment in non-resource extracting sectors and bank finance, to later stages of development in which it attracts portfolio equity and bonds, and in which its companies can list their shares on developed countries' stock markets (see for example, Solow, 1956; Hall and Jones, 1999). If one considers these as the developmental stages of capital account liberalisation, then it can be seen that most ECOWAS countries are at present, in the first stage of their financial system development. Moreover, it is believed that productivity rather than just accumulation of inputs determines a long-term growth (see also Solow, 1956; Hall and Jones, 1999).

Gourinchas and Jeanne (2006) used calibrations of a parameterised general equilibrium model to argue that the effects on economic growth after capital account liberalisation are likely to be small because productivity growth, rather than increase in capital inflow, determines long-term growth. Again, the vulnerability and fragility of financial systems in many developing countries and the negative properties of short-term flows means that these countries must take a pragmatic stance towards capital controls. One can distinguish between controls that hinder efficient international financial intermediation and those that can be viewed as prudential controls designed to contain the potential risks of international capital flows. In the transitional period towards a more open capital account, controls may play a role in insulating the economy from

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[12] A relevant study is that of Weller (2001), who concludes that in a number of countries there was a widening gap between credit expansion and industrial expansion after financial liberalisation; a result that he interpreted as an indication of more speculative financing.

volatile capital flows or allowing time for the strengthening of financial market institutions and other initial conditions.

Kose et al. (2006) argue that it is necessary for countries to retain the right to impose controls on capital outflows during a financial crisis. However, some economists argue that controls are no substitute for a sound macroeconomic policy and strong institutional fundamentals and should not be seen as a substitute for reform. They argue that good macroeconomic policy is both a requirement and an outcome of liberalisation, and capital account liberalisation can discipline macroeconomic policy. The difficulty is that it requires efficient capital markets.

On the other hand, Rajan and Zingales (2003) and Stulz (2005) show that capital account liberalisation can expose a country's financial sector to competition, which will lead to improvements in the domestic corporate governance because the foreign investors will demand the same standard that exists in their countries of origin, hence imposing discipline on macroeconomic policies and the domestic government in general. Capital inflow and outflow resulting from capital account liberalisation may therefore create "collateral benefits" in the recipient county, which could enhance growth in total factor productivity.

3.5 Capital account liberalisation and economic growth – A theoretical linkage

Henry (2006) analyses the fundamental predictions of the neo-classical economic growth model about the impact of capital account liberalisation on a developing country as follows. The reproduced Henry (2006) model below, assumes that output is produced using capital and labour, in a Cobb-Douglas production function with labour augmenting technological progress:

$$Y = F(K,AL) = K^{\alpha} + AL^{1-\alpha} \qquad (3.1)$$

Let k = K/AL be the amount of capital per unit of effective labour and y= Y/AL the amount of output per unit of effective labour (Henry, 2006). Using this notation and the homogeneity of the production function we have:

$$y = f(k) = k^\alpha \qquad\qquad (3.2)$$

Let's denote the fraction of national income that is saved each period and assume that capital depreciates at the rate δ, the labour force grows at the rate n, and total factor productivity grows at the rate g. Saving each period builds up the national capital stock and helps to make capital more abundant. Depreciation, a growing population, and rising total factor productivity, all work in the other direction, making capital less abundant (Henry, 2006). The following equation summarises the net effect of all these forces on the evolution of capital per unit of effective labour:

$$k^\alpha(t) = sf(k(t)) - (n + g + \delta)k(t) \qquad\qquad (3.3)$$

Output per unit
of effective labour
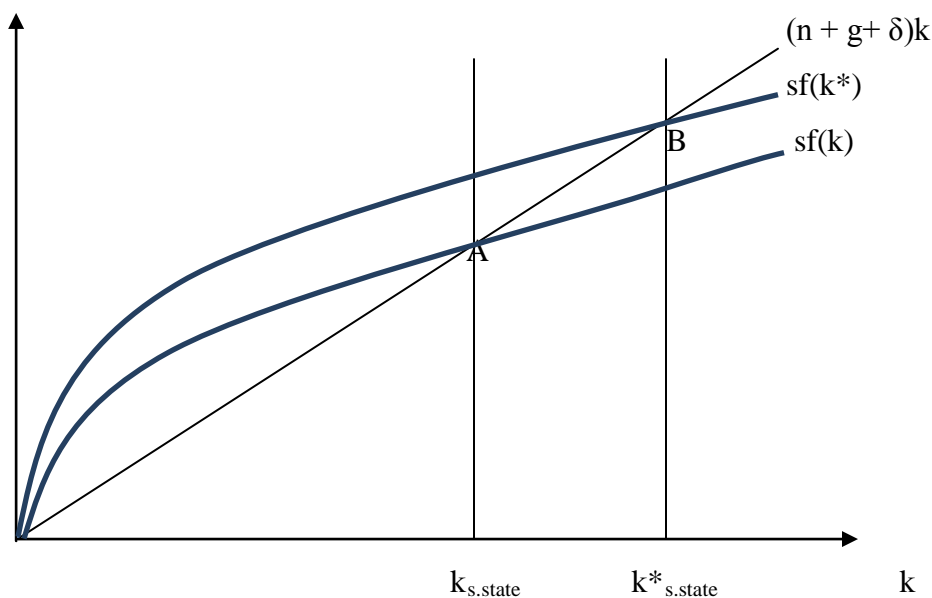
Figure 3.1: Capital account liberalisation in the neoclassical growth model (Henry, 2006)

When $k^{\alpha}(t) = 0$, the economy is in the steady state as shown by point A in figure 3.1. At this point, the ratio of capital to effective labour (k) is constant. In contrast, the steady-state level of capital (K) is not constant, but growing at the rate n + g. Output per worker (Y/L) grows at the rate g.

Finally, the steady state marginal product of capital equals the interest rate plus the depreciation rate:

$$f'(k_{s.state}) = r + \delta \tag{3.4}$$

Equation (3.4) gives a general expression of the equilibrium condition for investment (Henry, 2006). This equation has important implications for the dynamics of a country's investment and growth in the aftermath of capital account liberalisation, because the impact of liberalisation works through the cost of capital. Let r* denote the exogenously given world interest rate. The standard assumption in the literature is that r* is less than r, because the rest of the world has more capital per unit of effective labour than in developing countries, especially those in the West African sub-region. It is also standard to assume that the capital markets in developing countries are small, which means that each particular developing country cannot influence world prices.

Under these assumptions, when a developing country liberalises the capital account, capital surges in to exploit the difference between the world interest rate and the country's rate of return to capital (Henry, 2006). The absence of any frictions in the model means that the country's ratio of capital to effective labour jumps immediately to its post-liberalisation, steady state level. Figure 3.1 depicts this jump as a rightward shift from $k_{s.state}$ to $k^*_{s.state}$. In this steady state, the marginal product of capital is equal to the world interest rate, plus the rate of currency depreciation:

$$f'(k^*_{s.state}) = r^* + \delta \tag{3.5}$$

The instantaneous jump to a new steady state (point B on Figure 3.1) is an unattractive feature of the model, because it implies that the country installs capital at the speed of light, but this is not the case in practice. There are a variety of formal ways to slow down the speed of transition, but taking the time to do so here would lead us astray (Barro and Sala-i-Martin, 1995)[13].

According to Henry (2006), the vital fact about the transition dynamics, which would hold true in any model, is that there must be a period of time during which the capital stock grows faster than it does before or after the transition. To see why the growth rate of the capital stock must increase temporarily, recall that in the pre capital account liberalisation steady state, the ratio of capital to effective labour ($k_{s.state}$) is constant, and the stock of capital (K) grows at the rate $n + g$. In the post-liberalisation steady state, the ratio of capital to effective labour ($k^*_{s.state}$) is also constant and the capital stock once again grows at the rate $n + g$. However, because $k^*_{s.state} > k_{s.state}$, it follows that at some point during the transition, the growth rate of K must exceed $n + g$.

The temporary increase in the growth rate of capital has implications for economic growth, because the growth rate of output per worker is given by the formula $\gamma_{Y/L} = \alpha(k^\alpha/k) + g$. Since the growth rate of K exceeds $n + g$ at some point during the transition, k^α/k must be greater than zero during the corresponding interval of time. Therefore, the growth rate of output per worker also increases temporarily (Henry, 2006).

Another theory, the theory of international asset pricing model, predicts that capital account liberalisation will lead to a drop in the cost of equity and debt capital through integration of segmented markets. Integration is achieved when global assets of identical or similar risk command the same expected return regardless of where they are traded. Bekaert and Harvey (1995) show that if isolated countries were to liberalise, then capital flows across borders would equate the price of risk across all the markets, eliminating differential risk. Henry (2006) further argues that if a developing country opens its stock market to foreign investors, aggregate dividend yield falls and growth rate of output increases leading growth rate of output per worker. Levine and Zervos (1996) show that liberalisation results in an increase in stock market liquidity.

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[13] See in particular Chapter 2 of Barro and Sala-i-Martin (1995).

Increased liquidity leads to further development of the underlying market as investors are assured of getting in and out of a position without much difficulty.

3.6   Empirical literature review

There are a number of empirical studies which specifically investigate the impact of capital account liberalisation on economic growth. One such study is that of Atje and Jovanovic (1993). Using data on banking variables from 94 developed and developing countries, and data on stock market variables from 40 developed and developing countries between the period of 1966 and 1988, they tested the relationship between financial liberalisation and economic growth. They proposed two proxies of financial liberalisation, one measuring bank intermediation and the other approximating stock market activity. They concluded that only stock market activity has a strong relationship with economic growth, furthermore, they found no evidence for level effects and hence conclude that improvement in stock markets activities leads to long run growth in per capita GDP. However, Harris (1997) using the same proxies on data from 49 developed and developing countries between the period of 1980 and 1991 concludes that stock market activities have, at best, a weak relationship   between financial liberalisation and long run economic growth.

Harris (1997) was a direct response to Atje and Jovanovic (1993) and criticises their methodology and approach. In contrast to Atje and Jovanovic (1993), Harris (1997) specifies a regression equation with current instead of lagged investment figures. He multiplies the initial level of stock market activities (i.e. value traded) with lagged investment figures then enters the investment figures as a separate variable. However, Atje and Jovanovic (1993) wanted to account for endogeneity of the variables as well. Harris (1997) uses the same econometric model as that of Atje and Jovanovic (1993) but essentially for a different time period. He argues that the approach employed by Atje and Jovanovic (1973) is not appropriate because past and current investments are not sufficiently correlated with each other. Rather, he proposes the use of instruments to account for the endogeneity of current investment. The effect of stock markets on economic growth, he concludes, is therefore much weaker. He further divided the data into developed and developing countries, he concludes that in the selected developing countries stock

markets do not seem to have a positive effect on long run economic growth, whereas in the developed countries, they do.

In another study, Levine and Zervos (1998) use cross-section data from 47 countries for the period of 1976 to 1993 to investigate the impact of stock market activity on economic growth, capital stock growth, productivity growth, as well as private savings rate. They report a strong positive relationship between stock market liquidity (as measured by initial value traded as a ratio of GDP plus initial turnover ratio - i.e. value traded as a ratio of average market capitalisation), real GDP growth, capital stock growth and productivity growth. They also find that other financial variables such as stock market size, volatility and integration into the international capital markets are not strongly linked to economic growth. Furthermore, using stock market liquidity and financial deepening (as measured by bank credits to the private sector as a ratio of GDP) in their model simultaneously showed a positive relationship with economic growth. They argue that this is an indication banks and stock markets provide different financial services in an economy.

Klein and Olivier (2000) estimate statistically significant and economically relevant effects of capital account liberalisation on financial depth and economic growth in 33 developed and developing countries. Using cross section data from 1986 to 1995, they show that in countries where the capital account is liberalised, there is a positive relationship between capital account liberalisation and economic growth than in those countries where capital account restrictions still exist. They find that out of the countries which have liberalised their capital account, the relationship between capital account liberalisation and economic growth is insignificant among the developing countries. They therefore conclude that there are potentially important policy implications regarding the desirability of liberalising the capital account.

Rousseau and Wachtel (2000) also confirm the findings of Levine and Zervos (1998). Using cross-section data from 47 countries for the period of 1980 to 1995, they allow for potential endogeneity between economic growth and financial liberalisation by applying a two-stage least squares regression approach. They find that there is an impact of value traded on economic growth. However, they find no impact of volume of market capitalisation and market

capitalisation as a ratio of GDP) on economic growth. In addition, they show that the value traded indicator turns out to be particularly significant. Finally, they point out that the deflation of the stock market indicators by a general price index like inflation indices overestimate the effect of market capitalisation on economic growth. They therefore argue that a share price index should rather be used to adjust the stock market indicators, because asset price increases may overstate actual market size.

On the other hand, Arestis, Demetriades, and Luintel (2001) using time-series analysis and data from five developed countries for the period of 1968 to 1998, investigate the relationship between indicators like stock market capitalisation as ratio of GDP and volatility and economic growth for all five countries. But for two of the countries, they included such indicators as value traded as a ratio of GDP and turnover ratio. They report that stock market development has a significant impact on economic growth in three of the countries. For two of the countries, they report that the effect of stock market development, however, is weaker than the impact of banking development on economic growth. Furthermore, for two of the countries, they show that the connection between financial liberalisation and economic growth is not very strong.

Boamah et al. (2005) empirically examine whether capital account liberalisation stimulates higher capital and financial inflows and hence economic growth in Caribbean countries. Using annual time series data from Barbados, Guyana, Jamaica, Trinidad and Tobago, and ARDL co-integration methodology, they do not find definitive support to the hypothesis that liberalising the capital account leads to increased private capital inflows and hence economic growth. However, they provide some evidence that capital flows are significant in explaining the movements in private investment.

In another study, Bonfiglioli (2005) assesses the effects of international liberalisation on economic growth. Using sample data from 93 countries from 1975 to 1999, she provides empirical evidence that capital account liberalisation spurs economic growth through productivity growth. She concludes that there is evidence of conditional convergence on productivity across the countries sampled. She, however, points out that the speed of convergence is not affected by the capital account liberalisation policy.

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Bashar and Khan (2007) evaluate the impact of liberalisation on the economic growth in Bangladesh by analysing time series data from 1974 to 2002 using co-integration and error correction methods. The results suggest that long run economic growth in Bangladesh is largely explained by physical capital and real interest rate, and that economic growth remains unaffected by short term changes in labour force and secondary enrolment ratio. They conclude that the reason financial liberalisation has had a significant negative impact on economic growth is that financial reforms failed to attract new investment due to adverse investment climate. Furthermore, they point out the effects of capital account liberalisation were rather insignificant. This was possibly due to the weak supply response and lack of credibility of such liberalisation programs.

In some empirical evidence from Africa, Tswamuno et al. (2007), for example, use data from South Africa to study the relationship between capital account liberalisation and economic growth and conclude that the equity and bond markets do not stimulate economic growth. Another study conducted by Onaolapo (2008) agreed with Tswamuno et al. (2007). Using data from Nigeria for the period of 1990 to 2006, Onaolapo (2008) conducted a causality test and concluded that while economic growth led to increase in market capitalisation, the reverse is not true. Also, Naceur, Ghazouani and Omran (2008), using panel data from 11 Middle East and North African (MENA) countries between 1979 and 2005, found that stock market liberalisation did not lead to economic growth in the MENA region. However, they found that a long-term positive relationship between stock market liberalisation and economic growth existed. A similar conclusion was also reached by Shahbaz et al. (2008).

Shahbaz, et al. (2008) investigating whether there is a relationship between stock market development and economic growth, used data from Pakistan for the period of 1971 to 2006 and find that there is a very strong relationship between stock market liberalisation and economic growth. Furthermore, using Engle-Granger causality estimations, they confirm the existence of long run bi-directional causality between stock market development and economic growth. In the short run, however, they find the existence of one way causality running from stock market development to economic growth.

Quinn and Toyoda (2008) test whether capital account liberalisation leads to economic growth using pooled time series data from 93 developed and developing countries from 1950 to 2004. They find that capital account liberalisation is positively associated with economic growth in both the developed and the developing countries. Employing cross sectional OLS and the system of GMM estimators, they conclude that equity markets liberalisation has an independence effect on economic growth.

Carmignani (2008), employing a three-equations empirical representation of the channels linking capital account liberalisation and economic growth on a sample data from 79 countries over the period 1970 to 2000, estimates that capital account liberalisation leads to economic growth through financial development and openness to trade. He concludes that the residual effect of capital account liberalisation on economic growth, after accounting for these two channels, is negligible. Based on these results, he calls for a reconsideration of the conclusions on the economic growth effect of capital account liberalisation drawn from single-equation empirical models.

3.7   Conclusion

The theory of capital account liberalisation as discussed above suggests that investment will flow across country borders from capital abundant countries into countries with relatively lesser capital as these countries are constrained by low levels of domestic savings. This, it postulates, will lead to economic growth in the recipient countries given the appropriate macroeconomic conditions and the requisite stability or threshold as suggested by some economists. It maintains that capital account liberalisation will lead to lower cost of capital, allow for risk diversification, encourage investment in projects with higher returns and ultimately lead to integration into the world financial system. Whereas the critics argue that this will increase the risk of speculative attacks and also increases a country's exposure to international shocks and capital flight.

It is also clear that, for a successful capital account liberalisation policy, a plethora of factors such as the appropriate institutional development, requisite supervision and regulatory regime,

the stage of development of the financial system, the threshold conditions (i.e. the stage of the country's development) and other macroeconomic conditions must be critically examined before the implementation of the policy.

One can argue that in moving towards capital account liberalisation, governments must also ensure that inflation, the current account balance and foreign exchange reserves are maintained at acceptable levels. Any one of these variables can prompt a financial crisis if it is allowed to move seriously out of line and undermine confidence in the domestic currency leading to hyperinflation. The inflation objective can be aided by the creation of a strong, independent central bank that is relatively insulated from more populist pressures emanating from the political process. Maintaining adequate foreign exchange reserves becomes less pressing if floating rates are adopted, but it is important for the central bank to have funds to intervene in the market to promote stability and reduce volatility and also to provide psychological reassurance to foreign investors.

It is clear that before capital account liberalisation is implemented, it is important to put in place financial sector reform, prudential norms and effective regulatory supervision. These are the areas that are mostly deficient in many developing countries. Unfortunately, capital account liberalisation in several developing countries has made the situation worse, since it has led some countries to retreat from effective regulatory oversight, information gathering and the enforcement of prudential norms for fear that they will be seen as the first step in a return to state control. However, as numerous crises have made clear, in an environment of liberalised capital flows, weaknesses in the financial system can cause great macroeconomic instability and crises. A well regulated financial system is no guarantee that a crisis would not occur, but it would certainly reduce the incidence and extent of the crisis. The choice is therefore between a careful reform of the financial system before or during the process of liberalisation, and emergency reforms after a crisis. The inexperience of many participants in the financial sectors in developing countries can lead to over exposure to interest rate and exchange rate risks. Thus, the authorities' ability to develop prudential regulations and then create the information and enforcement systems to support them are central to financial sector reforms.

The empirical literature summarised above has addressed the issue from the stand point of the effect of capital account liberalisation on economic growth. Unfortunately, the debate remains unresolved as the empirical evidence is inconclusive. This is because the available evidence inherently involves a joint test of the impact of capital account liberalisation on economic growth and the particular method of quantifying the degree of financial liberalisation[14]. For example, while Levine and Zervos (1998), Rousseau and Wachtel (2000), Arestis, Demetriades, and Luintel (2001) and Shahbaz, et al. (2008), find a positive relationship between capital account liberalisation and economic growth, Harris (1997), Tswamuno et al. (2007), Onaolapo (2008) and Naceur, Ghazouani and Omran (2008) fail to find the existence of such a relationship.

Chapter Four

Financial Liberalisation in Ghana

4.1   Introduction

This chapter is the first of three chapters that focus on the financial liberalisation policies as implemented in Ghana, Nigeria and Ivory Coast. The experiences of these countries' financial liberalisation policies serve as a basis for the empirical investigation presented in chapters seven and eight. The chapter is sub-divided into eight sections. The second section deals with the origins of financial repression and liberalisation in Ghana. The third section is a discussion of the origin of interest rate liberalisation in Ghana, whilst the section after that looks at the trends of the interest rates and financial savings in Ghana before and after financial liberalisation. Section five looks at the challenges posed by interest rate liberalisation in the Ghanaian economy. This section also looks at financial development such as financial deepening and investment. It also investigates the influence of interest rate liberalisation on the sectoral allocation of credit in the Ghanaian economy, as well as trends of financial depth, interest rates, interest rate spread and economic growth before and after financial liberalisation together with the prevalence of foreign

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[14] This is a common problem in empirical studies in the area of financial liberalisation i.e. the disentanglement of the effect of financial liberalisation from other macroeconomic and international environmental effects.

currency deposits in the domestic banks. In section six, the origin of capital markets in Ghana, trends of capital account liberalisation and economic growth before and after financial liberalisation are analysed, and also current developments in the Ghanaian stock market as well as challenges of the capital market are presented. Section seven presents a chronology of financial policy reforms that have been implemented since 1983, whilst in section eight, some concluding remarks are presented.

4.2   The Origins of Financial liberalisation in Ghana

Since independence in 1957 to the year 1983, Ghana has pursued a growth strategy policy which can be described as based on inward-oriented trade policy led by the public sector and aimed at the achievement of social welfare objectives (Aryeetey, 1994). As a result, the budgetary pressures and the fast depleting external reserves which led to shortages in the Ghanaian economy in the 1960s forced the introduction of price control policies for the administrative allocation of scarce goods and services. This extended to the financial services as well. By mid 1960s, the price control regime became official with the establishment of the Price and Income Board. In the financial sector, banks were forced to provide credit based on social and political considerations and to make sure that these credits are channelled into priority sectors, for example, agriculture. In order to cope with the cost, credit, exchange rate and interest rates were fixed by the government. The price control regime instigated distortions in the market that led to the misallocation of resources (Aryeetey, 1994). Economic growth rates declined as a result of price distortions which affected the production of the real sector of the economy. The control of the foreign exchange market led to the over-valuation of the domestic currency and hence weakened the export sector at the expense of an increased appetite for foreign goods, thus worsening the balance of payments. According to Sowa and Acquaye (1999), the controls of interest rates together with the high rate of inflation brought about a system of financial repression which weakened the development of the financial sector and subjected the allocation of credit to political patronage.

An integral part of this inward-oriented policy strategy was the control the government had over the financial sector. There were interest rate ceilings both on deposits and credits, and there was

no stock market. Government policies favoured the mobilisation of savings and allocation of credits through government owned financial institutions (Bank of Ghana, 1988). Despite this policy favouritism, domestic savings mobilisation by the Banks was unsatisfactory. For instance, between 1969 and 1986, financial deepening in Ghana, as measured by the ratio of M2 to GDP, averaged 17.3 % (see Figure 4.1). This poor performance could be attributed to: (i) citizens lack of confidence in the financial sector during that period; (ii) low deposit interest rates (fixed by the government); and (iii) the emergence of large-scale migration of Ghanaian workers, especially to Nigeria and Libya for "greener pastures".

Related to the latter is the emergence of the problem of currency substitution in Ghana, which was closely associated with the phenomenon of "brief-case" transfer of remittances by Ghanaians working abroad. This practice was encouraged by the macroeconomic imbalances and the inadequacy and imperfection of the prevailing official exchange rates, leading to the growth of a large and sophisticated black market for foreign exchange. Alongside this phenomenon, the economy developed a large underground economy covering a wide range of activities including black market dealings in rationed food and subsidised commodities. Thus, food and some "essential" commodities were distributed through what were known as "Logistics Shops" between 1976 and 1981 and later between 1982 and 1986 through "Peoples' Shops".

Although it is difficult to ascertain or determine the magnitude of such activities, the proportion of narrow money (M1) held as currency (outside Banks) might be an indication of this (Serieux, 1993 and Shaw, 1973). For example, the average ratio of currency outside banks to M1 between 1969 and 1986 averaged 53.1%. This may suggest how large the black and underground markets were during the pre-financial liberalisation era. All these led to economic meltdown. The country was forced to implement an Economic Recovery Programme (ERP) in 1983. This included macroeconomic stabilisation and institutional reforms aimed at the liberalisation of prices. The price control regime was abolished and the process of interest rate liberalisation and that of capital accounts liberalisation were vigorously pursued.

The various measures enforced by the Ghanaian government before the financial liberalisation included:

- ✓ Promulgation of a new banking law.
- ✓ Strengthening of the banking supervision arm of the Central Bank.
- ✓ establishment of a flexible exchange rate regime leading to opening of forex bureaux and
- ✓ Removal of subsidies and trade barriers.

all in the framework of the Economic Recovery Programme (ERP) which started in 1983.

4.3   The origins of interest rate Liberalisation in Ghana

Beginning 1986, within the context of the Economic Recovery Programme (ERP) which began in 1983, the Government of Ghana, The Central Bank of Ghana in conjunction with the World Bank/IMF launched a financial liberalisation package to liberalise interest rates, decontrol and unify the foreign exchange systems[15], organise a market for Treasury Bills, privatise government owned banks and ultimately, establish a capital market. As a result, the interest rate ceiling was completely deregulated in order to allow the interplay of market forces to determine their levels. The deregulation of the exchange rate regime resulted in the opening of forex bureaux throughout the country. The balance sheets of the banks were cleansed with all the non-performing assets transferred to a special institution formed purposely to retrieve these assets from the debtors. In place of these assets were issued the Financial Sector Adjustment Programme (FINSAP) bonds. Furthermore, the Banking Supervision arm of the Central Bank was strengthened and restructured to meet the tasks ahead (Bank of Ghana, 1988).

With regards to credit policy, a gradual approach was adopted. With the exception of the agricultural sector, for which a floor of 20% of the total lending was specified, no limits were specified on lending to the other sectors (Annual financial reports, Bank of Ghana, 1988). In addition to these, the central government's budget deficit was reduced from 2.2% of GDP in 1985 to a surplus of 0.6% of GDP in 1987, so there was no problem with the private sector credits being crowded out by government borrowing requirements. After the implementation of these policies, the financial sector saw a tremendous wave of institutional build-up between 1987

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[15] The official and the parallel exchange rate systems.

and 1996. There were 11 Deposit Money Banks (DMB)[16] by the end of 1986 compared to 18 at the end of 1995. This has increased to 72 in 2009 (Bank of Ghana, 1988). November 1990 saw the establishment of a stock exchange. Besides that, the financial sector had also seen the establishment of institutions such as the Export Finance Company, and The Home Finance Company which are to finance Ghana's growing export sector and the private housing respectively. Furthermore, two discount houses were established during this period to facilitate the operations of the financial sector. There have also been some negative sides of this build-up. For example, between 1993 and 1995 there was a boom of "pyramid investment schemes" which were later abolished by the government, and two banks collapse (BCCI and Meridian BIAO) within the same period (Ghana Stock Exchange website, 2010).

To facilitate the smooth operations of the liberalised financial sector, the government promulgated two new laws to replace the old ones. These were the Bank of Ghana Law 1992 (PNDCL 291) and the Ghana Banking Law 1989 (PNDCL 225). Due to the increase in the number of Non-Banking financial institutions, another law (PNDCL 238) was also promulgated in 1992 to regulate their activities. In fulfilment of the objectives of the financial liberalisation policy, between 1994 and 1995 the government sold a majority of its share holdings in two banks in an attempt to list them on the stock exchange.

The interest rate liberalisation, in the context of the Ghanaian economy, poses many interesting questions. This is not only because, prior to the policy, the country had an unsatisfactory resource mobilisation and a narrow financial deepening, but also because interest rate liberalisation was implemented under conditions of high unemployment, high inflation, and fast depreciating domestic currency. A simple methodology used to assess the impact of the financial liberalisation on the economy of Ghana in this chapter is a before-and-after test which compares the average figures[17] pre and post the implementation of the financial liberalisation policies.

4.4   Interest rate liberalisation, financial savings and Interest rates trends

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[16] All financial institutions except rural banks and forex bureaux.
[17] Simple mean values.

Interest rate liberalisation in Ghana started in 1987 with the abolition of the minimum and maximum deposit rates. However, the rates on lending were left unchanged. In 1989, banks and other financial institutions were allowed to determine their lending, but interest rates were not fully liberalised until 1991. According to the financial liberalisation hypothesis, removal of interest rate should lead to increase in financial savings, investments and hence economics growth. In Ghana, as observed from Table 4.1, total financial savings as a percentage of GDP, increased from 1969 until 1983 when it started to decrease from the previous year's level of 70.4% to 27.4%. The rapid decrease in total deposit that occurred between 1982-84 was caused primarily by some measures taken by the Provisional National Defence Council (PNDC) government to eliminate fraud (including freezing certain banks deposits pending investigations for tax liability), withdrawal of some denominations of the domestic currency from circulation and rampant change of currency notes leading to loss of confidence in the domestic currency and the banking system as a whole. This trend continued through to 1986 then stabilised for the next two years. From 1989, financial savings started picking-up steadily through to 1995, even though the level was still low compared to those of the late 70's and the early 80's. The trend reversed after the implementation of the full interest rate liberalisation policy in 1990. Following the policy, financial savings increased continuously for a period of 12 years then dropped drastically from almost 188.2% of GDP in 2001 to 21.9% in 2002[18]. After this massive drop, financial savings started to improve again, increasing consistently from 2002 to 2008 due to the prevailing political and economic stability in the country. As can be seen from Table 4.1, financial savings as a percentage of GDP has increased by about 11.1% points on the average since the implementation of the interest rate liberalisation compared with the pre liberalisation period. This was mainly due to the relatively higher interest on deposits offered by the banks compared to other asset types.

Table 4.1: Financial savings, Interest rates, Foreign Direct Investment and Exchange rate in Ghana between 1969- 2008.

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[18] This is because of capital flight resulting from political uncertainty and change in financial reporting.

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate Cedi per US Dollar ($)
1969	11.7	12.6	n/a	n/a	5.5	n/a	0.0001
1970	12.2	8.2	n/a	n/a	5.5	3.1	0.0001
1971	12.4	1.0	n/a	n/a	8.0	1.3	0.0001
1972	15.1	2.9	n/a	n/a	8.0	0.5	0.0001
1973	18.3	0.5	n/a	n/a	6.0	0.6	0.0001
1974	19.0	2.2	n/a	n/a	6.0	0.5	0.0001
1975	27.0	0.5	n/a	n/a	8.0	2.5	0.0001
1976	37.6	1.5	n/a	n/a	8.0	-0.7	0.0001
1977	50.2	0.9	n/a	n/a	8.0	0.6	0.0001
1978	43.7	0.7	19.0	11.5	13.5	0.3	0.0002
1979	29.8	1.0	19.0	11.5	13.5	-0.1	0.0003
1980	33.7	1.5	19.0	11.5	13.5	0.4	0.0003
1981	52.6	2.3	19.0	11.5	19.5	0.4	0.0003
1982	70.4	2.1	19.0	11.5	10.5	0.4	0.0003
1983	27.4	2.6	19.0	11.5	14.5	0.1	0.0009
1984	9.1	4.4	19.0	15.0	18.0	0.0	0.0036
1985	9.8	9.6	20.5	15.8	18.5	0.1	0.0054
1986	8.5	7.6	22.5	17.0	20.5	0.1	0.0089
1987	7.9	15.6	26.0	17.6	23.5	0.1	0.0154
1988	7.9	16.6	25.0	16.5	26.0	0.1	0.0202
1989	12.6	18.0	23.5	n/a	26.0	0.3	0.0270
Average	**24.6**	**5.4**	**20.9**	**13.7**	**13.4**	**0.5**	**-**
1990	11.2	17.8	23.5	n/a	33.0	0.2	0.0326
1991	12.1	17.6	25.5	21.3	20.0	0.3	0.0368
1992	14.3	15.1	24	16.3	30.0	0.3	0.0437

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate Cedi per US Dollar ($)
1993	12.9	23.2	29.0	23.6	35.0	2.3	0.0649
1994	16.0	28.5	38.0	23.2	33.0	3.6	0.0956
1995	15.3	32.3	38.5	28.7	45.0	1.5	0.1200
1996	9.4	60.1	n/a	34.5	45.0	1.7	0.1636
1997	11.6	55.7	n/a	35.7	45.0	1.1	0.2049
1998	12.8	45.3	n/a	32.1	37.0	2.2	0.2313
1999	15.7	15.4	n/a	23.6	27.0	4.9	0.2668
2000	170.0	42.1	47.0	28.6	27.0	3.1	0.5452
2001	188.2	33.2	44.0	30.9	27.0	1.4	0.7167
2002	21.9	33.2	38.5	16.2	24.5	0.8	0.7928
2003	22.8	30.3	35.5	14.3	21.5	1.5	0.8673
2004	24.2	29.3	28.8	13.6	18.5	1.3	0.9000
2005	23.0	29.2	26.0	10.2	15.0	1.1	0.9068
2006	27.5	28.1	24.3	8.9	12.5	4.2	0.9169
2007	31.8	22.3	24.2	8.9	13.5	6.0	0.9355
2008	37.5	28.1	27.2	11.2	17.0	25.7	1.0570
Average	**35.7**	**30.9**	**31.4**	**20.1**	**27.7**	**3.3**	**-**

Notes: [a] Demand, Savings, Time and Government deposits.
  [b] All the figures are end of year average rates.
Source: Compiled from IMF, International Financial Statistics (2009). Bank of Ghana, Quarterly Economic Bulletin, various issues and Ghana Statistical Services, Quarterly Statistical Digest, various issues.

As can be seen from Table 4.1, interest rates have been on the increase since liberalisation. Deposit rates started from 11.5% in 1978 but ended up at 16.5% before the policy in 1989 with a yearly average of 13.7%. Even the full interest rate liberalisation in 1991 could not reverse the trend. The rate rose to a high of 35.7% in 1997 then dropped to as low as 8.9% in 2006, followed by 11.3% in 2008. The average for the post liberalisation period is therefore 20.1%. This is about 6% points over the pre liberalisation average. Furthermore, the discount and lending rates

followed the same trend as the deposit rate, for example, the lending rate started at 19.0% in 1978, but in 1988 stood at 25.6% with a pre liberalisation average of 20.9%. After the full interest rate liberalisation, the trend continued upwards, reaching 47.0% in 2000 but dropping to 27.3% in 2008 with an average of 31.4%, showing an increase of about 10% points. Comparing the real interest rates, it was found that while the average real deposit rate pre financial liberalisation was negative 39.5%; the figure was negative 1.6% after the implementation of the interest rate liberalisation policy, showing an increase of 37.9% points[19]. The real discount and lending rates followed similar trends. On average, the real lending rate before interest rate liberalisation was negative 30.0% but the real discount rate was negative 28.5% by 2008, the averages were 8.4% and 4.2% respectively. The McKinnon-Shaw hypothesis holds the view that the removal of interest rate ceilings will lead to an increase in the real deposit rates. As can be seen from the above analysis, it can be said that the hypothesis is verified in the case of Ghana as real interest rates have gone up and the total financial savings have started increasing, however, with significant portion being in foreign currency. It is also worth noting that, following the adoption of the unified flexible exchange rate, black market dealings in foreign exchange virtually disappeared and the foreign exchange resources of the black market were almost completely absorbed by the formal sector. This was reflected in the rapid increase in the proportion of foreign currency deposit in the domestic banks.

Related to this is the decline in the size of the underground market economy as measured by the decrease in the ratio of currency outside banks to narrow money (M1). The average of the ratio of currency to M1 pre financial liberalisation was about 56% and that of the post financial liberalisation was about 51%. The decrease of 5% points may suggest the magnitude of the average reduction in the underground economy. But it can be seen from Figure 4.1 that since 1992, the ratio has been increasing, reaching its peak of 77% in the year 2000 and then falling to 39% in 2007. This probably is due to the fact that with increasing inflation over the period (see Table 4.3), demand for money has increase and therefore Ghanaians chose to hold more cash rather than to deposit them with the banks.

4.5   Challenges of the interest rates Liberalisation policy in Ghana

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[19] This was calculated by adjusting the average nominal interest by the average inflation.

Ghana, like many other ECOWAS countries, has faced a number of challenges since the implementation of interest rate liberalisation as part of the ERP in the 1986. Apart from high and increasing interest rates as discussed in the above section, some of the challenges that Ghana has experienced since the implementation of financial liberalisation policy relate to the mixed savings, investment and financial deepening trends, changes in the sectoral allocation of credits, low economic growth rate in relation to financial depth, the wide spread between lending and deposit rates and foreign currency deposits. These sets of challenges are discussed separately below.

4.5.1   Interest rate liberalisation, Investments and Financial Deepening

The McKinnon- Shaw hypothesis postulates that financial liberalisation will lead to an increase in savings and investment, and hence cause rapid economic growth. Whilst in the pre financial liberalisation period, the average proportion of the GDP invested was 9.6%, it increased by more than two-fold to 21.9% after the financial liberalisation policy (this increase was not via increase in domestic savings only but also via borrowing from the international organisations and donor countries) and reaching 33.0% in 2006 and 2007 (World Bank, 2009). On the other hand, the savings ratio which began on almost the same level as investments pre the financial liberalisation rate, increased to 13% in 1996 then tumbled to a low of 3% in 2005. At the same time foreign direct investments (FDI) flow into the country, expressed as a percentage of GDP, increased from a mere average of 0.5% pre liberalisation to an average of 3.3% post financial liberalisation period (see Table 4.1).

One other positive outcome of the financial liberalisation is the increase in the capital flow and the consequential augmentation of the country's foreign exchange reserves. Prior to the financial liberalisation, the stock of total reserves (minus gold) was $347.3m in 1989; this figure increased to $2,090.3 by the end of 2006. The increase in FDI could be attributed to several factors. One factor relates to the reduction in the country's risk premium, as a result of the relatively macroeconomic stability and the flexible exchange rate regime following the implementation of the financial liberalisation policy. As the financial liberalisation programme stayed on course,

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the credibility of the country increased and its risk premium diminished leading to an increase in FDI. The increased workers' remittances from abroad[20] through the official channels have also contributed to the increase in the country's foreign exchange reserves. Another factor that might be responsible for the increased FDI could be the relative political stability which now prevails in the country. Ghana has emerged -- thanks to the political stability and the Economic Recovery Programme (ERP) -- as the gateway to the West African sub-region.

Financial deepening, as measured by the ratio of M2 (money and quasi-money) to GDP as could be observed from Figure 4.1, started falling in 1980 from 20.0% through to 10.0% in 1984, then rose by 4% points to 14.0% in 1989. It has since been increasing, reaching a high of 29.0% in 2007. This level is however, the highest in the country's economic history. It is hoped that, as the financial liberalisation programme stays on course and the financial system matures together with the capital account liberalisation, financial assets such as stocks, bonds (issued by both government and firms), will appear on the financial market and with growth in income, financial deepening would also increase. This is because (ceteris paribus), with increase in the real rate of return on financial assets, assets held previously in the form of say, large inventories, gold, land and livestock, will find their way into the formal financial system. It should be noted however that the main aim of financial liberalisation is to cause a shift of savings from lower-productivity self-investment to higher productivity investment intermediated by the formal financial sector.

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[20] This is estimated to be about $2.0 billion in 2008.

**Figure 4.1: Investment, Savings, Financial deepening and Currency
outside banks for Ghana, 1969-2008**
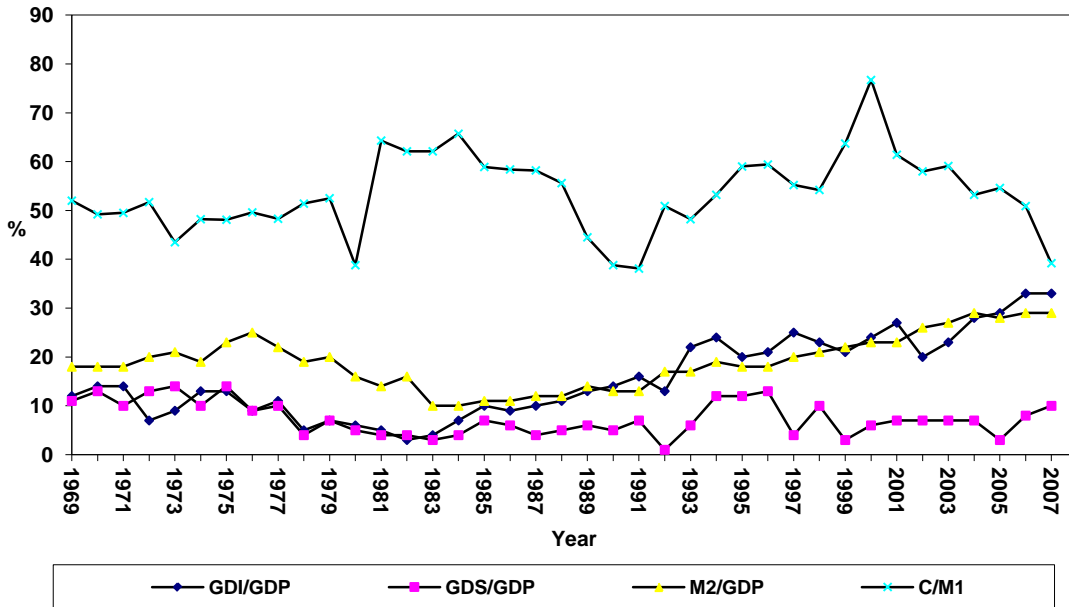
4.5.2   Interest rate liberalisation and sectoral credit allocation

As observed in Figure 4.2, there has been a tremendous change in the structure of credit allocated to the various sectors by the banks before and after the removal of credit controls in 1990 and full interest rate liberalisation in 1991. While pre financial liberalisation, Agriculture, Forestry and Fishing, Manufacturing, Construction and Trade and Commerce were allocated on the average 22.0%, 29.3%, 11.0% and 20.0% of the total credit respectively, the post financial liberalisation situation shows Agriculture at 10.2%. Manufacturing, 23.7%, Construction, 9.8% and Trade and Commerce, 24.7%. It is obvious that whilst the proportion of credits allocated to the Agricultural sector has halved, that of Trade and Commerce has gone up, suggesting the relative profitability of the two sectors. The question that may follow will be: Does this change the composition of the credit allocation and reflect an increase in the efficiency in credit allocation resulting from the liberalisation policies?

Figure 4.2: Sectoral allocation of credit by commercial banks in Ghana between 1984-2008.
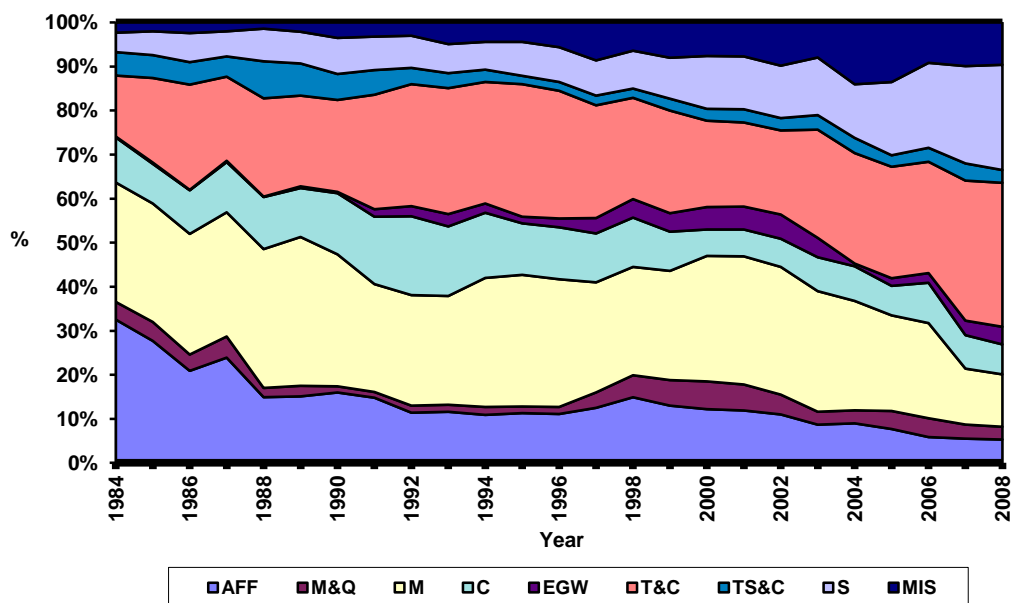
Notes: AFF - Agriculture, Fishing and Forestry (include. Cocoa Marketing); M&Q - Mining and Quarrying; M- Manufacturing; C - Construction; EGW - Electricity, Gas and Water; T&C - Trade and Commerce; TS&C - Transport, Storage and Communication; S - Service; MIS - Miscellaneous.
Source: Compiled from Bank of Ghana, Quarterly Economic Bulletin and Ghana Statistical Society's Ghana in Figures, various issues.

The allocative efficiency of credit in an economy can be measured in several ways; the best is probably to compare marginal returns on capital investment across different sectors of the economy. If the marginal returns in different sectors are equal, one may say that the economy allocates credits efficiency on the assumption that risk, uncertainty and transaction cost are kept constant. Due to data non-availability, it was difficult to obtain accurate estimates of marginal return on credits in different sectors of the Ghanaian economy. One alternative was to compare the cost of credit in different sectors on the assumption that firms, in order to maximise profit, equate their marginal cost of capital and marginal rate of return on investment. This approach has been used by Cho (1988) to study the efficiency of credit allocation after financial liberalisation in South Korea, and the same approach is taken in this thesis. It is hypothesised that credit allocation in an economy has become efficient (or at least more efficient), if borrowing costs in different sectors of the economy are equalised (or differences in borrowing costs are reduced).

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Following this conceptual framework, the following calculations on the Ghanaian sectoral borrowing cost were made. The borrowing cost of each sector was calculated between 1980 and 2008, by dividing total interest and discount payments by the total amount of debt in each sector, which included all sources[21] of borrowing[22]. The variation in the borrowing cost reflects the differential borrowing cost for different sectors offered by the banks. Under the assumption that with an increase in efficiency of credit allocation, the variance of borrowing cost of the sectors should reduce, the following results, as shown in Table 4.2, were obtained. The results from Table 4.2 show that the variances before financial liberalisation were relatively smaller except in 1984 when it jumped from the previous year's figure of 0 to 4 then tumbled to 1 in 1985 until falling to 0.07 in 1986 and subsequently to 0.23 in 1990. The average variance for the pre liberalisation period was therefore 0.7. The situation after the financial liberalisation, however, shows a relatively steady increase from 1991, reaching 6.36 in 1998. This has been the situation since then reaching 8.13 in 2002 and 7.19 in 2007 then falling to 5.48 in 2008. The average for this period is therefore 5.08. This shows an increase in lending risk between the periods before and after the financial liberalisation by 647% on the average. The results obtained must be interpreted with caution, since the underlying assumptions of the concept used in the analysis are strong[23]. One should also note that it is not clear whether a lower variance of cost of borrowing between sectors is an indication of allocative efficiency and also no adjustments for risk were made in the interest rate figures.

Table 4.2: Cost of borrowing (credits) of different sectors of the Ghanaian economy

Year	Average[a] (%)	Variance	Year	Average[a] (%)	Variance
1980	19.00	0.00	1995	39.72	2.30
1981	19.00	0.27	1996	39.94	5.60
1982	19.00	0.07	1997	43.00	5.66
1983	19.00	0.00	1998	39.00	6.36
1984	21.17	4.00	1999	36.50	4.60

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[21] Since data on informal sector credit activities were not available, the thesis uses only the formal financial sector borrowings (i.e.. all the Deposit Money Bank)

[22] Again because of non-availability of data, the thesis uses the average cost of borrowing in each sector instead of marginal cost of borrowing.

[23] Of course, in practice, different sectors have different risk, uncertainty, and transaction cost and therefore borrowing cost may not equalise.

Year	Average[a] (%)	Variance	Year	Average[a] (%)	Variance
1985	21.17	1.00	2000	47.00	5.66
1986	20.00	0.07	2001	43.75	6.19
1987	25.50	0.70	2002	38.50	8.13
1988	25.58	0.80	2003	35.25	5.48
1989	26.07	0.30	2004	28.75	5.13
1990	26.04	0.23	2005	26.00	5.30
1991	26.16	1.32	2006	24.25	6.54
1992	24.19	2.53	2007	24.17	7.19
1993	31.25	2.75	2008	27.25	5.48
1994	30.25	5.30			

[a] All the figures are end of year averages.
Source: Compiled from Bank of Ghana, Quarterly Economic Bulletin, various issues and Ghana Statistical Service, Quarterly Statistical Digest and Ghana in figures, various issues.

However, the results provide an initial step towards an in-depth research into the allocative efficiency of credits in Ghana after the financial liberalisation policy and therefore an inference could be made out of it. According to Aryeetey (1994), this apparent less efficient allocation of credits under financial liberalisation in Ghana may be due to a number of institutional, structural and financial constraint created under the repressed regime and the apparent lack of medium-term financing, rudimentary nature of capital market and weakness in the financial intermediation in general. He argues that as a consequence of these, private businesses find it difficult to contract credit leading to an apparent lack of competition hence less efficiency. Thus, in a total of 133 private firms surveyed by Aryeetey, Steel, et al. (1993) in Ghana, they reported that inadequate finance was the most significant constraint for about 60% of these companies. Even though it was the most important constraint for the group, it would appear that contracting credit was a serious constraint for the smaller firms (See also Adjustment in Africa: Lessons from country case studies; Ghana: Front-runner in adjustment, World Bank (1994), p178-9 for more on this point).

Another reason could be the generally accepted deep mistrust by the private sector for a government whose policies, first in 1979 and then 1982-83 and in 1992 indicated an antagonistic

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attitude towards private investment. Some of the policies taken by the Armed Forces Revolutionary Council (AFRC) and the Provisional National Defence Council (PNDC) governments in 1979 and 1982 and furthermore, the National Democratic Congress (NDC) government in 1993 to 2001 strongly suggested a bias towards private wealth. These included the freezing of all individual bank accounts with balances exceeding 50,000 Cedis ($1 = 2.75 Cedis) and the confiscation of private properties through the so-called citizen's vetting committee may be a good reason for the absence of competition in the credit market. Furthermore, according to a survey conducted on 133 private firms[24] by Aryeetey, Steel et al. (1993), the sentiment often expressed among Ghanaian investors is that the various macroeconomic reforms are being undertaken by the government only to satisfy the donor conditions so as to get assistance, hence in the absence of such assistance the government will reverse the liberalisation policies. In reaction to this the private sector chooses to put their capital in short-term investments and engage in the sector of the economy with quick and high turnover, such as trade and commerce, and with the relaxation in the restrictions on imports of finish goods, the private sector appears to choose trading over long-term physical investment (Figure 4.2 supports this point).

An additional contributing factor could be the presence of moral hazard (where banks prefer to be risk lovers and provide risky loans with high interest rates in expectation that losses will be covered by the government while gains would accrue to themselves) cost of borrowing is likely to expand, leading to increased distress borrowing, increased probability of default and bank failure (McKinnon 1989). The above evidence and reasons may suggest that even though the volatility of borrowing costs among different sectors of the economy has increase under the financial liberalisation policy, leading to less efficiency in the allocation of credit, the cause cannot be put on the financial liberalisation policy per se, but rather on some interrelated bottlenecks (both political and economic) that existed and still exist in the financial sector and in the economy as a whole.

4.5.3   Interest rate liberalisation and Economic growth

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[24] This survey included Small, Medium and Large

According to the McKinnon-Shaw hypothesis, the ultimate goal of financial liberalisation is to generate rapid economic growth. As can be seen from Table 4.3, annual average GDP growth pre financial liberalisation was 1.0% but after the implementation of the policy, the economy was growing at an average rate of 4.8%. One may also notice that the growth rates before financial liberalisation were not steady. There were years when negative rates were recorded, some as low as negative 13.4% in 1975, and some years recorded positive rates as high as 8.8% in 1984, however, post financial liberalisation period has seen constant positive growth rates from 1991 through to 2008.

This is in conformity with the hypothesis, however, it could also be argued that the growth is not only due to the financial liberalisation policy[25] but is also associated with the increase in government borrowings from international organisations, remittance from abroad, increase in export revenue, accumulation of human capital, technological transfer, and accumulation of production experience.

Table 4.3: Selected Macroeconomic Indicators for Ghana between 1975- 2008

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI),%	Trade Balance (% of GDP)
1975	-13.4	30.0	5.4
1976	-3.5	56.0	3.2
1977	1.8	116.0	0.9
1978	9.8	73.0	3.1
1979	-1.7	54.0	6.5
1980	0.6	50.0	4.4
1981	-2.9	117.0	-5.8
1982	-6.5	22.0	0.5
1983	-4.4	123.0	-1.5
1984	8.8	40.0	0.7

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[25] See Table 4.3 col.2, even before the financial liberalisation, the economy has started growing (i.e. 4.6%, 5.5% and 5.0% in 1988, 1988 and 1989 respectively)

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI),%	Trade Balance (% of GDP)
1985	5.1	10.0	-0.8
1986	5.1	24.8	1.3
1987	4.6	39.7	-2.1
1988	5.5	31.4	-2.2
1989	5.0	25.3	-3.9
1990	2.6	37.2	-5.2
Average	**1.0**	**53.1**	**0.3**
1991	5.2	18.0	-4.9
1992	3.6	10.1	-7.3
1993	4.8	25.0	-9.5
1994	3.0	25.0	-6.3
1995	4.8	59.5	-4.0
1996	3.0	47.0	-5.5
1997	4.0	28.0	-9.5
1998	5.0	15.0	-12.1
1999	4.0	12.0	-16.5
2000	4.0	25.0	-16.1
2001	4.0	33.0	-20.7
2002	5.0	15.0	-11.2
2003	5.0	27.0	-8.8
2004	6.0	13.0	-18.0
2005	6.0	15.0	-23.7
2006	6.2	11.6	-23.8
2007	6.0	12.7	-26.0
2008	7.0	18.1	-26.0
Average	**4.8**	**22.8**	**-13.4**

Source: World Bank's African Development Indicators (2009) and IMF International Financial Statistics (2009).

Even though inflation reduced on average after the financial liberalisation, the level is still high compared to other African countries[26]. The government brought its budget deficit under control just after the financial liberalisation policy was implemented but the problem appeared again in 1992 and 1993. This drastic increase in government spending triggered a rapid increase in the rate of inflation from a mere 10.1% in 1992 to about 60% as at the end of 1995. Inflation has been reducing since then, falling to a low of 11.6% in 2006. On average, post liberalisation inflation has been about 22.8%. This represents about 57.1% of the pre liberalisation levels.

One aspect of the financial liberalisation has been the increase in imported consumer goods (IMF, 2009). Even though, the deficit is not only consumer goods, the proportion which constitutes consumer goods has increase significantly. In 1985 the proportion was 47.1%, but as at the end of 1995, it stood at 67.7% and in 2008, this figure rose to about 70%. As can be seen from Figure 4.3, Ghana has not recorded any trade surplus since the implementation of the financial liberalisation policy, while during the pre-liberalisation period; it recorded an average balance of trade surplus of 0.3% of GDP. The post liberalisation period has seen an average balance of trade deficit of 12.7% of GDP. The continuation of this trend may not be sustainable for economic growth in the long run since these (imports) which are mainly consumer goods are being finance through the inflow of foreign capital, remittance from abroad and external borrowings rather than increase in domestic productivity and export revenue.

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[26] For example the average inflation of Ivory Coast for the same period has been around 4.5% per annum whiles that of Senegal was 3.3% (Africa Development Indicators, 2009)

Figure 4.3: Selected Macroeconomic indicators for Ghana between 1975 - 2008
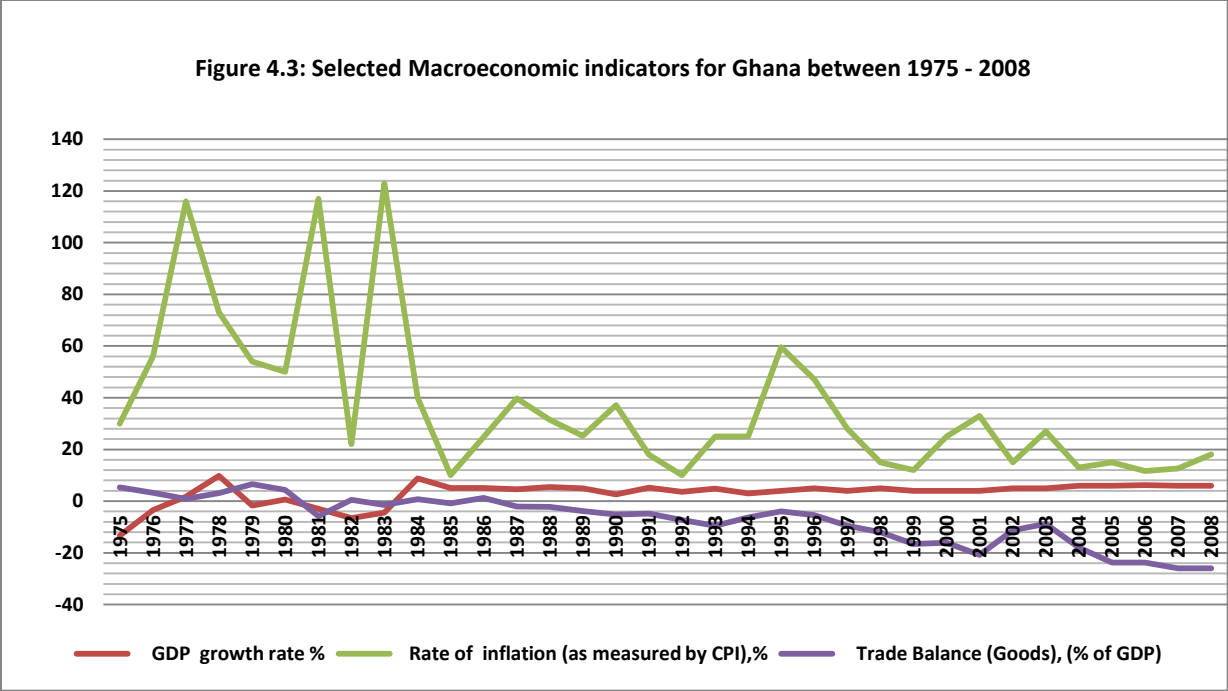
Source: World Bank's African Development Indicators (2009) and IMF International Financial Statistics (2009

4.5.4 Spreads between Lending and Deposit Rates

As can be seen from Figure 4.4, the gap between lending and deposit rates in Ghana has widened significantly since the interest rate liberalisation policy in 1990. Before the interest rate liberalisation policy, the spread between the lending and deposit rates fluctuated between 3.0% in 1986 and 9.1% in 1988 and 1989 with an average for the period of 7.4%. A 7.5% spread was maintained between 1978 and 1983. This was reduced to 6.2% in 1984, then to 5.4% in 1985 then further reduced to its lowest figure of 3.0% in 1986 before increasing to 7.9% in 1987.

Figure 4.4: The spread between deposit and lending rates in Ghana from 1978 to 2008
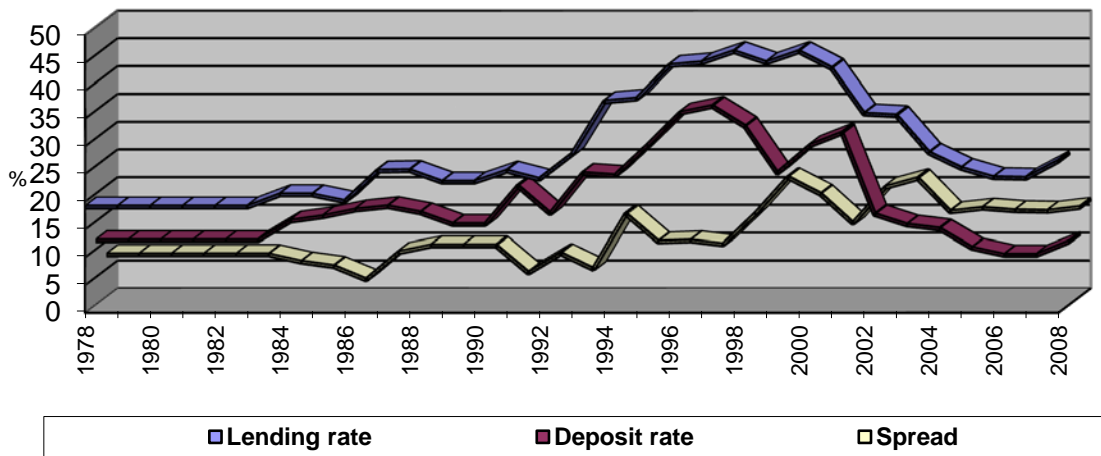
Between 1988 and 1990, the spread was increased and maintained at 9.1%. Following the implementation of the full interest rate liberalisation policy in 1991, the spread narrowed significantly from the previous high of 9.1% in 1990 to 4.2% in 1991. Between 1991 and 2008, the interest rate spread varied between a post liberalisation low of 4.2% and a historic high 21.4% with an average spread of 13.5% for the period to 2008. Between 1997 and 1999, the interest rate spread increased dramatically from 9.8% in 1997 to 21.4% in 1999 and 18.4% in 2000 before decreasing to 13.1% in 2001. In 2002, the spread went up again to 19.6% then 21.2% in 2003. However, since 2004 the interest rate spread has been stable between 15% and 16%, thus, 15.2% in 2004, 15.8% in 2005, 15.4% in 2006, 15.3% in 2007 and 16.0% in 2008.

4.5.5 Interest rate liberalisation and foreign currency deposits

Although financial savings have increased since the implementation of the interest rate liberalisation policy (see Table 4.1 above), one aspect of this increase is the loss of confidence in the domestic currency which has led to a significant increase in foreign currency deposits within the domestic banks. This can be seen from Table 4.1 col. 2, whereas before implementation of

financial liberalisation policy the proportion of total financial savings held in foreign currencies was ranging between 0.5% in 1975 and 18.0% in 1989 with a yearly average of 5.4%, the post liberalisation figures have seen massive increases ranging from 15.1% in 1992 and 60.1% in 1996 with a yearly average of 30.9%. As can be seen, the proportions have been increasing consistently from 1990 through to 2008. The rapid increase in this phenomenon is due to the following reasons: (i) the rapid depreciation of the domestic currency after the financial liberalisation policy; (ii) the relative high or rampant rates of inflation; (iii) the disappearance of the black market dealings in foreign exchange as a result of the operations of the forex bureaux, as well as the acceptance of foreign currencies as deposits by the banks; (iv) inadequate real interest rate; (v) controls on capital markets and (vi) excessive government expenditure. Furthermore, there is also the granting of credits in foreign currency by the domestic banks to the private sector. Since such loans are repayable in foreign currency, their repayment probability is determined not only by the domestic interest rate but also by the exchange rate. This has implications on the monetary policies of the Ghanaian financial authorities.

4.6   Capital account liberalisation, Stock market development and Economic growth

When the Economic Recovery Programme (ERP) started in 1983, Ghana had no stock exchange and hence no domestic stock market. As part of the ERP, Ghana in 1989, established a stock exchange. However, the exchange did not start trading until November 1990. In 1993, foreign investors were allowed to participate in the trading activities but with restrictions. However, these restrictions were removed when the capital accounts were fully liberalised in 2006. Now let's look at a brief history and current developmental issues of Ghana's stock market.

4.6.1 The origins of Capital market in Ghana

In the early years after independence, the idea of establishing a stock exchange in Ghana was hatched. But it wasn't until 1968 that real initiatives to achieve this began. This led to the subsequent promulgation or enactment of the Stock Market Act of 1971. This act laid the

foundation for the establishment of the original Accra Stock Market Limited (ASML) in 1971. However, macroeconomic instability, political instability as well as lack of government support, all played a part in undermining the take-off of the Accra Stock Market. Beside these early setbacks and impediments, two stock brokerage firms, the National Trust Holding Company Ltd (NTHC) and the National Stockbrokers Ltd (which is now called Merban Stockbrokers), were established prior to the commencement of the Ghana Stock Exchange in November 1990. Initially, the Ghana Stock Exchange (GSE) operated over-the-counter (OTC) trading in shares of some foreign-owned companies and later some domestic-owned companies (GSE website, 2009).

As part of the ERP and under the supervision of the IMF and World Bank, Ghana underwent massive structural reforms which led to the removal of distortions in the economy. These reforms included financial reforms to deregulate interest rates, remove credit controls as well as floating of exchange rates. After the financial reforms and a further divestiture of a host of state owned enterprises, the need for stock market in Ghana became inevitable. The Ghana Stock Exchange was incorporated in July 1989 as a private company under the Ghana Companies Code, 1963 (Act 179) and it was recognised as an authorised stock exchange under the Stock Exchange Act of 1971 and commenced trading on the floor of the exchange on November 12, 1990. However, the status of the company was changed to a public company under the Companies' Code in April 1994. The number of listed companies increased to 13 in 1991; 19 in 1995 and to 32 in 2007. As at 2009 the number of companies listed on the stock exchange stood at 37. Out of these, 14 are companies which operate in the financial sector (GSE, 2009).

The Ghana stock market was voted sixth and best performing emerging market in 1993 and 1994 respectively. In 2008, it was voted the best performing stock market in terms of US dollar return in the world (Bloomberg.com, 2009). The GSE capital appreciated by 116% in 1993 and gained 124.3% in its index level in 1997 (GSE, 1997) and returned 64% in 2008 (Bloomberg.com, 2009). Afterwards the listing of AGC changed the face of the GSE and attracted many foreign investors. The market's disappointing 6.3% growth rate in 1995 was partly attributed to high inflation and high interest rates. The increase in the number of listed companies is also reflected in market capitalisation which increased from as little as just over US$ 2.6 million in 2004 to

about $11.5 billion in 2006 and then to $12.8 billion in 2010 (GSE, August 2010). At the same time, the annual turnover ratio remained just about 3.2% in 2004, from an all-time high of 6.5% in 1998. This has however increased to 5.2% in 2008. At present, the GSE holds trading every working day. All out of hours trades are subsequently reported to the GSE at the next trading session. All trading is agreed on the floor of the exchange, except Ashanti Gold shares, which can be traded both through the GSE and over-the-counter after GSE trading hours. There are advanced plans for the exchange to go completely electronic very soon. The main indices are the GSE All Share Index and the Databank Stock Index (DSI). Three new indices comprising the SAS Index (SASI), SAS Manufacturing Index (SAS-MI) and the SAS Financial Index (SAS-FI) have also been published by Strategic African Securities Limited. The main index, GSE All share index stood at 6,190 as at July 2010 (GSE, 2010). At present the Ghanaian stock market is dominated by foreign owned subsidiaries. These include mining, oil distribution, brewing and financial service companies. The top ten companies as measured by market value include such companies as AngloGold Ashanti Ltd, Golden Star Resources Ltd, and Ecobank Transnational Inc. among others who account for about 60% of the trading turnover (Bloomberg.com, 2009).

4.6.2 Stock market developments and economic growth trends

Proponents of capital account liberalisation argue that implementation of the policy will lead to an increase in economic growth. As can be seen from Figure 4.5, it is not entirely clear whether the liberalisation of the capital accounts led to an increase in the economic growth levels. Since the year 2000 there has been a drastic increase in the gross domestic product from $4,977.5m to $16,123.4m in 2008 and a similar trend has been seen in stock market capitalisation figures.

Figure 4.5: Gross Domestic Product and Sock Market Capitalisation in Ghana (1975 - 2008)
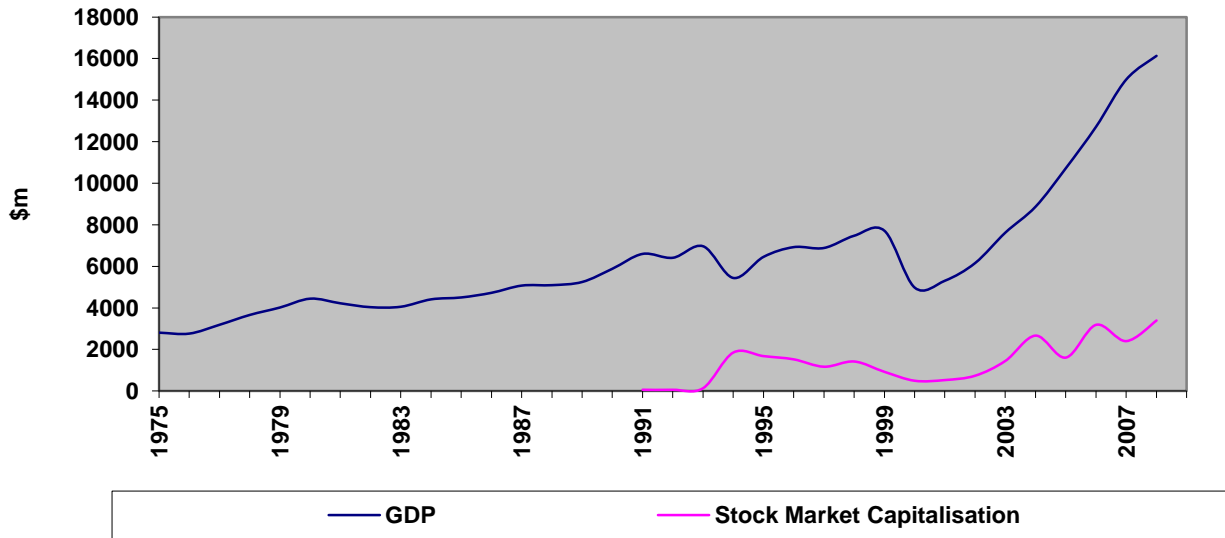
Source: Compiled from World Bank's Africa Development Indicators (2009).

Furthermore, looking at Figure 4.6, it can be seen that all the selected stock market development indicators i.e. stock value traded as a percentage of GDP, Stock turnover as a percentage of market capitalisation and stock market capitalisation as a percentage of GDP, have similar trends as that of economics growth.

Figure 4.6: Ecomonic growth and Selected Stock market indicators for Ghana (1991 - 2008)
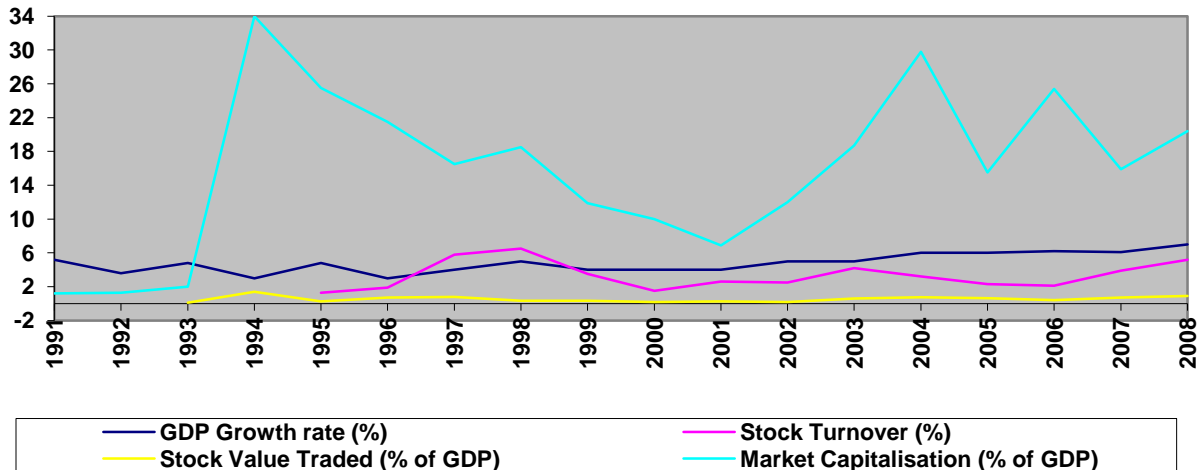
Source: Compiled from World Bank's African Development Indicators, 2009 and IMF International Financial Statistics (2009).

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As can be seen from Figure 4.6, the stock turnover ratio, which is an indication of the liquidity of the stock exchange, has been very low and stable since the inception of the stock exchange. It started at 1.3% in 1995 then increase to 5.8% in 1997 then to 6.5% in 1998. However, it tumbled to 1.5% in 2000 then bounced back at 2.6% in 2001. It then stayed around these levels until 2007 when it increased to 3.9% and then 5.2% in 2008. The stock value traded as a percentage of GDP and GDP growth rates followed the same trend as the turnover ratios. On the other hand, the market capitalisation as a percentage of GDP fluctuated between a maximum of 32% in 1994 and 1.2% in 1991, the year records began. Between 2003 and 2008, the figure has been averaging about 21%. As at 2008, the figure stood at 20.4% which may suggest that they are finding their long-term levels.

4.6.3 Capital market development in Ghana

The Bond Market

One significant achievement of the capital account liberalisation is the creation and growth of the bond market in Ghana. The bond market in Ghana has shown a tremendous improvement and resilience since the first trading of Ghana Stock Exchange Commemorative Registered Stock of 1990. These bonds were a 5-year instrument issued to create a strong foundation for bond trading on the newly created Ghana Stock market. This issue was followed by the by Home Finance Company (HFC) dollar Housing Bond. The authority's objectives of sustaining the development of the bond market in Ghana cannot be ignored. Recently, the government flooded the market with forty-eight, two, three and five-year bonds worth about one billion Ghanaian cedis. This acted as a boost to the primary market and the GSE described it as a significant landmark in the history of the stock exchange. The issues enhanced the bond market in Ghana and also showed it's (the government) commitment to the development of the Ghanaian bond market. As at the end of 2006, total outstanding government bonds stood at $260 million. A further major boost to the capital market was the listing of Standard Chartered Bank's three-year medium term notes, worth about $38 million as well as the issue of preference Shares at the same time. Furthermore, the issue of government of Ghana's Golden Jubilee bond in 2008 also served as a major transformation in the capital markets as well. The aim the jubilee bond was to enhance the

secondary trading on the market and to improve liquidity. Commentators have viewed this as a positive development in the capital market (Bank of Ghana, 2007). One further milestone in the Ghanaian bond market is the issuing of Ghanaian cedi dominated Africa Development Bank (AfDB) Bond in 2006. This two-year bond was worth about $45 million. The objective of the issue is to provide a long-term local currency component to support development projects and at the same time to help deepen the bond market in Ghana (Africa Development Bank (AfDB), 2007).

According to GSE, the year 2007 was the "golden" year for Ghana's capital market. For example, market capitalisation shot up by 22.38% at $12.2 billion in 2007 from a previous value of $10.0 billion in 2006. Volume and value of shares traded were 98.3 million shares and $51.6 million respectively as against 81.4 million shares valued at $50.3 million in 2005. Also, in 2007, trading in listed bonds was valued at $0.2 million as against $0.01 million in 2006. In addition, over-the-counter (OTC) trading in 2007 made tremendous improvement. The volume of shares traded increased by 193% from 98 million in 2006 to 287 million in 2007. The value of the corresponding shares traded also rose from $5.2 million to $15.2 million. As at 2007, 32 companies were listed on the Ghana Stock Exchange with a market capitalisation of about $12.0 billion (GSE, 2007)

One negative aspect of all these developments is the ownership structure of equities listed on the GSE. A detailed look in 2008 indicates that with the exception of ten equities, non-resident foreign investors (NRF) own more than 50% of the total equities. These NRF are mainly institutional investors who want to immunise losses in their investment portfolios by investing in emerging markets, such as Ghana, where returns are usually higher than that of their domestic capital markets. Hence a greater part of benefits derived from the bonds market development in Ghana is accrued to foreign investors.

The Derivative Market

The Ghanaian derivative market is developing steadily. Swaps were introduced in 1997. At its inception, only Continental Assurance Limited (CAL) merchant bank and Barclays bank were

engaged in Forward Rate Agreements (FRA). Ashanti Goldfields Company Ltd. also used some type of derivatives in the form of options, futures and FRA to hedge or protect against downside risk resulting from price fluctuations in gold on the commodity market. For instance, the company sold 4.1 million ounces forward at an average of $432 an ounce and simultaneously sold call options covering 1.1m ounces to expire over 5 years at an average strike price of $459. The total hedging position of 5.4 million ounces represented less than 2.5 of its gold reserve (Harberger, 1998).

Nowadays, there are many participants in the derivative market in Ghana. According to Bank of Ghana, the derivative market would improve the capital structure and profit-making ability of the commercial banks, as well as corporate bodies in the country (Bank of Ghana, 2007). Furthermore, it would strengthen the effectiveness of the monetary policies and bring along more international capital into the country, hence to the acceleration of the economy's future growth prospects. Derivative contracts provide an easy and straightforward way to both reduce risk in the form of hedging, and to take extra risk in the form of speculating. With the establishment of a credit derivatives market in Ghana, credit profile of a particular asset or group of assets of participating banks and other end-users can be split up and redistributed into a more concentrated or diluted form that will appeal to the various risk lover investors (Bank of Ghana, 2007).

The Equity Market

The equity market in Ghana is dominated by multi-national companies and financial institutions. The size of capital market in Ghana in the 1990s, in terms of shares traded and the number of participants was small relative to that of other developed markets. However, the market has developed significantly from its embryonic state from its creation into a major one in the sub-region. From 2000 onwards there were significance increases on trading floors of the GSE. According to IMF (2006), the stock market under performed in the first 4 years of its operations. However, in the mid-1990s the story was different. For example, in 1994 the stock market capitalisation in proportion to GDP reached 34%. This is close to the world average of 38.2% (IMF Working Paper, 2006).

Other Developments

One big boost to the financial market is the re-denomination of the Ghanaian cedi in July 2007. Experts predict this would strengthen the financial market in Ghana. This is because it would reduce high transaction costs and also reduce the inconvenience and high risks involved in carrying loads of currency for transaction purposes. It would further ensure compatibility with data processing software and the strain on payments systems (GNA, 2008). Furthermore, non-resident foreign (NRF) investors can now hold more than 10% of any security listed on the Ghana Stock Exchange. Before 2006, foreign investors were allowed to hold a maximum of 10% in any equity listed on the Ghana Stock Exchange. Also for the first time, non-resident investors are permitted to invest in money market instruments such as treasury bills for a period of three or more years. For example, non-resident investors are allowed to invest in the Government of Ghana's five-year bond due December 2011. Again non-residents are also allowed to maintain foreign currency accounts with local banks, which can be credited with transfers in foreign currency from abroad or other foreign currency accounts. These are very positive changes that will go a long way to boosting the market. Another positive development is a new regulation which offers a temporary exemption on capital gains on securities listed on the Ghana Stock Exchange. This exemption is expected to be in place until December 2010. Furthermore, Venture Capital companies in Ghana have been offered a 5-year tax holiday. This means that financial institutions investing in venture capital subsidiaries may deduct 100% of their equity investment from their taxable income for the year in which they invested (GSE, 2009).

4.6.4 Challenges of the stock markets in Ghana

The following are the challenges that face the development of the capital market in Ghana. They include low liquidity, investor confidence and unpredictability of the market, price forecast, contracts and their enforcement. Each of these is discussed below.

Low Liquidity

The volume of trading that goes on in the exchange is very low. This can be seen from the rate of change in the main index of the exchange which has been stable for a long time, i.e. the stability of the index reflects the low liquidity of the exchange. For example, for a period of six months in 2008, no shares changed hands. This made investors unable to flee as stocks in Nigeria plummeted by 41% during the same period (Bloomberg.com, 2008). According to some observers, it is difficult to call it a stock market because of the low level of liquidity. To help ameliorate this problem the GSE went electronic in December 2008. This is likely to increase the correlation between Ghana and the international capital market by making it easier for international investors to move funds. As the Ghanaian stock market develops and becomes more liquid, it will be subject to the vagaries of the international market (Bloomberg.com, 2008).

Investor confidence and unpredictability of the market

Despite the achievements chalked in the development of the capital markets in Ghana, fluctuations and high interest rates, high rate of inflation and instability or the continued depreciation of the domestic currency, have combined to make it difficult for investors to predict the long-term sustainability of the capital market. Hence, making it difficult to either invest or borrow from the Ghanaian capital market. For example, according to the Bank of Ghana, headline inflation went up from 12.8% in January 2008 to 13.2% in February 2008 (Bank of Ghana, 2008). However, inflation dropped in 2009, reaching a low of 9.5% in June 2010. Furthermore, an examination of the real return on the stock exchange by the Bank of Ghana revealed that the total annual returns on stocks listed on the Ghana stock exchange have followed an undulating pattern since it started trading 1991 with high and low alternating every two years.

Contracts and their enforcement

For the derivative market to thrive it requires strong legal systems for enforcement of contracts. The legal system in Ghana could not be said to have the capability to enforce such contracts. Besides this there is also the lack of financial regulations to ensure the disclosure of adequate information by participants in the capital markets. There is also not enough information available to investors to make investment decisions about the markets. These unfavourable conditions create lack of investor confidence.

4.7   Sequencing of Financial Liberalisation in Ghana

McKinnon (1991) argues that there are two macroeconomic prerequisites to successful implementation of financial liberalisation policies. Firstly, fiscal control and secondly, control over domestic banks for monetary policy purposes. He argues that since financial liberalisation involves the removal of many regulations, it is clear that other sources of revenue must first be found, thus there is a need for development of proper means of tax collection before embarking on financial liberalisation policy. And he cautions that since the authorities will lose control over credit creation, removal of reserve requirements as a means of financial liberalisation policy is not recommended as this may impact on economic growth.

As a consequence of the ERP, Ghana adopted a gradual approach to the liberalisation of interest rates and capital accounts, as can be seen in Table 4.4 below. In Ghana, interest rates were first liberalised then followed by the capital account with the domestic real sector being the first to be liberalised. However, one can argue that the policy was undertaken without any particular improvements in the tax base. Financial liberalisation measures in the late 1980s included the removal of restrictions on interest rates, the elimination of credit ceilings, and opening up the banking system to more competition. Whilst these measures positively affected incentives to lend, other measures taken to stabilise the economy and strengthen the banking system had a short-run negative impact on credit availability to the private sector. For example, tight monetary policies resulted in higher interest rates on government paper than on loans extended to the private sector, leading in turn to non-competitive higher rates to new and smaller borrowers.

Furthermore, efforts to improve portfolio performance led banks to centralise decision-making and maintain their insistence on landed property as collateral, often a stumbling block for the private sector, and hence negative response in terms of economic growth perspective.

In this section, the thesis presents the relevant financial policy reforms since the implementation of the ERP in 1983. Some of the financial reform policies covered in the table include the liberalisation of interest rates, credit controls, cash reserve and liquid asset requirements, supervisory and prudential regulatory changes and exchange rate liberalisation, as well as capital account liberalisation.

Table 4.4: Sequencing of financial Sector Reforms in Ghana (1983 – 2008)

Year	Reform Policy
1982	▪ Currency demonetisation. The amount of money in circulation reduced by 30%.
1983	▪ Multiple windows opened to determined exchange rate.
1986	▪ Introduction of two-window system of exchange rate determination.
1987	▪ The two-window system of exchange rate determination was abolished and a unified system introduced. ▪ A consolidated Discount House was created. ▪ Abolition of the minimum and maximum deposit rates. However, the rates on lending were left unchanged.
1988	▪ Abolition of minimum lending rates charged by commercial banks.
1989	▪ A new banking law (PNDCL 225) was promulgated. This included: a) the tightening of risk exposure limits b) establishment of tighter capital adequacy ratios c) strengthening the accounting standards and making them uniform for all banks and financial institutions d) broadening the scope for audits of the banks e) imposition of stringent reporting requirements and f) improvement in the on- and off-site supervision of banks and other financial institution by the Bank of Ghana.

Year	Reform Policy
	▪ Banks and other financial institutions were allowed to determine their lending rates.
	▪ Establishment of capital market.
1990	▪ A small scale inter-bank market was established.
	▪ The 20% mandatory lending by banks and other financial institutions to the agricultural sector was abolished.
	▪ The Ghana Stock Exchange (GSE) started operations.
1991	▪ Interest rates were fully liberalised.
	▪ Formalisation of the money markets.
	▪ Creation of Security Discount Company (SDC).
1992	▪ Exchange rate fully liberalised.
	▪ Enactment of the revised Bank of Ghana Law (PNDCL 291).
	▪ The central bank, Bank of Ghana, was made independent.
1993	▪ Enactment of the Bank of Ghana Financial Institutions (Non-Banking) Law (PNDCL 328).
	▪ Capital account partially liberalised to allow a limited participation of foreign investors in the capital market.
1995	▪ Recapitalisation and liquidation of non performing banks.
	▪ Privatisation state-owned of banks.
2006	▪ Capital account fully liberalised.
	▪ Restriction on foreign investors in the capital market removed.
	▪ Secondary reserve requirement for banks abolished.
	▪ Banks allowed to expand to other sectors in the economy not specified in their licence without obtaining new licence for such activities
2007	▪ Domestic currency redenominated by dropping four zeros from the prevailing equivalent amounts.

Source: Compiled from Bank of Ghana, Annual Reports various issues.

4.8   Conclusion

It can be concluded from the preceding facts that the financial liberalisation policy instituted under the ERP has been successful on the account that it has increased foreign capital flow, improved the reserve position of the country, stabilised and propelled increased financial savings and prevented and reversed the falling financial deepening and resource mobilisation.

Nevertheless, the financial liberalisation policy in Ghana brought with it a number of interrelated problems which would have to be addressed by the government. These include the large interest rate spread, increase in foreign currency deposits, constant depreciation of the domestic currency, drastic increase in imports and reduction of credits to the productive sectors of the economy. It therefore came as no surprise when, in 1994 in his annual speech to the Ghana Institute of Bankers, the Governor of Bank of Ghana cautioned against the unacceptable level of the spread which he put at 15% point. This rose to its highest of about 21.2% point in 2003 (see Figure 4.4). This thesis is of the view that in addition to lack of competition, other factors such as lack of information on loan terms available at other banks, unwillingness of the banks to reduce lending rates and high operational cost could explain this. To solve these problems the thesis suggests that: (i) the authorities must "guide" the interest rates by setting the margin; (ii) strictly enforce the law on the display of deposit and lending rates in the banking halls, or failing that made to publish their rates in the newspapers; and (iii) the central bank in conjunction with the banks mount a public educational campaign on banking issues as well as microfinance and other forms of formal financial sectors. It should be noted that, even though these approaches may have their drawbacks, they could serve as a way of stabilising the margin in the short-run while appropriate measures are being found in the long-run. Also, setting the margin is not the same as setting the ceiling. Here the authorities must allow the market to determine the rates then guide it by setting the margin.

Another negative effect of the financial liberalisation, which the government should address as soon as possible, is the problem of high lending rates which has discouraged investment in the productive sectors like agriculture where about 50% of the Ghanaian population are still engaged. The extent to which the government should intervene in the financial market to "guide"

credit is still under discussion. The discussion centres on whether the government should only concentrate on creating "the rule of the game" and capacity building, while the market is allowed to freely determine sectoral allocation of credit, or whether it should go beyond that to partially intervene in the allocation of credits.

The case of Ghana, however, supports the financial liberalisation hypothesis on the analysis so far[27]. This is because financial savings, which started decreasing before the financial liberalisation was stabilised for two years of the policy, then in the third year started to increase steadily. Financial deepening as measured by the ratio of money and quasi money (M2) to gross domestic product (GDP) and which was 13% before the financial liberalisation policy stands at 29.0% in 2007. Economic growth has been steady at an average of 4.8% after the financial liberalisation compared to 1.0% pre the policy. Investment which was 14.0% at the beginning of the policy stands at 33.0% of GDP in 2007 and savings which was 5.0% also stands at 10.0% in 2007. The only fly in the ointment is that the efficiency of credit allocation in the economy has suffered significantly. However, one cannot attribute this negative outcome to the financial liberalisation policy alone (see above). The other side is an interrelated bottleneck, rigidity and under-development of the Ghanaian financial system as a whole.

The policy in Ghana has brought to light some of the weaknesses of the financial liberalisation hypothesis. However, recognising these drawbacks does not make the hypothesis deficient, but rather it tells us that policy makers can attempt to solve the problems in various ways by taking into consideration specifications of each country. Alongside financial liberalisation particular attention should be given to institutional development and peculiarity of each country. Under normal circumstances, a country like Ghana with a high degree of openness (50.0% in 1990 and 81.6% in 2007)[28], successful financial liberalisation is envisaged to effect a shift of resources from foreign currency deposits to domestic currency deposits and from the component of the leakage to the formal financial sector because of increase in the deposits rates but instead there was a strong condition for the phenomenon of currency substitution. Currency substitution, as measured by the amount of foreign currency deposit in the domestic banks (see Table 4.1 above),

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[27] A further empirical analysis using econometrical method, autoregressive distributed lag or the bounds testing approach will be performed in this thesis to investigate the impact of financial liberalisation further.
[28] *As* measured by the ratio of export and import to GDP.

stood at 17.8% of total deposits in 1990. This increased to 28.1% in 2008 reaching a high of 60.1% in 1996. Furthermore, using stock market capitalisation as a measure of capital accounts development, it can be seen from figure 4.5 that the relationship between capital account liberalisation and economic growth or development is not clear. As already mentioned, this is just the preliminary analysis, the thesis employs an econometric method, autoregressive distributed lag (ARDL) to investigate any long-term relationship between the two indicators.

One positive aspect of the capital account liberalisation policy is the relatively large inflow of capital into the country. But while the sterilisation of the inflow capital is deemed necessary for ensuring the sustainability of capital, the cost of sterilisation and non-intervention in the foreign exchange market is feared to have jeopardised the fiscal programmes, and the high interest rate is feared to discourage investment in the real sector. Moreover, if Ghanaians are discouraged from saving in the domestic currency because of fast depreciation in value, inadequate savings rate and lack of confidence in the banking system as a whole, then there is always the fear that they will change to holding their savings in foreign currency, which is, unfortunately, the only reasonable option in Ghana due to the infant nature of the domestic financial market. This will aggravate the pressure on the exchange rates and lead to capital flight (if the domestic situation is perceived to be unstable). This could be averted through the stabilisation of the exchange rate and the development of capital markets to introduce alternative financial products such as stocks, corporate bonds, treasury bills[29] and government securities. These products will provide good alternatives to the holding of foreign currencies and allow them to diversify their investments and minimise the risk of holding assets dominated in the domestic currency in times of unstable economic situations. The main challenges facing the capital market must, however, be tackled if the capital markets are to play any major role in Ghana's development.

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[29]At present the treasury bills and government security markets are reasonably well developed in Ghana but there is still the need to develop corporate bonds and other private sector securities market

Chapter Five

Financial Liberalisation in Nigeria

5.1   Introduction

This chapter is the second of the three chapters that focus on the financial liberalisation policies as implemented in the selected ECOWAS countries. The experiences of these countries' financial liberalisation policies, as mentioned, will serve as a basis for the empirical investigation presented in chapters seven and eight. This chapter is sub-divided into eight sections. The second section deals with the origins of financial repression and liberalisation in Nigeria. The third section is a discussion of the origin of interest rate liberalisation in Nigeria, whilst the section after that looks at the trends of the interest rates and financial savings in Nigeria before and after financial liberalisation. Section five looks at the challenges posed by interest rate liberalisation in the Nigerian economy. This section also looks at financial development such as financial deepening and investment. It also investigates the influence of interest rate liberalisation on the sectoral allocation of credit in the Nigerian economy as well as trends of financial depth, interest rates, interest rate spread and economic growth before and after financial liberalisation together with the prevalence of foreign currency deposits in the domestic banks. In section six, the origin of capital markets in Nigeria, trends of capital account liberalisation and economic growth before and after financial liberalisation are analysed, and also current developments in the Nigerian stock market as well as challenges of the capital market are presented. Section seven presents a chronology of financial policy reforms that have been implemented since 1980, whilst in section eight, some concluding remarks are presented.

5.2   The origins of Financial Liberalisation in Nigeria

After serious external debt and balance of payment crises in the middle of the 1980s, Nigeria changed its economic policy from direct to indirect market-determined through the Structural Adjustment Programmes (SAPs) in 1986. Since then several reforms have been carried out including liberalisation of capital account and financial reform by the governments. Following the financial reform of the 1980s, the financial system in Nigeria has changed. The removal of foreign exchange controls and deregulation of financial markets have substantially changed the environment in which monetary policy operates. Government securities and interbank market have deepened, interest rate are determined freely, and reflects market sentiments, and new indirect instruments of monetary controls are developed. At the initial period of the reform programme, inflation rose from 5.4% in 1986 to 40.9% in1989. With the withdrawal of government fund from commercial banks, inflation rate fell drastically to 7.5% in 1990 (Adebiyi, 2005).

However, with the increase of financial and banking crises at the beginning of 1990, inflation reached its highest level of 72.8% in 1995. A return to democracy in May 1999, with good policy programme, helped to reduce inflation to 6.9% in 2000. The main factor behind the inflationary pressure during this period was the lack of budgetary discipline combined with monetary financing and/or domestic debt financing of budget deficit (Adebiyi, 2005). This was mainly due to the lack of harmony between fiscal and monetary policies, which hindered the effectiveness of monetary policy between 1986 and 1998 (Adebiyi, 2005). There is a direct link between monetary policy and the fiscal operations of the government. When deficit fiscal policy is taken, there is a possibility that part of that deficit will be financed by the government through borrowing from the banking system. The portion to be financed from the domestic banking system is part of the aggregate bank credit to the economy. There are serious implications when that portion is exceeded and/or is partly or wholly accounted for by the Central Bank. In this connection, the magnitude and pattern of government fiscal operations have been a major source of ineffective monetary control in Nigeria (Ojo, 2001).

In response to these developments, the private sector has responded by requesting higher real interest rates on government securities and by increasing its foreign exchange holding of foreign currency. This has led to a situation where many Nigerian residents hold a considerable part of their financial wealth in US dollars or other foreign currencies as a hedge against inflation (Ojo, 2001).

5.3   The origins of interest rate liberalisation in Nigeria

The Structural Adjustment Programme (SAP) was adopted in 1986 against the background of international oil market crashes and the resultant deteriorating economic conditions in the country. It was designed to achieve fiscal balance and balance of payments viability by altering and restructuring the production and consumption patterns of the economy, eliminating price distortions, reducing the heavy dependence on crude oil exports and consumer goods imports, enhancing the non-oil export base and achieving growth (Central Bank of Nigeria (CBN), 2008). Other aims were to rationalise the role of the public sector and accelerate the growth potentials of the private sector. The main strategies of the programme were the deregulation of external trade and payments arrangements, the adoption of a market determined exchange rate for the Naira, substantial reduction in complex price and administrative controls and more reliance on market forces as a major determinant of economic activity (Adebiyi, 2005). With the switch to indirect instruments came the change of the goal of monetary policy to the reduction of inflation. This change was prompted by the belief that monetary policy has only temporal effects on real variables and long run effects on prices. Empirical evidence over the years has shown that low inflation is a prerequisite for economic growth. Given the high levels of inflation in the country at the time, especially after the implementation of the reforms policy, there was the need to bring inflation under control before a sustained path to growth could be attained. Using the implementation of policy in line with the IMF financial programming framework, control of growth in money supply became a very important factor in the fight against rampant inflation (CBN, 2008). Targets were set each year for growth in broad money and inflation rate. According to Adebiyi (2005) and Ojo (2001), the implementation of the policy has involved monitoring the deviation of growth in money from target. Controlling the growth of money supply proved to be a difficult task, especially in the years just after financial deregulation. The

almost simultaneous deregulation of both the domestic and foreign sectors led to problems from different sources.

The channels through which the reform would have led to improved growth have been shown to have worsened during the reform. Real deposit and lending rates were negative and savers became poorer during the reform. The rate of inflation also worsened. The growth in real GDP was slowed down due to high inflation rate. Although interest rates responded positively to financial liberalisation, real interest rates behaved differently. For most of the reform years, real deposit rate was negative. The high rates of inflation during the reform period, coupled with the re-imposition of interest rate ceilings brought about the negative real deposit rate (Adebiyi, 2005).

According to Hanson and Neal (1985), "negative real interest rates are generally not a problem, in and of themselves, but a symptom of much larger problems: that the whole macroeconomic framework - monetary, fiscal, exchange rate and tariff policies, as well as the interest rate - are out of line". The strongly negative real interest rate in the Nigerian economy leaves much to be desired as it retards growth by the relative attractiveness of holding money as an asset instead of productive capital thereby depriving the economy investment capital.

According to Oresotu (1992), retail lending rates were reviewed upward and the minimum rediscount rate was also allowed to change. As observed by Aziakpono and Babatope-Obasa (2003), the minimum rediscount rate was fixed at 15% in August 1987 but was reduced to 12.75% in December 1987 as a result of the negative real rates. Subsequent to the initial measure of interest rate deregulation, the spread between deposit and lending rates began to widen. For example, in 1989, average savings rate was at 16.4% while prime-lending rate was at 26.8% representing a spread of about 10.4%. The monetary authorities intervened by limiting the spread between deposit, and lending rates. Sanusi (2002a) notes that widening of interest rate spread in the 1990s was due to the oligopolistic nature of the banking system. The reform of the financial system led to changes in the sector in an effort to foster competition, strengthen the supervisory role of the regulatory authority and streamline the relationship between the public and financial sectors of the economy. To foster competition, new financial institutions were granted licenses.

For example, Oresotu (1992) noted that 79 new banks with 824 nationwide branches began operations between 1986 and 1991.

Odife (1988) contains a more comprehensive account of the motivation and design of the structural adjustment program in Nigeria. The power of the Central Bank of Nigeria (CBN) was strengthened through the following two new Decrees: the Central Bank of Nigeria Decree 24 and the Banks and Other Financial Institutions Decree 25 (BOFID). The new laws facilitated the introduction of new financial instruments for the purpose of enhancing the ability of the CBN to manage the monetary system and also led to financial deepening of the economy. Moreover, according to Sanusi (2002a, 2002b), interest rate deregulation de-emphasised the use of credit allocation and control policies. It paved the way for the use of indirect controls such as open market operations (OMO), reserve requirements, and moral suasion in monetary management (Nnanna, 2001).

The financial liberalisation in the context of the Nigerian economy, poses many interesting questions. This is not only because the financial liberalisation policy was implemented on the background of international oil market crashes and the resultant deteriorating economic conditions in the country, it was also implemented in a period of high inflation and government deficit. The policy was designed to achieve fiscal balance and balance of payments viability by altering and restructuring the production and consumption patterns of the economy, eliminating price distortions, reducing the heavy dependence on crude oil exports and consumer goods imports, enhancing the non-oil export base and achieving sustainable growth. Other aims were also to rationalise the role of the public sector and accelerate the growth potential of the private sector as well as to correct the government deficit. Furthermore, the policy was implemented under conditions of unsatisfactory resource mobilisation, low financial deepening, high unemployment, high inflation, and fast depreciating domestic currency. A simple methodology used to assess the impact of the financial liberalisation on the economy of Nigeria in this chapter is a before-and-after test which compares the average figures[30] pre and post the implementation of the financial liberalisation policy.

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[30] Simple mean values.

5.4   Interest rate liberalisation, financial savings and Interest rate trends

Interest rate liberalisation in Nigeria started in 1987 when controls on interest rates were completely abolished and licensing of banks was fully liberalised. However, it was not until 1989 that money deposit banks were allowed to pay interest demand deposit accounts. As observed from Table 5.1, the total deposits with banks as a percentage of GDP increased steadily from 8.5% in 1969 to a high of 75.6% in 1984 then dropping to 27.0% in 1987 (the years of the policy). This trend continued after the implementation of the policy, dropping to a low of 17.0% in 1989. Three years after the policy, financial savings started to increase, reaching a high of 49.7% in 1999 before falling to 12.9% in 2001. Since 2001, financial savings have been increasing steadily, reaching 26.2% in 2008. On average, the financial savings in Nigeria have decreased by 4.9% points post liberalisation period compared to the pre liberalisation period.

Table 5.1: Financial savings, interest rates, foreign direct investment and exchange rate for Nigeria between 1969 and 2008

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate Naira per US Dollar ($)
1969	8.5	0.0	7.0	3.0	4.5	2.1	0.714
1970	7.0	0.0	7.0	3.0	4.5	1.6	0.714
1971	10.9	0.0	7.0	3.0	4.5	3.1	0.658
1972	10.0	0.0	7.0	3.0	4.5	2.5	0.658
1973	10.3	0.0	7.0	3.0	4.5	2.5	0.658
1974	11.2	0.0	7.0	3.0	4.5	1.2	0.616
1975	16.7	0.0	6.3	3.0	3.5	1.5	0.627
1976	18.6	0.0	6.5	2.7	3.5	0.9	0.631
1977	22.6	0.0	6.0	2.8	4.0	1.2	0.651
1978	23.0	0.0	6.8	4.2	5.0	0.6	0.647
1979	26.9	0.0	7.8	4.5	5.0	0.7	0.561

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate Naira per US Dollar ($)
1980	29.5	0.0	8.4	5.3	6.0	-1.2	0.544
1981	29.2	0.0	8.9	5.7	6.0	0.9	0.637
1982	42.0	0.0	9.5	7.6	8.0	0.9	0.670
1983	58.1	0.0	10.0	7.4	8.0	1.0	0.749
1984	75.6	0.0	10.2	8.3	10.0	0.7	0.808
1985	68.4	0.0	9.4	9.1	10.0	1.7	1.000
1986	30.5	0.0	10.0	9.2	10.0	1.0	3.317
1987	27.0	0.0	14.0	13.1	12.8	2.6	4.141
Average	**27.7**	**0.0**	**8.2**	**5.3**	**6.3**	**1.3**	
1988	27.2	0.0	16.6	13.0	12.8	1.7	5.353
1989	17.0	0.0	20.4	14.7	18.5	7.9	7.651
1990	17.6	0.0	25.3	19.8	18.5	2.1	9.001
1991	22.2	0.1	20.0	14.9	15.5	2.6	9.862
1992	13.4	0.0	24.8	18.0	17.5	2.7	19.646
1993	27.7	0.0	31.7	23.2	26.0	6.3	21.882
1994	31.3	1.0	20.5	13.1	13.5	8.3	21.997
1995	32.0	4.1	20.2	13.5	13.5	3.8	21.887
1996	31.2	2.8	20.3	13.0	13.5	4.5	21.886
1997	37.7	2.1	17.8	7.2	13.5	4.2	21.886
1998	49.7	3.1	18.2	10.1	13.5	3.3	21.886
1999	15.1	7.9	20.3	12.8	18.0	2.9	97.950
2000	12.9	6.3	21.3	11.7	14.0	2.5	109.550
2001	17.3	5.0	23.4	15.3	20.5	2.5	112.950
2002	15.5	9.4	24.8	16.7	16.5	3.2	126.400
2003	14.4	9.2	20.7	14.2	15.0	3.0	136.500

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate Naira per US Dollar ($)
2004	14.3	10.4	19.2	13.7	15.0	2.1	132.350
2005	14.1	13.9	18.0	10.5	13.0	2.7	129.000
2006	17.2	9.3	16.9	9.7	10.0	3.7	128.270
2007	25.6	9.5	16.9	10.3	9.5	3.7	117.968
2008	26.2	12.2	15.5	12.0	9.8	n/a	132.563
Average	**22.8**	**5.1**	**20.6**	**13.7**	**15.1**	**3.7**	

Notes: [a] Demand, Savings and Time deposits.
      [b] End of year average rates.
Source: Compiled from IMF, International Financial Statistics (2009); World Bank, African Development Indicators (2009); Central Bank of Nigeria, Financial Statistics (2008).

As can be seen from Table 5.1, interest rates have been increasing since liberalisation. Deposits rate started from 3.0% in 1969 but ended up at 13.1% before the policy in 1987 with a yearly average of 5.3%. Even the full interest rate liberalisation in 1987 could not reverse the trend. The rate rose to a high of 23.2% in 1993 then dropped to as low as 7.2% in 1996, then to 12.0% in 2008. The average for the post liberalisation period is therefore 13.7%. This is about 8% points over the pre liberalisation average. Furthermore, the discount and lending rates followed the same trend as the deposit rate, for example, the lending rate started at 7.0% in 1969, but in 1987 stood at 14.0% with a pre liberalisation average of 8.2%. After the full interest rate liberalisation, the trend continued to increase reaching 31.7% in 1993 but dropping to 15.5% in 2008 with an average of 20.6% showing an increase on about 12% points. Comparing the real interest rates, it was found that while the average real deposit rate pre financial liberalisation was negative 9.0%; the figure was negative 11.2% after the implementation of the interest rate liberalisation policy, showing a decrease of negative 2% points.

The real discount rate followed similar trends. On average, the real discount rate was negative 1.9% by 2008 with a post liberalisation average of negative 9.8%. This shows a fall of negative

1.7% points[31] compared with the pre liberalisation average. However, the lending rate did not follow a similar trend. The average real lending rate before interest rate liberalisation was negative 6.1% but increased to negative 4.3% post liberalisation. This shows an increase of about 2.0% points. This is contrary to the McKinnon-Shaw hypothesis that removal of interest rate ceilings will lead to an increase in the real deposit rates. The hypothesis therefore is not fully verified in the case of Nigeria. On the other hand, total financial savings have started increasing, but with an increasing portion being held in foreign currency deposits. The policy outcome in Nigeria is therefore mixed on the above basis[32].

However, it is also worth noting that, following the adoption of the unification of flexible exchange rate and the establishment of foreign exchange bureaus in 1986, black market dealings in foreign exchange virtually disappeared. One could therefore argue that the foreign exchange resources of the black market were almost completely absorbed by the formal sector as the citizens were allowed to open foreign currency accounts with the banks. This was reflected in the rapid increase in the proportion of foreign currency deposit in the domestic banks (see Table 5.1, col. 2). Related to this is the decline in the size of the underground market economy as measured by the decrease in the ratio of currency outside banks to narrow money (M1). The average of the ratio of currency to M1 pre financial liberalisation was 43.0% and the post financial liberalisation average was 40.0%. The slight decrease of 3.0% points may suggest the magnitude of the reduction in the underground economy. But it can be seen from Figure 5.1 that since 1997, the ratio has been decreasing, reaching 18.4% in 2008. The financial liberalisation policy was able to reverse the rapid declining total savings, as was anticipated, but rather aggravated the problem of the foreign currency deposit in the Nigerian banking system. It also reduced the activities of the informal financial sector, by implication, as a result of the implementation of flexible exchange rate and banking penetration.

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[31] This was calculated by adjusting the average nominal interest by the average inflation.
[32] Studies relating to interest rates on savings, investment and money supply in Nigeria, though limited in scope and hampered with methodological problems are inconclusive. While some, for example Lambo (1986), Ajayi and Ojo (1986) and Ajewole (1989) concluded that interest rate is an insignificant factor, others like Owosekun (1978) conclude that it is significant.

5.5   Challenges of interest rate liberalisation policy in Nigeria

Nigeria, like the other ECOWAS countries, especially those depending on single commodity for their export revenue, has faced a number of challenges since the implementation of interest rate liberalisation as part of the SAP in the 1986. Apart from high and increasing interest rates as discussed in the above section, some of the challenges that Nigeria has experienced since the implementation of financial liberalisation policy relate to the mixed savings, investment and financial deepening trends, changes in the sectoral allocation of credits, low economic growth rate in relation to financial depth, the relatively wide spread between lending and deposit rates and foreign currency deposits. These sets of challenges are discussed separately below.

5.5.1   Interest rate liberalisation, Investments and Financial Deepening

The McKinnon-Shaw hypothesis postulates that financial liberalisation will lead to an increase in savings, an increase in investment and hence rapid economic growth. Whilst in the pre financial liberalisation period, the average proportion of the GDP invested was 19.6%, the proportion decreased to 15.5% after the financial liberalisation policy reaching as low as 9.5% in 1996. However, the proportion of GDP that is invested by Nigeria has been increasing since 1996 reaching 33.8% in 2008. On the other hand, the savings ratio which began on almost the same level as investments pre the financial liberalisation rate increased to about 27.3% in 1980 then tumbled to low of 5.0% in 1996 but recovered to 10.3% in 2001 then to 17.3% in 2008 (see figure 5.1). At the same time foreign direct investments (FDI) flow into the country increased from an average of 1.3% of GDP pre the policy to an average of 3.7% of GDP after the policy (see Table 5.1 above). One other positive outcome of the financial liberalisation is the increase in the capital flow and the consequent augmentation of the country's foreign exchange reserves. Prior to the policy, the stock of total reserves (minus gold) was $1,165m in 1987; this figure increased to $53,002m by the end of 2008. The increase in FDI could be attributed to several factors. One factor relates to the increase of investment in the oil industry, and especially the communication sectors of the economy and the flexible exchange rate regime following the implementation of the SAP.
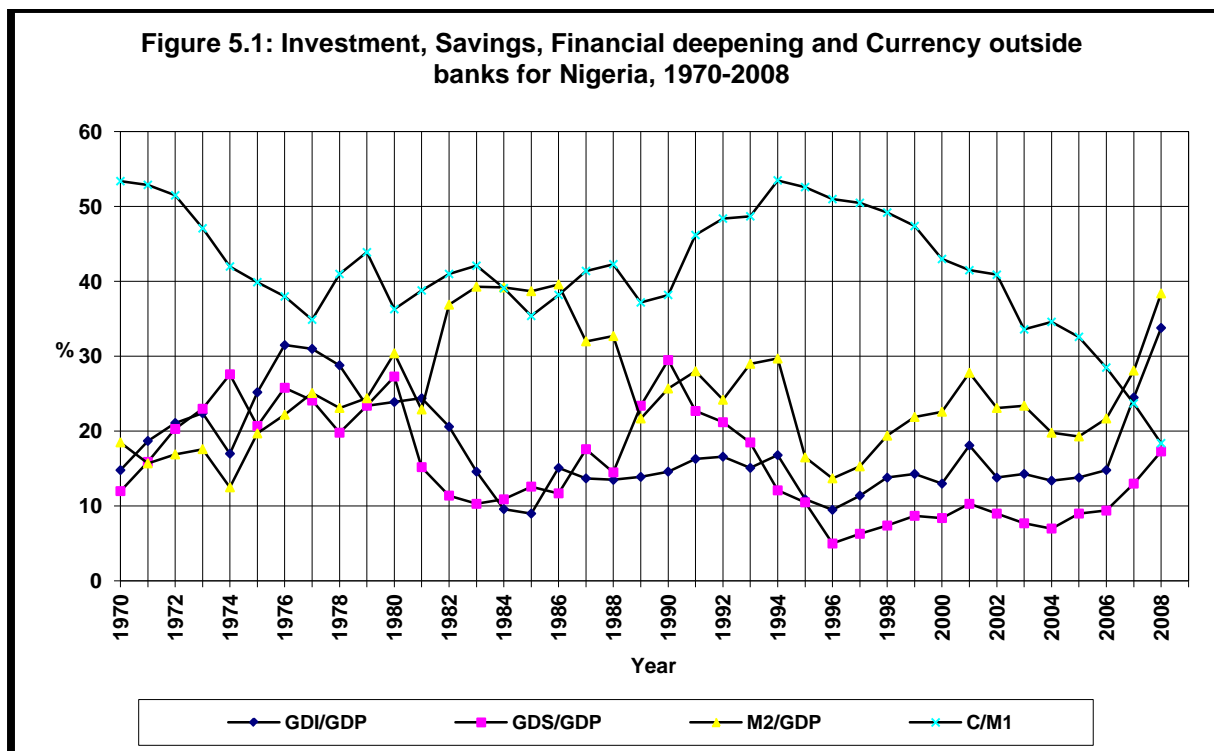
Figure 5.1: Investment, Savings, Financial deepening and Currency outside banks for Nigeria, 1970-2008

Note: GDI-Gross Domestic Investment, GDP-Gross Domestic Product, M2-Broad Money, M1- Narrow Money, GDS- Gross Domestic Savings.
Source: Compiled from World Bank, World Tables (2009); IMF, International Financial Statistics (2009) and Central Bank of Nigeria, Financial Statistics (2008).

Financial deepening, as measured by the ratio of M2 (money and quasi-money) to GDP as it could be observed from figure 5.2, started to increase in 1974 from 12.5% through to 39.6% in 1986, then dropped to as low as 13.7% in 1996 but stood at 38.4% in 2008. The pre liberalisation average stood at about 27.0% but decreased to about 24.0% after the policy. The reduction of 3.0% points may suggest that there has been a worsening of financial deepening post the financial liberalisation period. It is hoped that as the interest rate liberalisation programme stayed on course and the financial system matures, financial assets such as stocks and bonds (issued by both government and firms) will appear on the financial market and with growth in income and stability in the economy associated with the reduction in the countries risk premium, financial deepening may also increase. This is because (ceteris paribus), with increase in the real rate of return on financial assets, assets held previously in the form of say, large inventories, gold and livestock, will find their way into the formal financial system[33].

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[33] Note that the main aim of financial liberalisation is to cause a shift of savings from lower-productivity self-investment to higher productivity investment intermediated by the formal financial sector.

5.5.2 Interest rate liberalisation and sectoral credit allocation

As observed in Figure 5.2, there has been a tremendous change in the structure of credit allocated to the various sectors by the banks after the financial liberation policy. While before the policy, Agriculture, Forestry and Fishing (AFF), Manufacturing (M), Construction (C) and Trade and Commerce (T&C) were allocated on the average 6.0%, 25.2%, 16.5% and 24.6% of the total credit respectively, the post financial liberalisation period saw an average of 10.9%, 28.7%, 3.7% and 14.5% for Agriculture, Manufacturing, Construction and Trade and Commerce respectively. The data seems to suggest that the sector that has benefited most as a result of the interest rate liberalisation is the Miscellaneous (MIS) sectors from an average of 8.8% to 31.8%. The worse-off sector is the Construction sector with a fall of 12.8% points. Like the case of Ghana, the question that may follow is, "Does this change in the composition of the credit allocation and reflect an increase in the efficiency in credit allocation?"

Figure 5.2: Sectoral allocation of credit by commercial banks in Nigeria between 1970 - 2008.
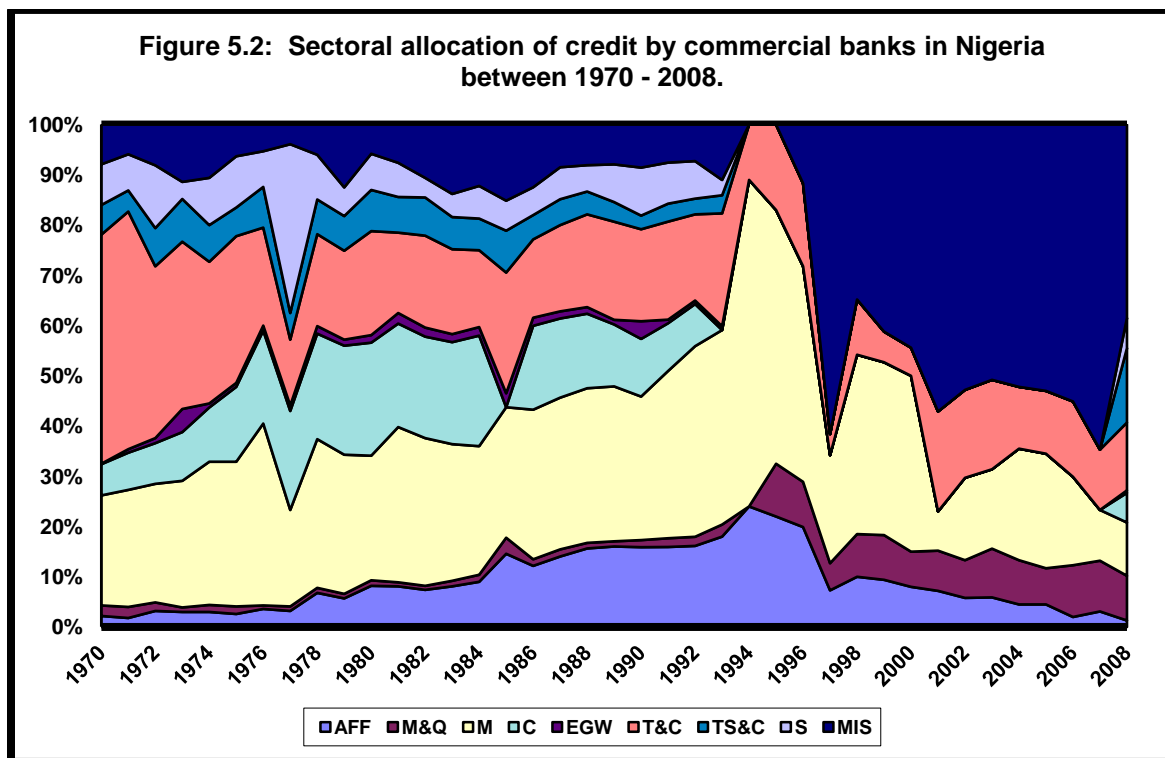
Notes: AFF - Agriculture, Fishing and Forestry; M&Q - Mining and Quarrying; M- Manufacturing; C - Construction; EGW - Electricity, Gas and Water; T&C - Trade and Commerce; TS&C - Transport, Storage and Communication; S - Service; MIS - Miscellaneous.
Source: Compiled from Central Bank of Nigeria's Financial Statistics (2008).

According to the World Bank (2002), the bulk of the credit that was channelled to the private sector was mainly directed towards short-term investment. Long-term finance was very rare and only the most creditworthy have access to it (World Bank, 2002). The private sector, especially the small and medium enterprises (SMEs) are yet to feel the impact of the financial liberalisation policy. As Ajayi (2007) observed, the anticipated flow of funds from the banking sector to the real sector, which was one of the thrusts of the government policy, is yet to manifest on the economy, especially on SMEs, with the current tendencies of the financial sector reflecting high preferences for large enterprises. The banks were reluctant to give loans to the private sector, especially SMEs, not because the sector is not viable, but due to the perceived risky nature and lack of government guarantee schemes (Obamuyi, 2009).

According to Obamuyi (2009), in 1992 the proportion of total bank credits that were extended to the SME was 48.8%. The proportion has been falling drastically since then reaching 2.7% in 2005. Since 2005, it has fallen further to a low of 0.2% as at 2008. The implication is that the financial liberalisation policy has not generated enough funds for the development of private sector-led economy. This means that government objective of using private sector as a catalyst of development may not be easily achieved.

Like in Ghana, the allocative efficiency of credit in an economy can be measured in several ways; the best is probably to compare marginal returns on capital investment across different sectors of the economy. If the marginal returns in different sectors are equal, then one may say that the economy allocates credits efficiency on the assumption that risk, uncertainty and transaction cost are kept constant. Due to data non-availability, it was difficult to obtain accurate estimates of marginal return on credits in different sectors of the Nigerian economy. One alternative was to compare the cost of credit in different sectors on the assumption that firms, in order to maximise profit equate their marginal cost of capital and marginal rate of return on investment. It is hypothesised that credit allocation in an economy has become efficient (or at least more efficient), if borrowing costs in different sectors of the economy are equalised (or differences in borrowing costs are reduced).

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Following this conceptual framework, the following calculations on the Nigeria sectoral borrowing cost were made. The borrowing cost of each sector was calculated between 1971 and 2008, by dividing total interest and discount payments by the total amount of debt in each sector, which included all sources of borrowing[34]. The variation in the borrowing cost reflects the differential borrowing cost for different sectors offered by the banks. Under the assumption that with an increase in efficiency in credit allocation, the variance of borrowing costs of the sectors should reduce, the following results, as shown in Table 5.2, were obtained. The results from Table 5.2 show that the variances before interest rate liberalisation were relatively smaller between 0 and 2.83 with an average of 1.7. The situation after the financial liberalisation, however, shows a relatively wide variation, reaching a high of 11.86 in 1993 with an average of 2.4 for the period. This may suggest that credit allocation post the financial liberalisation is less efficient than before the policy. Like Ghana, the results obtained must be interpreted with caution, since the underlying assumptions of the concept used in the analysis are strong[35]. One should also note that it is not clear whether a lower variance of cost of borrowing between sectors is indicative of allocative efficiency and also no adjustment for sectoral risks were made in the calculations.

Table 5.2: Cost of borrowing (credits) of different sectors of the Nigerian economy

Year	Average[a] (%)	Variance	Year	Average[a] (%)	Variance
1971	7.00	2.12	1990	25.60	1.48
1972	7.00	2.12	1991	20.01	0.56
1973	7.00	2.12	1992	29.80	0.99
1974	7.00	2.12	1993	19.32	11.86
1975	6.00	2.12	1994	21.60	0.42
1976	6.00	2.83	1995	20.10	0.49
1977	6.00	0.00	1996	19.74	0.79
1978	7.00	2.83	1997	13.54	6.92
1979	7.50	2.47	1998	18.29	2.16
1980	7.50	1.41	1999	21.32	4.15

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[34] Again because of non-availability of data, I used the average cost of borrowing in each sector instead of marginal cost of borrowing.
[35] Of course, in practice, different sectors have different risk, uncertainty, and transaction cost and therefore borrowing cost may not equalise.

Year	Average[a] (%)	Variance	Year	Average[a] (%)	Variance
1981	7.75	1.59	2000	17.98	2.52
1982	10.25	1.06	2001	18.29	2.16
1983	10.00	1.06	2002	24.85	3.78
1984	12.50	0.35	2003	20.71	1.53
1985	9.25	1.77	2004	30.25	1.16
1986	10.60	0.99	2005	17.95	1.09
1987	17.50	1.20	2006	17.26	1.02
1988	16.50	0.78	2007	17.94	0.90
1989	28.80	2.97	2008	15.94	1.84

[a] All are end of year average figures

Source: Own calculation from Central Bank of Nigeria, Financial Statistics (2008).

An additional contributing factor could be that the presence of moral hazard cost of borrowing is likely to expand, leading to increased distress borrowing, increased probability of default and bank failure (McKinnon 1989). This refers to a situation where banks prefer to be risk lovers and provide risky loans with high interest rates in expectation that losses will be covered by the domestic government while gains would accrue to themselves (McKinnon, 1989). The above evidence and reasons may suggest that, even though the volatility of borrowing cost among different sectors of the economy has increased under the interest rate liberalisation policy relative to before the policy, leading to less efficiency in the allocation of credit, the cause cannot be put solely on the financial liberalisation policy per se, but also on some political and socio-economic problems inherent in the Nigerian financial system as a whole.

According to Obamuyi (2009), although the majority of SMEs[36] are either very, or fairly, satisfied with the liquidity position of their banks, the stringent lending conditions, including various astronomical charges, have made banks' finance unattractive to the private sector. About 80% and 69% of the private business operators are dissatisfied with the lending conditions and high cost of funds of the banks respectively. The issue, therefore, is that the banks are liquid and ready to lend, but the private sector is reluctant to borrow because of the high transaction costs

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[36] *About 92.7%*

and other lending bottlenecks. This has the implication of restraining private sector investment, and ultimately retarding economic growth.

5.5.3   Interest rate liberalisation and Economic growth

According to McKinnon and Shaw, the ultimate goal of interest rate liberalisation is to generate rapid economic growth.   As can be seen from Table 5.3, annual average GDP growth pre liberalisation was 0.3%[37] but after the policy, the economy was growing at an average rate of 4.8%. One may also notice that the growth rates before financial liberalisation were not steady, with a number of years recording negative growth or shrinkage. There were seven years between 1975 and 1987 when negative rates were recorded (the economy shrank) some as low as negative 13.0% (1981) and some years recording positive rates as high as 10.0% (1985). However, the post policy period has seen constant positive growth rates or no growth from 1988 through to 2008. Some recorded as low as 0.0% in 1994 and some years recording rates as high as 11.0% in 2004.

Table 5.3: Some Selected Macroeconomic Indicators for Nigeria between 1975- 2008

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI),%	Trade Balance (% of GDP)
1975	-5.0	34.0	n/a
1976	9.0	24.0	n/a
1977	6.0	15.0	7.5
1978	-6.0	22.0	-3.2
1979	7.0	12.0	10.4
1980	4.0	10.0	17.5
1981	-13.0	21.0	-1.9
1982	-0.5	8.0	-5.5
1983	-5.0	23.0	-3.1
1984	-5.0	18.0	10.6

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[37]*This is b*ased on the average from 1975 to 1987.

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI),%	Trade Balance (% of GDP)
1985	10.0	7.0	19.9
1986	3.0	5.4	9.6
1987	-1.0	11.0	14.8
Average	**0.3**	**16.2**	**7.0**
1988	10.0	55.0	11.0
1989	7.0	40.9	17.5
1990	8.0	7.5	30.4
1991	5.0	13.0	16.3
1992	3.0	45.0	14.1
1993	2.0	57.0	15.2
1994	0.0	57.0	12.5
1995	2.0	72.8	12.5
1996	4.0	29.0	27.4
1997	3.0	6.0	15.7
1998	2.0	10.0	-0.7
1999	1.0	7.0	12.3
2000	5.0	6.9	22.6
2001	3.0	19.0	14.4
2002	2.0	13.0	8.0
2003	10.0	14.0	11.6
2004	11.0	15.0	22.5
2005	5.0	18.0	27.4
2006	6.0	8.0	18.4
2007	6.0	5.0	20.0
2008	5.0	12.0	14.8
Average	**4.8**	**24.8**	**16.4**

Source: Compiled from IMF, International Financial Statistics (2009); Africa Development Indicators, World Bank (2009) and the Central Bank of Nigeria, Financial Statistics (2008).

This is in conformity with the hypothesis, however, it could also be argued that the growth is not due to the financial liberalisation but rather it is associated with the increase in government borrowings from international organisations, increase in exports, accumulation of human capital, technological transfer, and accumulation of production experience.

Table 5.3 also shows that inflation has increased in the post financial liberalisation period as compared to the pre policy period. The average rate of inflation before the policy was 16.2% as compared to the post policy average of 24.8%. As it can be seen from Figure 5.3, Nigeria has recorded only one trade deficit after the implementation of the financial liberalisation policy and that was in 1998. During the pre-policy period, Nigeria recorded an average balance of trade surplus of 7.0% of GDP. The post liberalisation period has seen an increase in the average surplus of 16.4% of GDP (IMF, 2009).
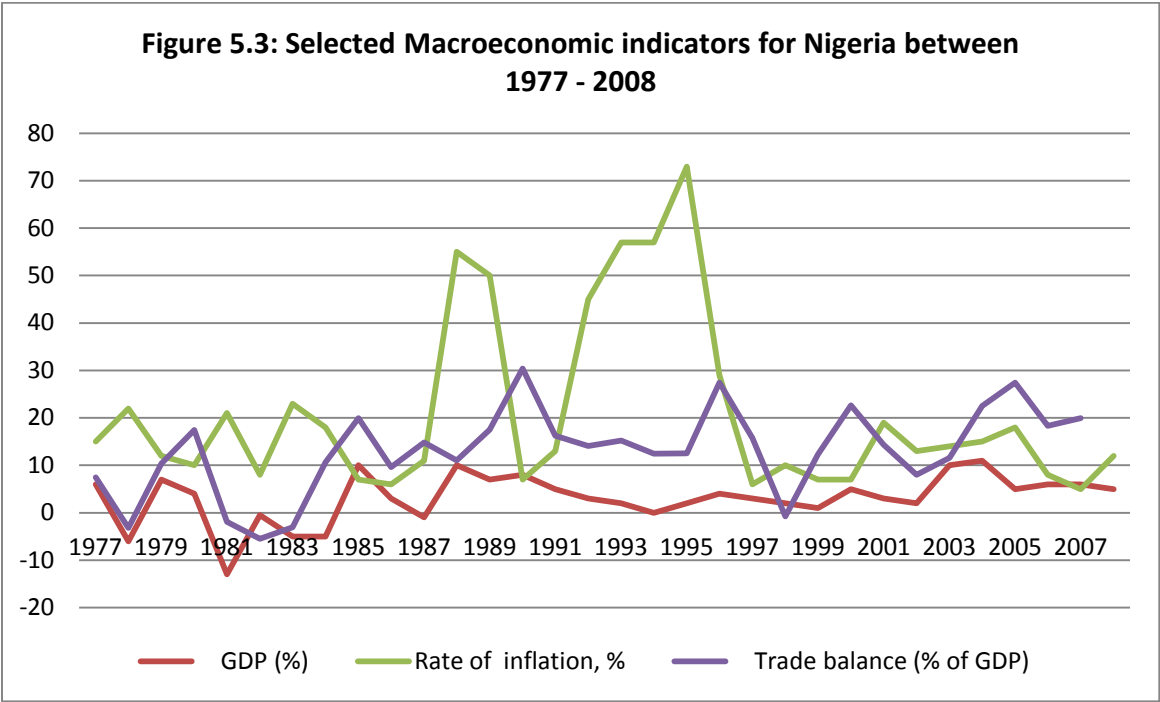
Figure 5.3: Selected Macroeconomic indicators for Nigeria between 1977 - 2008

Source: Compiled from IMF, International Financial Statistics (2009); Africa Development Indicators, World Bank (2009) and the Central Bank of Nigeria, Financial Statistics (2008).

5.5.4   Spreads between Lending and Deposit rates

As can be seen from Figure 5.4, the gap between lending and deposit rates in Nigeria has widened significantly since the interest rate liberalisation policy in 1986. Before the interest rate liberalisation, the spread between the lending and deposit rates fluctuated between 0.9% in 1987 and 4.0% in 1972 with an average for the period of 2.9%. About 3.5% spread was maintained between 1972 and 1981. This increased to 8.4% in 1993, then to 10.6% in 1997 but then reduced to 5.5% in 2004 before being increased to 7.4% in 2005. Following the implementation of the full interest rate liberalisation policy in 1986, the spread widened significantly from the previous high of 4.0% in 1972 to 5.8% in 1989. Between 1989 and 2008, the interest rate spread varied between post liberalisation low of 3.5% and a historic high 10.6% with an average spread of 6.9% for the period to 2008. Between 1997 and 2004, the interest rate spread increased dramatically from 10.6% in 1997 to 5.5% in 2004 but then increased to 7.4% in the following year before decreasing to 3.5% in 2008.

Figure 5.4: The spread between deposit and lending rates in Nigeria from 1972 to 2008
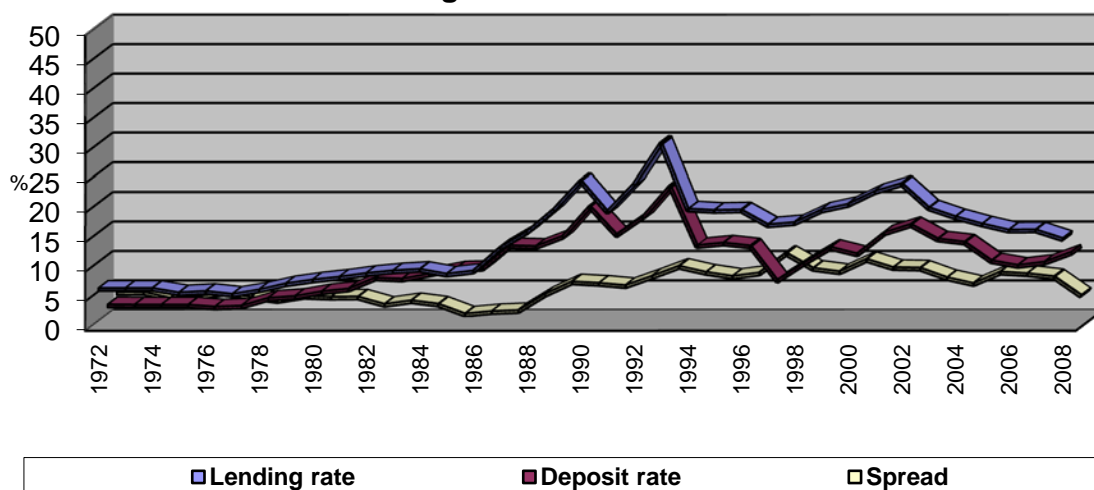
Source: IMF, International Financial Statistics (2009) and World Bank's Africa Development Indicators (2009).

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5.5.5 Interest rate liberalisation and foreign currency deposits

Like Ghana, the other side of the story is that the loss of confidence in the domestic currency (the Naira) led to an increase in foreign currency deposits. The main factor behind this loss of confidence is inflationary pressures leading to lack of budgetary discipline, combined with monetary financing and domestic debt financing. As a result of this, the private sector responded by demanding higher real interest rates on government securities as well as increasing their foreign currency holdings. Also, residents in Nigeria decided to hold part of their wealth in foreign currencies (especially US dollars) as a hedge against rampant inflation. As noted by Adebiyi (2005), the lack of harmony between fiscal and monetary policies hindered the effectiveness of monetary policies. There is a direct relationship between monetary and fiscal policies of governments. In most countries, fiscal deficit is financed through borrowing from the banking system. There is a serious implication when the proportion to be borrowed exceeds or is significant compared to what the Central Bank has accounted for. The magnitude and the pattern of government fiscal operations have been a major source of ineffective monetary control in Nigeria (Ojo, 2001)

A similar experience was seen in Ghana after interest rates liberalisation (see Chapter 4, section 4.5.5). It could be seen from Table 5.1 col. 2 that, whereas before interest rates liberalisation the proportion of total saving held in foreign currencies was nil, the post liberalisation period has seen an increase in the proportion of foreign currency from 0% to 5.1% on the average. This proportion stood at 12.2% in 2008 from its highest of 13.9% in 2005. This rapid increase in the proportion of savings held in foreign currencies is mainly due to the rapid depreciation of the domestic currency (the Naira) after the interest rate liberalisation policy. The naira depreciated by only 9.7% per annum compounded before the policy, however, it has depreciated by a massive 16.5% per annum compounded post the liberalisation period (i.e. between 1988 and 2008) against the US dollar. Other factors are related to social and political instability.

5.6 Capital account liberalisation, stock market development and economic growth

When the Structural Adjustment Programme (SAP) started in 1986, Nigeria already had a stock exchange. As part of the SAP, the exchange was modernised and fully deregulated in 1992. In 1995, foreign investors were allowed to participate in the capital market when exchange rate and financial markets were fully liberalised. However, these restrictions were removed when the capital account was fully liberalised in 1996. Now let's look at a brief history and current developmental issues of Nigeria's stock market (NSE, 2001).

5.6.1 Origins of Capital markets in Nigeria

The Nigerian Stock Exchange (NSE) was established in 1960 as the Lagos Stock Exchange. In December 1977 it became The Nigerian Stock Exchange, with branches established in some of the major commercial cities of the country. At present, there are six branches of the Nigerian Stock Exchange and each branch has a trading floor. The branch in Lagos was opened in 1961, the one in Kaduna was opened in 1978, that of Port Harcourt was opened in 1980, Kano's one was opened in 1989, the Onitsha and Ibadan ones were opened in 1990, that of Abuja was opened in 1999 and finally, the Yola branch was opened in 2002. Lagos also acts as the Head Office of the exchange. The exchange started operations in 1961 with 19 securities listed for trading. Today there are 262 securities listed on the exchange, made up of 11 Government Stocks, 49 Industrial Loan debenture or preference stocks and 194 equities or ordinary shares of companies, all with a total market capitalisation of approximately $49.0 billion, as at the end of 2008 (NSE, 2001).

According to the NSE, Most of the listed companies have foreign or multinational affiliations and they represent a cross section of the Nigerian economy. These companies range from agriculture through to manufacturing and services. The exchange has in place a tested network of stock brokerage firms and issuing houses from Merchant Banks, practicing corporate law firms to over 50 quality firms of auditors and reporting accountants most of which have links with international organisations. The Stock Exchange and most of the nation's stock broking

firms as well as the issuing houses are staffed with creative financial engineers who can compete anywhere in the world. As a result of this, the exchange has in place a network of intermediating organisations that can effectively and creditably meet the challenges and growing needs of all kinds of investors in the Nigerian economy (NSE, 2001).

The main index used by the exchange is the All-Share Index which was formulated and introduced in January 1984. Only the common stocks or the ordinary shares are included in the computation of the index. The index is value relative and is computed daily (NSE, 2001). Clearing, settlement and delivery of transactions systems used by the exchange are managed electronically by the Central Securities Clearing System Limited (CSCS), a subsidiary of the Nigerian Stock Exchange. The CSCS Limited ("the Clearing House") was incorporated in 1992 as part of an effort to make the Nigerian capital market more efficient and investor friendly. Apart from clearing, settlement and delivery, the CSCS Limited also offers custodian services (NSE website, 2010).

Various legislations have been passed to help run the exchange smoothly. These legislations include, for example, the Investments & Securities Decree 45, which was passed in 1990; the Companies and Allied Matters Decree, which was passed in 1990; the Nigerian Investment Promotion Commission Decree, which was passed in 1995 and the Foreign Exchange (also known as the Miscellaneous Provisions) Decree, passed in 1995, to mention a few. Transactions on the Stock Exchange are regulated by the Nigerian Stock Exchange, which acts as a self-regulatory organisation (SRO), and the Securities & Exchange Commission (SEC), which administers the Investments & Securities Decree, passed in 1999. After the deregulation and full liberalisation of the capital account in 1993, the Federal Government in 1995 internationalised the capital market, with the abrogation of laws that constrained foreign participation in the Nigerian capital market (NSE, 2001).

Following the abrogation of the Exchange Control Act 1962 and the Nigerian Enterprise Promotion Decree 1989, foreign investors can now participate in the Nigerian capital market, both as operators and investors. There are also no limits to the percentage of foreign holding in any company registered in the country. Prior to this development, the exchange had, since June

2, 1987, linked up with the Reuters Electronic Contributor System for online global dissemination of stock market information - trading statistics, All-Share Index, company investment ratios, and company news (financial statements and corporate actions).

In November 1996, the exchange launched its internet system (CAPNET) as one of the infrastructural supports for meeting the challenges of the internationalisation policy and achieving an enhanced service delivery. The internet system facilitates communication among local and international participants in the market, as subscribers to the system, which includes stockbrokers, quoted companies and issuing houses who now use the facility to receive and send e-mail, globally as well as locally. But more importantly, they can, through this medium, access key market information, for instance, trading statistics, both current and historical, and corporate trading results among a myriad of other trading statistics. As at the end of 2009, the All-Share index of the exchange stood at 20,827 while the market capitalisation was estimated to be about $49 billion with the number of listed companies standing at 216 (NSE, 2010).

5.6.2   Stock market developments and economic growth trends

Supporters of capital account liberalisation argue that implementation of the policy will lead to an increase in economic growth. As can be seen from Figure 5.5, it is not entirely clear whether the liberalisation of the capital accounts had led to the increase in economic growth levels. Since the year 2000 there has been a drastic increase in the gross domestic product from $46.0 billion to $212.1 billion in 2008, and a similar trend has been seen in stock market capitalisation figures.

Figure 5.5: Gross Domestic Product and Sock Market Capitalisation in Nigeria (1975 - 2008)
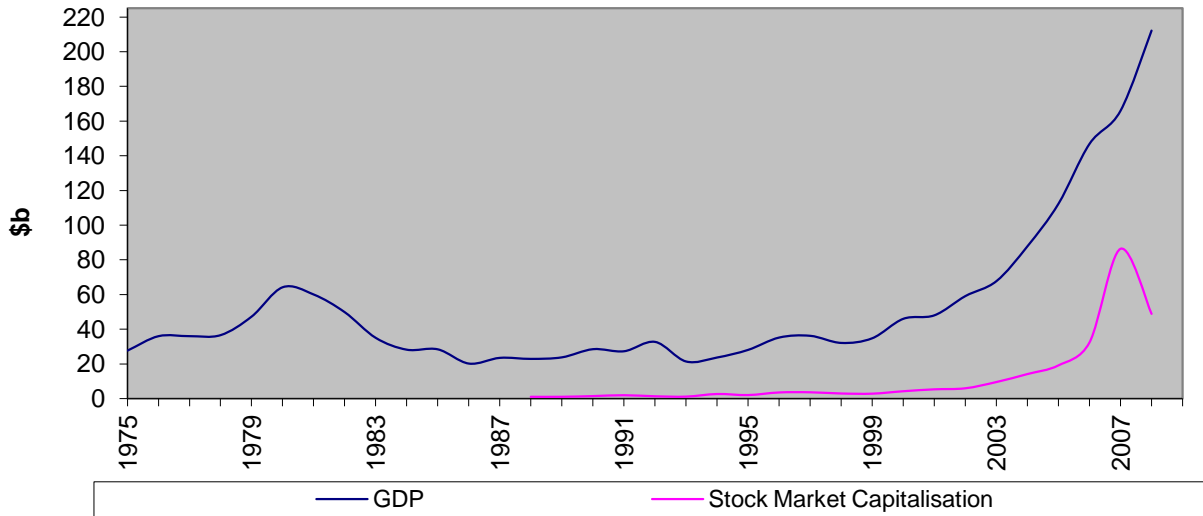
Furthermore, as can be seen from Figure 5.6, all the selected stock market development indicators i.e. stock value traded as a percentage of GDP, stock turnover as a percentage of market capitalisation and stock market capitalisation as a percentage of GDP, have similar trends to that of economic growth.

Figure 5.6: Ecomonic growth and Selected Stock market indicators for Nigeria (1988 - 2008)
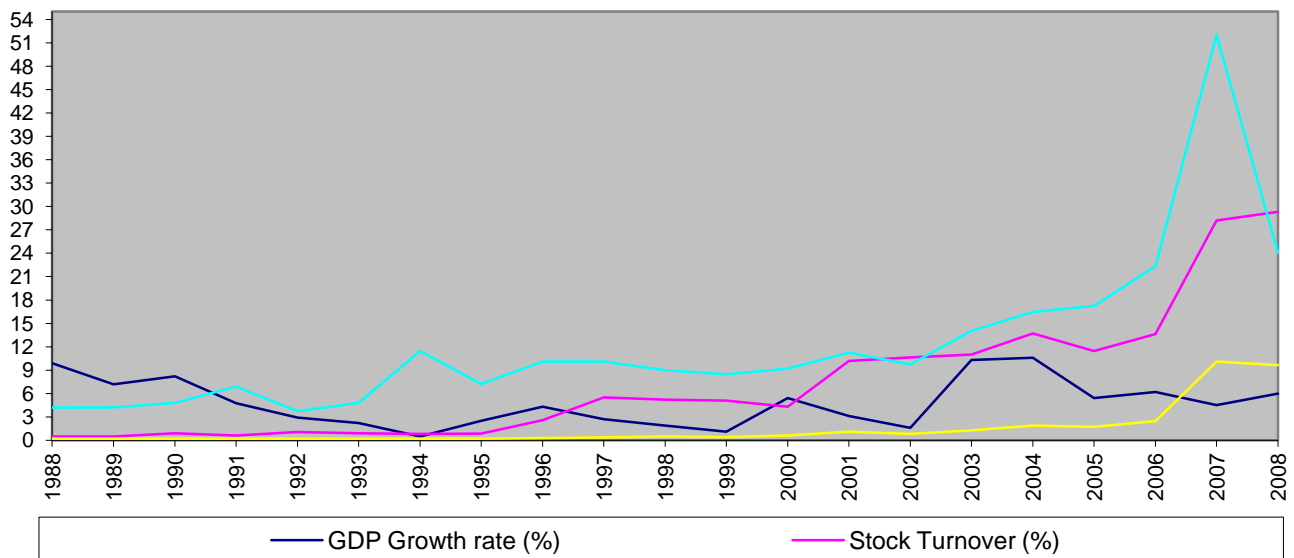
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As can be seen from Figure 5.6, the stock turnover ratio, which is an indication of the liquidity of the exchange, has been very low and relatively stable since 1988. It started at 0.5% in 1988 then increased to about 5.5% in 1997 then to about 10.7% in 2001. It then increased to 28.2% in 2007 then to 29.3% in 2008. The figure averages about 28.7% from 2007. The stock value traded as a percentage of GDP, GDP growth rates and market capitalisation followed the same trend as the turnover ratios. In all cases, the average figures have increased significantly since 2006.

5.6.3 Capital market development in Nigeria

Even though a very small market, by international standards, the Nigerian capital market is the biggest market in the ECOWAS sub region and has made some notable strides in recent years. However, with a history of over 50 years, equity listings and market capitalisation are still relatively small in comparison with other developing countries with such history and population. The Nigerian capital market is preponderantly an equity market. This is reflected in the number of company listings, market capitalisation and the trading values. Equities have consistently represented more than 95% of trading volumes and market capitalisation. The inclination of the market towards equities has partly accounted for the vigorous efforts to reactivate the bond market and promote derivative instruments. Apart from trading in right, which provides shareholders with opportunities to sell all or part of their rights in a rights issue, no derivatives are presently traded in the market. As a way of promoting more complex instruments as futures and options, a Standing Committee of the capital market on New Instrument Development was set up to examine and advise on new instruments (Ndanusa, 2003).

Bond market

The Nigerian bond market is emerging rapidly, despite its various limitations, as a viable form of investment. Corporate bonds were a common feature during the period leading up to the end of the 1980s. However, due to the recession suffered in the middle of the 1980s and as a result of the end of the oil boom, the number of corporate bond issues dried up quickly to a point where there were no such issues. Following the emergence of a democratically elected government in

1999, there has been a concerted effort by the authorities to revive the Nigerian bond market. The regulatory authorities must be applauded for making a strenuous effort to ensure that a fully functioning and viable bond market emerges from these reforms. From 2003, the Federal and State governments have both accessed the bond market on numerous occasions, primarily to finance budget deficits and to finance long-term capital projects such as road building and rehabilitation of decayed and neglected infrastructure after the lost decade of the nineties (Jackson et al., 2008). It will be a surprise to note that for 16 years before 2003, the Federal government did not play any part in the bond market in Nigeria. The totality of initiatives by the various regulatory bodies must however, only be seen as the first steps in the right direction (Jackson et al., 2008).

The apex capital market regulator in Nigeria, the Securities & Exchange Commission (SEC) in 2000 set up a committee to look into the problems of the bond market. In 2002, the SEC established the bond sub-committee under the Capital Markets Committee (CMC) to implement the bond market revival programme. The sub-committee has recently submitted its recommendation to the SEC. In its final report, the bond sub-committee identified the following problems in the establishment of a viable and substantive bond market (NSE, 2001). Thus:

- ✓ dearth of long-term savings;
- ✓ high cost of transactions in the Nigeria financial markets:
- ✓ low level of awareness in both the public and private sector;
- ✓ illiquidity as a result of the absence of a viable secondary market;
- ✓ instability in government policies;
- ✓ unfriendly macroeconomic environment, especially rampant inflation hikes;
- ✓ absence of yield curve for yields determination
- ✓ legal bottlenecks; and
- ✓ inadequate technical knowledge.

The bond sub-committee also identified the benefits that would emerge should a viable bond market develop. These include:

- ✓ use of bonds as instruments for the financing of infrastructural development projects;
- ✓ use of bonds as instruments for effective management of domestic debt;
- ✓ used of bonds as a source of stable and relatively cheap long-term finance for the private sector;
- ✓ bonds used as a viable investment avenue for individuals and institutional investors; and
- ✓ use of bonds as an avenue for the attraction of foreign investments.

In addition, the Federal government and the regulatory authorities have taken three important steps in ensuring that a bond market takes off. Firstly, the promulgation of the Pension Reform Act 2004, which essentially privatises the management and operation of pension schemes in Nigeria. This legislation forces employers in both the public sector and private organisations employing five or more staff to make pension contributions for their employees. The pension funds in turn are managed by Pension Fund Administrators (PEAs) licensed by the National Pension Commission (NPC) and the funds deposited with a pension fund custodian also licensed by the regulator. The total contribution from employee and employer must be a minimum of 15% of basic emoluments. It is estimated that in the next few years, US$7.8 billion will be realised annually and the PEAs will require products to invest the funds raised. For example, this was clearly illustrated in the last two weeks of August 2006 when the securities market saw a phenomenal rise due to excess capital chasing too few good stocks. It is envisaged that when the provisions of the Pension Reform Act are fully implemented, the requirement for products, including bonds and other avenues for funds, such as real estate investment trusts, will be even greater. Secondly, over the last few decades there has been a huge funding mismatch in Nigeria. This is due to the fact that, there has always been a heavy reliance on short term sources of funding for long-term developmental projects. For example, treasury bills with maturities of up to 90 days were the usual form of debt management undertaken by the public sector. These were generally rolled over for a further period of 90 days until the project is completed. Since 2003, the Debt Management Office (DMO) of the Federal government who are responsible for the issuing of Federal government bonds, has begun to shift the focus away from these short term treasury bills to longer tenure bonds of three to five years. The DMO recently issued a seven-

year tenure bond. Thirdly, the regulatory authorities have begun the process of creating a secondary market for bonds. This was seen in the recent appointment of primary dealers for government bonds by the DMO (NSE, 2010).

Equity market

Following the economic boom as a result of the discovery of oil in the 1970's, most enterprises were forced to look inward for raw materials and for funds. With increasing interest rates in the latter part of the 1980's in the capital market, it became one of the last hopes of many investors. This led to increasing patronage of industrial stocks and bonds listed on NSE. The number of stocks listed on the NSE grew from 14 in 1981 to 35 in 1998. At the same time equities, including those of the secondary securities, declined from 93 in 1981 to 51 in 1988. This decline was due to government's deliberate efforts not to float stocks again as from 1987, in order to allow markets to grow on their own. Following the continuing depth of meaningful foreign investments, the Nigerian Enterprises Promotion (issuing of debentures and preference shares) decree 34 of 1987 was promulgated in order to attract needed foreign investment in the country. In 1985 there was the establishment of the SSM (Secondary Securities Market). The SSM's dream was to make room for smaller indigenous companies, which could not meet the listing requirements of the primary companies to come to the market (NSE website, 2010).

The decade 1989 to 1990 is regarded as the fifth phase. Since the beginning of 1989, there has been a spate of activity following the privatisation exercise that brought new dimensions into the bond market. In preparation for the exercise, there has been a sudden increase in the number of operators (stock broking firms and issuing houses). The privatisation exercise has also brought many firms to be quoted on the exchange. For example, in 1990, the number listed on the exchange jumped to 127. The NSE itself had expanded its branches from three to six. The new floors include those at Kano, opened in 1989, Onitsha and Ibadan, both opened in 1990. The number of listed securities grew from nine in 1960 to 219 as at August, 1990; consisting of 45 federal government stocks, four state governments stocks, 38 industrial fixed interest securities and 122 equities. The SSM alone has 14 companies listed. Thus far, the growth of the market is reflected in the growing activities in terms of value and volume of transactions alone in the

market. For example, dealings in stock on the exchange also increased from 334 in 1961 to 22,496 in 1989 (Ologunde et al., 2006).

5.6.4 Challenges of the stock markets in Nigeria

Like Ghana, the following are the challenges that face the development of capital market in Nigeria. They include low liquidity, investor confidence and unpredictability of the market, price forecast and contracts and their enforcement. Each of these is discussed below.

Low Liquidity

The volume of trading that goes on in the exchange is very low. This can be seen from the rate of change in the main index of the exchange which has been stable for a long time, i.e. the stability of the index reflects the low liquidity of the exchange. This is also from the turnover ratios discussed in section 5.6.2. According to some observers, it is difficult to call it a stock market because of the low level of liquidity. To help ameliorate this problem, in November 1996, the NSE launched the internet system (CAPNET) as one of the infrastructural supports for meeting the challenges of internationalisation and achieving an enhanced service delivery. The internet system facilitates communication among local and international participants in the market, as subscribers to the system include stockbrokers, quoted companies and issuing houses who now use the facility to receive and send e-mail, globally and locally (NSE, 2001). This is likely to increase the correlation between Nigeria and the international capital market by making it easier for international investors to move funds. As the Nigerian stock market develops and becomes more liquid, it will be subject to the vagaries of the international market.

Investor confidence and unpredictability of the market

Despite the achievements chalked in the development of the capital markets in Nigeria, fluctuations and high interest rates, high rate of inflation and political instability or the continued depreciation of the domestic currency, have combined to make it difficult for investors to predict the long-term sustainability of the capital market. Hence, making it difficult to either invest or

borrow from the Nigerian capital market. Furthermore, an examination of the real return on the stock exchange by the Central Bank of Nigeria revealed that the total annual returns on stocks listed on the Nigeria stock exchange have followed an undulating pattern since it started trading in 1988 with high and low alternating every two years.

Contracts and their enforcement

For the derivative market to thrive it requires strong legal systems for enforcement of contracts. The legal system in Nigeria could not be said to have the capability to enforce such contracts. Beside this there is also the lack of robust financial regulations to ensure the disclosure of adequate information by participants in the capital markets. There is also not enough information available to investors to make investment decisions about the markets. These unfavourable conditions create lack of investor confidence. These are generally issues found in emerging economies like Ghana, Nigeria and Ivory Coast.

5.7   Sequencing of financial liberalisation in Nigeria

Like Ghana, Nigeria adopted a gradual approach to the liberalisation of interest rates and capital accounts, as can be seen in Table 5.4 below. As in Ghana, interest rates were first liberalised, then followed by the capital account with the domestic real sector being the first to be liberalised. The programme began with the establishment of a second-tier foreign exchange market (SFEM) in September 1986 as an auction-based forum for the sale and purchase of foreign exchange. The liberalisation of exchange rates was then followed in 1987 by the full deregulation of both deposit and loan rates. As Ikhide and Alawode (2001) point out, at the same time as interest rates were deregulated, conditions for licensing new banks were relaxed. In response, the number of banks increased dramatically, from 40 in 1986 to 119 by the end of 1991.

In 1988, permission was granted for the establishment of private foreign exchange bureaus. During the same year, efforts were made to give banks expanded powers in the range of assets and liabilities they could acquire. Banks were permitted to hold stock in non-financial enterprises and also to engage in insurance brokerage. Also, another important step was taken in 1988 with

the establishment of the Nigerian Deposit Insurance Corporation (NDIC), charged with the responsibility of enticing bank deposits by promoting public confidence in the safety of the banking system and protecting depositors' interests (Ikhide and Alawode, 2001). With this development, it was expected that financial stability would be maintained while progress was made with the other aspects of financial sector reforms. In 1989, further powers were given to the bank; powers to pay interest on deposits in an effort to mop up excess liquidity in the system. The cash reserve requirement was raised and the practice of granting loans using foreign exchange deposits held abroad or with a domestic bank as collateral was prohibited (Ojo, 1993). In preparation for the eventual removal of direct credit controls, the auctioning of Treasury Bills was commenced.

The year 1990 witnessed a series of measures designed to strengthen bank regulation and supervision in response to the rapid expansion of financial institutions and the perceived higher risk of bank failure. Firstly, the Central Bank started enforcing a risk-weighted measure of bank capital adequacy. Risk weighting is only in respect of perceived credit risk in each category of asset, including off balance sheet items. The structure of weights is essentially based on value judgements on the relative riskiness of asset categories in broad terms. Furthermore, in 1990 the Central Bank issued prudential guidelines for licensed banks to enhance the quality of their risk assets and the soundness of their operations. Among others, the guidelines require all banks to make adequate provisions for perceived losses based on portfolio classification so as to reflect their true financial positions. In order to detect any deterioration in the quality of credit portfolio early, banks were also given the mandate to review such credit portfolio on a continual basis (Ojo, 1993).

A summary of the financial reform policies which were taken or implemented after 1988 are shown in the table below. These include the liberalisation of interest rates, credit controls, cash reserve and liquid asset requirements, supervisory and prudential regulatory changes and exchange rate liberalisation, as well as capital account liberalisation. In 2004, to strengthen the banks' ability to provide credit to the private sector, the Central Bank of Nigeria announced a banking recapitalisation programme. This was aimed at increasing the minimum paid capital of the banks.

Table 5.4: Sequencing of financial Sector Reforms in Nigeria (1986 – 2008)

Year	Reform Policy
1986	▪ Two foreign exchange markets established ▪ Interest rate controls completely removed ▪ Bank licensing liberalised ▪ Foreign exchange markets unified
1988	▪ Foreign exchange bureaus established ▪ Bank portfolio restrictions relaxed ▪ Nigerian Deposit Insurance Corporation established
1989	▪ Banks permitted to pay interest on demand deposits ▪ Auction markets for government securities introduced ▪ Capital adequacy standards reviewed upward ▪ Extension of credit based on foreign exchange deposits banned
1990	▪ Risk-weighted capital standard introduced and banks' required paid-up capital increased ▪ Uniform accounting standards introduced for banks ▪ Stabilisation securities to mop up excess liquidity introduced
1991	▪ Bank licensing embargoed ▪ Central Bank empowered to regulate and supervise all financial institutions ▪ Interest rates re-administered
1992	▪ Interest rate controls removed once again ▪ Privatisation of government-owned banks begun again ▪ Capital market deregulation commenced ▪ Foreign exchange market reorganised ▪ Credit controls dismantled
1993	▪ Indirect monetary instruments introduced ▪ Five banks taken over for restructuring
1994	▪ Interest and exchange rate controls re-imposed
1995	▪ Interest rate controls modified ▪ Enactment of the abolition of Exchange Control Act 1962

Year	Reform Policy
	▪ Foreign exchange and financial markets liberalised.
	▪ Repeal of the Nigerian Enterprises promotion decree.
	▪ Restrictions on repatriation of dividends, profits, loan servicing payments and remittance of proceeds on sale of stock and other financial products were removed
2004	▪ Central bank of Nigeria announced recapitalisation of banks ▪ Banks increased their minimum paid up capital
2005	▪ Introduction of new micro financing policy by the Central bank of Nigeria
2006	▪ Start of recapitalisation exercise

Source: Compiled from various CBN publications and government proclamations and Ikhide and Alawode (1994) and author's investigations.

5.8   Conclusion

It can be concluded from the preceding facts that the financial liberalisation policy instituted under the SAP has had mixed results on the account that it has significantly reduced the black market for foreign exchange (foreign currencies can now be exchange through the forex bureaux and foreign currency account can be opened in the domestic banking system), increased foreign capital flow, improved the reserve position of the country, stabilised and propelled increased financial savings and prevented and reversed the falling financial deepening and resource mobilisation. According to Obamuyi (2009), the contribution of financial liberalisation to real GDP growth in Nigeria could only be marginal.

Also, Ogunmuyiwa and Ekone (2010), show that the effect of the financial liberalisation on economic growth in Nigeria can only be mixed. They supported their assertion on the fact that between 1971 and 1975, the growth rate of the economy measured by real GDP ranged from 21.3% in 1971 to 3.0% in 1975. They estimated that by 1981, the real GDP grew by 26.8% and remained negative until 1984[38]. Using a simple variance analysis, they show that between 1971 and 1986 the mean spread of GDP was 108.7. However, between 1986 and 1994, the real GDP

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[38] These figures are different from those shown in Table 5.3 because, they are based on the authors own estimations on information collated from various issues of the Central Bank of Nigeria Statistical Bulletin. See Ogunmuyiwa and Ekone (2010) for full exposition on these figures.

had a variance of 9.1. The variability of the real GDP growth was much higher before the financial liberalisation while it was lower after the policy was implemented.

Nevertheless, the financial liberalisation policy has brought with it a number of interrelated problems which would have to be addressed by the government. These include the large interest rate spread[39], increase in the amount of foreign currency deposit in the country, constant depreciation of the domestic currency, drastic increase in imports, and reduction of credits to the productive sectors of the economy. The share of private sector credits in the total credits is very low after the policy. This thesis is of the view that, as in the case of Ghana, in addition to lack of competition, other factors such as lack of information on loan terms available at other banks, unwillingness of the banks to reduce lending rates[40], cultural ignorance and high operational costs could explain this. To solve these problems the thesis suggests that: (i) the authorities must "guide." the interest rates by setting the margin; (ii) strictly enforce the law on the display of deposit and lending rates in the banking halls or failing that made to publish their rates in the newspapers; and (iii) the central bank in conjunction with the banks mount a public educational campaign on banking issues as well as microfinance and other forms of formal financial sectors. The extent to which the government should intervene in the financial market to "guide" credit is still under discussion. The discussion centres on whether government should only concentrate on creating "the rule of the game" and capacity building, while the market is allowed to freely determine sectoral allocation of credit, or whether it should go beyond that to partially intervene in the allocation of credits. It should, however, be noted that setting the margin is not the same as setting the ceiling. Here the authorities must allow the market to determine the rates, and then guide it by setting the margin. Another negative effect of the interest rate liberalisation, which the government should address as soon as possible, is the problem of high lending rates which have discouraged investment in the productive sectors like small and medium enterprises (SMEs) which are the engine of the economy in developing countries.

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[39] Real interest rates have worsened since the implementation of the policy.
[40] *See Obamuyi (2009)*

The case of Nigeria, however, supports the financial liberalisation hypothesis on the analysis so far[41]. This is because financial savings have increased post the policy. Financial deepening as measured by the ratio of money and quasi money (M2) to gross domestic product (GDP) and which was 32.0% before the financial liberalisation policy stands at 38.4% in 2008. Economic growth has been steady at an average of 4.8% after the financial liberalisation compared to 0.3% pre the policy. Investment, which was 13.7% at the beginning of the policy, stands at 33.8% of GDP in 2008 and savings which were about 17.0% before the policy have not changed since the policy. The only fly in the ointment is that the efficiency of credit allocation in the economy has suffered significantly. However, one cannot attribute this negative outcome to the financial liberalisation policy alone (see above). The other side is an interrelated bottleneck, rigidity and under-development of the Nigerian financial system as a whole.

The policy in Ghana and Nigeria has brought to light some of the weaknesses of the financial liberalisation hypothesis. It overlooks the issue of foreign currency deposit in the domestic banks and the monetary policies associated with such deposits. It therefore assumes a closed economy, which limits its applicability in open economies. However, recognising these drawbacks does not make the hypothesis deficient, but rather it tells us that policy makers can attempt to solve the problems in various ways by taking into consideration specifications of each country. Alongside financial liberalisation, particular attention should be given to institutional development and peculiarity of each country. Under normal circumstances, a country like Nigeria with a high degree of openness (41.4% in 1988 and 55.4% in 2007)[42] and successful financial liberalisation is envisaged to effect a shift of resources from foreign currency deposits to domestic currency deposits and from the component of the leakage to the formal financial sector because of increase in the deposits rates but instead one sees a strong condition for the phenomenon of foreign currency deposits. As showed in Table 5.1, foreign currency deposits stood at 0.0% of total deposits or financial savings in 1989. This has increased to 12.2% in 2008. Furthermore, using stock market capitalisation as a measure of capital accounts development, it can be seen from figure 5.5 that the relationship between capital account liberalisation and economic growth or development is not clear. As already mentioned, this is just the preliminary

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[41] A further empirical analysis using econometrical method, autoregressive distributed lag or the bounds testing approach will be performed in this thesis to investigate the impact further.
[42] *As* measured by the ratio of export and import to GDP.

analysis, the thesis employs an econometric method, autoregressive distributed lag (ARDL) to investigate any long-term relationship between the two indicators in subsequent chapters.

One positive aspect of the capital account liberalisation policy is the relatively large inflow of capital into the country. But while the sterilisation of the inflow capital is deemed necessary for ensuring the sustainability of capital, the cost of sterilisation and non-intervention in the foreign exchange market is feared to have jeopardised the fiscal programmes, and the high interest rate is feared to discourage investment in the real sector. Moreover, if Nigerians are discouraged from saving in the domestic currency because of fast depreciation in value, inadequate savings rate and lack of confidence in the banking system as a whole, then there is always the fear that they will change to holding their savings in foreign currency which is unfortunately the only reasonable option in Nigeria and most other developing countries due to the underdeveloped nature of the domestic financial market. This will aggravate the pressure on the exchange rates and lead to capital flight (if the domestic situation is perceived to be unstable). This could be averted through the stabilisation of the exchange rate and the development of capital markets to introduce alternative financial products such as stocks, corporate bonds, treasury bills and government securities. These products will provide good alternatives to the holding of foreign currencies and allow them to diversify their investments and minimise the risk of holding assets dominated in the domestic currency in times of unstable economic situations.

Chapter Six

Financial Liberalisation in Ivory Coast

6.1   Introduction

This chapter is the last of the three chapters that focus on the financial liberalisation policies as implemented in the selected ECOWAS countries. The experiences of these countries' financial liberalisation policies, as mentioned, will serve as a basis for the empirical investigation presented in chapters seven and eight. Like the chapters on Ghana and Nigeria, this chapter is sub-divided into eight sections. The second section looks at a short history of the banking system in Ivory Coast. The third section deals with the origins of financial repression and liberalisation in Ivory Coast. The fourth section is a discussion of the origin of interest rate liberalisation in Ivory Coast, whilst the section after that looks at the trends of the interest rates and financial savings in Ivory Coast before and after financial liberalisation. Section six looks at the challenges posed by interest rate liberalisation in the Ivorian economy. This section also looks at financial development, such as financial deepening and investment. It also investigates the influence of interest rate liberalisation on the sectoral allocation of credit in the Ivorian economy as well as trends of financial depth, interest rates, interest rate spread and economic growth before and after financial liberalisation together with the prevalence of foreign currency deposits in the domestic banks. In section seven, the origin of capital markets in Ivory Coast trends of capital account liberalisation and economic growth before and after financial liberalisation are analysed, and also challenges of the capital market are presented. Section eight presents a chronology of financial policy reforms that have been implemented since 1990, whilst in section nine, some concluding remarks are presented.

6.2   Brief history of the banking sector in Ivory Coast

Before we look at the origins of financial liberalisation in Ivory Coast, it is appropriate we look at the history of the financial system in Ivory Coast due to its peculiar nature among the three selected countries. Ivory Coast's banking and financial system developed during the colonial period as an extension of the French financial and banking systems. In 1962, Ivory Coast, along with seven other French speaking African countries, became members of the West African Monetary Union (Union Monétaire Ouest Africain - UMOA). The UMOA established the Central Bank of West African States (West African Economic Monetary Union - WAEMU), The WAEMU is responsible for issuing the African Financial Community (i.e. Communauté Financière Africaine - CFA Franc) currency which is the unit of currency for the member states (African Studies Centre, 1988).

WAEMU is responsible for the establishment of policies governing the financial system and interest rates in the member countries. In 1962, France and the members of the UMOA signed an agreement that guarantees the convertibility of the CFA Franc to that of the French Franc and established operational accounts for each member country with the French treasury in order to centralise their reserves. The signatories also agreed to the free circulation of capital within the union. Since 1962, the UMOA has modified its system gradually to grant greater monetary autonomy to the African member states. For instance, the UMOA reduced the share of French votes on the board of directors from one-third to one-seventh, transferred the headquarters of the WAEMU from Paris to Dakar in Senegal and in 1975, introduced changes to increase the managerial quota of Africans in their national economies and to help the member states make better use of their resources. Now let us look at the implementation of the financial liberalisation policies in Ivory Coast.

6.3   The origins of Financial Liberalisation in Ivory Coast

As in many African countries, Ivory Coast has, over the years, adopted the policy of financial sector intervention in the hope of promoting economic growth and development (World Bank, 1989). This included interest rate controls, directed credit to priority sector and securing bank loans at below market interest rate to finance deficits. These activities turned out to be detrimental to the domestic financial system, therefore stifling economic growth and

development. In the late 1980s, the financial system was especially hard hit by the fall in earnings from cocoa exports. This led to a massive liquidity crisis in the Ivorian financial system. In 1987, the Ivorian Bank for Construction and Public Works (Banque Ivoirienne de Construction et de Travaux Publics - BICT) and the National Savings and Loan Bank (Banque Nationale d'Epargne et Credit - BNEC) were closed by the authorities. In early 1988, the National Agricultural Development Bank (Banque Nationale pour le Dévelopment Agricole - BNDA), which provided credit to peasant farmers, and the Ivory Coast Credit Bank (Crédit de la Ivory Coast - CCI), an industrial development bank, suspended operations (African Studies Centre, 1988). Also, regulations governing credit allocations also discouraged local investment. Banks preferred high liquidity, which meant that short and medium term loans, that is loans repayable within a period of between one and five years, were granted only against short and medium term funds, effectively preventing loans to local and indigenous businesses, which in most cases lacked the financial resources. Thus, prior to the financial liberalisation, the majority of short and medium term credit in Ivory Coast went to foreign investors (African Studies Centre, 1988).

As a result of the above problems, in 1990, Ivory Coast liberalised its preferential discount rate followed by bank interest rate liberalisation (Montiel, 1995). Like in most African countries undertaking financial liberalisation policies, the policy in Ivory Coast tended to focus largely on the banking sector of the financial system. These were interest rate liberalisation, bank restructuring, privatisation of banks and bank liquidation. However, in the case of Ivory Coast, financial liberalisation mainly took the form of privatisation of banks, restructuring and bank liquidation, as well as strengthening of the banking supervision regime (Inanga and Ekpenyong, 2002).

6.4   The origins of interest rate liberalisation in Ivory Coast

In 1990, in the face of macroeconomic instability, liquidity crisis, balance of payment problems, internal political crises and internal inconsistent economic policies, Ivory Coast liberalised its preferential discount rate, followed by bank interest rate de-regulations. This was the first step to a structured liberalisation policy. However, Ivory Coast continued to have negative real interest

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rate after the liberalisation (Montiel, 1995). By liberalising the preferential discount rate, Ivory Coast was geared toward restructuring the financial sector, controlling inflation and then strengthening the external reserves positions. According to the IMF, in Ivory Coast, the government objectives under this interest rate liberalisation policy were to strengthen the financial sector by increasing domestic savings and boosting the competitiveness and efficiency of banking and financial institutions by streamlining the banking supervision regime. This entailed legal and regulatory reforms as well as the expansion of the range of financial services and instruments made available to private sector investors and depositors, and in particular through (a) the launching of the regional financial market; and (b) the development of decentralised, local financial institutions (IMF, 1996). Ivory Coast also took measures necessary to address the weaknesses noted by the Banking Commission regarding non-performing agriculture credits. In addition, the authorities helped to diversify financial instruments, so that the financial system can better allocate the long-term resources needed for investment by enterprises (IMF, 1996).

Like many other African countries, interest rate liberalisation was followed by such policies as bank de-nationalisation and restructuring together with tightening of prudential regulations and bank privatisation or liquidation in the same years as the liberalisation of interest rate (Montiel, 1995). In 1991, Ivory Coast removed controls on credits (IMF, 1996). The Ivorian financial sector is a bit narrow compared to that of Ghana and Nigeria. Currently it has about 29 banks and financial institutions with penetration of about 210 branches. In 1988, Ivory Coast established a stock exchange which traded as part of the domestic financial systems. However, in 1998 it was liberalised to allow for foreign investments by making it a regional stock exchange for the eight countries which are members of the WAEMU and share the same currency, the CFA (WAEMU website).

The financial liberalisation in the context of the Ivorian economy poses many interesting questions. This is because the policy took the form of both interest rate and capital account liberalisations, and unlike Ghana and Nigeria, Ivory Coast shares the same currency and stock exchange with seven other West African Countries. Like the cases of Ghana and Nigeria, a simple methodology used to assess the impact of the financial liberalisation on the Ivorian

economy in this chapter is a before-and-after test, which compares the average figures[43] pre and post the implementation of the financial liberalisation policy.

6.5   Interest rate liberalisation, financial savings and Interest rate trends

It is observed from Table 6.1 that total financial savings expressed as a percentage of GDP with banks in Ivory Coast increased continuously from 17.4% in 1969 to 25.1% in 1978.   This dropped to 15.9% in 1983 then bounced back to 23.2% in 1987 and 21.5% in 1991 before the initial liberalisation policy. However, the trend reversed from 1992 and financial savings dropping to a low of 12.8% in 1999. From 2002, financial savings as a percentage of GDP have been steady, reaching 19.9% in 2007. On average, as can be seen from Table 6.1, financial savings decreased by about 2.7% points during the post financial liberalisation period compared with the pre liberalisation period.

The other side of the story is that the increase of confidence in the domestic currency, CFA, which is shared by eight countries, led to a relative decrease in foreign currency deposits within the domestic banks.

Table 6.1: Financial savings, interest rates, foreign direct investment and exchange rate in Ivory Coast between 1969- 2008.

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate CFA per US Dollar ($)
1969	14.7	14.4	n/a	3.0	3.5	n/a	277.92
1970	16.6	12.9	n/a	3.0	3.5	2.1	276.03
1971	16.5	11.8	n/a	3.0	3.5	1.0	261.23
1972	14.6	14.3	n/a	3.0	3.5	1.0	256.05
1973	15.1	14.1	n/a	5.8	5.5	2.0	235.43
1974	20.8	12.6	n/a	5.8	5.5	1.1	222.22

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[43] Simple mean values.

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate CFA per US Dollar ($)
1975	17.5	15.4	n/a	5.9	8.0	1.8	224.27
1976	20.8	17.3	n/a	6.0	8.0	1.0	248.49
1977	26.2	9.3	12.0	6.0	8.0	0.2	235.25
1978	25.1	14.7	12.0	6.0	8.0	1.1	209.00
1979	20.2	19.7	12.0	6.0	8.0	0.8	201.00
1980	16.1	30.1	14.5	6.2	10.5	0.9	225.80
1981	17.0	27.0	14.5	6.3	10.5	0.4	287.40
1982	17.2	24.8	16.0	7.8	12.5	0.6	336.25
1983	15.9	30.1	14.5	7.5	10.5	0.5	417.37
1984	16.5	12.9	14.5	7.3	10.5	0.3	479.96
1985	23.9	12.5	14.5	7.3	10.5	0.4	378.05
1986	21.8	13.9	13.5	6.1	8.5	0.8	322.75
1987	23.2	17.5	13.5	5.3	8.5	0.9	267.00
1988	20.8	19.3	13.6	5.3	9.5	0.5	302.95
1989	21.7	21.0	15.1	6.4	11.0	0.2	289.40
1990	20.7	16.2	16.0	7.0	11.0	0.4	256.45
Average	**19.2**	**17.4**	**14.0**	**5.7**	**8.1**	**0.8**	
1991	21.5	14.0	16.0	7.0	11.0	0.2	259.00
1992	18.9	13.4	16.8	7.8	12.5	-2.1	275.33
1993	16.9	17.4	5.0	3.5	10.5	0.8	294.78
1994	18.4	13.8	5.0	3.5	10.0	0.9	534.60
1995	18.1	16.4	5.0	3.5	7.5	1.9	490.00
1996	15.9	15.6	5.0	3.5	6.5	2.2	523.70
1997	14.7	14.9	5.0	3.5	6.0	3.5	598.81
1998	14.6	16.5	5.0	3.5	6.0	3.0	562.21

Year	Total Financial Savings[a] (% of GDP)	Of which Foreign currency (%)	Nominal Lending Rate[b] (%)	Nominal Deposit Rate (%)	Nominal Discount Rate (%)	Foreign direct investment (% of GDP)	Exchange rate CFA per US Dollar ($)
1999	12.8	19.6	5.0	3.5	6.0	2.6	652.95
2000	13.8	18.9	5.0	3.5	6.0	2.3	704.95
2001	13.0	18.1	5.0	3.5	6.0	2.6	744.30
2002	16.9	12.0	5.0	3.5	6.0	1.9	625.50
2003	16.6	9.2	5.0	3.5	4.5	1.2	519.36
2004	16.8	10.5	5.0	3.5	4.0	1.8	481.58
2005	14.4	9.2	5.0	3.5	4.0	1.9	556.04
2006	16.8	12.4	5.0	3.5	4.3	1.8	498.07
2007	19.9	10.7	3.9	3.5	4.3	2.2	445.59
2008	17.1	10.3	3.9	3.5	4.8	1.7	471.34
Average	**16.5**	**14.1**	**6.1**	**3.9**	**6.7**	**1.7**	

Notes: [a] Demand, Savings and Time deposits.
[b] End of year average rates and figures from 1993 to 2008 are money market rates.
Source: Compiled from IMF, International Financial Statistics (2009); World Bank, African Development Indicators (2009); West African Economic Monetary Union – WAEMU (2009).

It could be seen from Table 6.1 col. 2 that, whereas before financial liberalisation the proportion of total financial savings held in foreign currencies was ranging between 9.3% in 1977 and 30.1% in 1983 with a yearly average of 18.2%, the post liberalisation figures ranged from 9.2% in 2005 and 19.6% in 1999 with a yearly average of 12.0%. This translates into a 6.2% point reduction in the proportion of deposit held in foreign currency in the post liberalisation period as compared to the pre liberalisation era. This decrease could be due to (in addition to the above mentioned factors) the fixation of the exchange rate of the CFA to that of the French Franc in the early years and later to the Euro and hence making it (the CFA) a convertible currency.

As can be seen from Table 6.1, interest rates have been on a downward slide since the interest rate liberalisation policy in Ivory Coast. Deposits rate started from 3.0% in 1969 but ended up on

7.0% before the policy in 1989 with a yearly average of 5.71%. After the implementation of the policy in 1990, the deposit rate went up to 7.6% in 1991 but went down to 3.5% the following year and settled at this rate until 2008. The average for the post liberalisation period is therefore 3.9%. This is about 1.8%% points lower than the pre liberalisation average. Furthermore, the discount and lending rates followed the same trend as the deposit rate, for example, the lending rate started at 12.0% in 1977 but in 1982, stood at 16.0%. It then dropped to 14.0% the following year. As at 2008, the rate is back at 16.0% with a pre liberalisation average of 14.0%. After the full interest rate liberalisation, the trend continued to be downwards consistently reaching 3.9% in 2008 with an average of 6.1% showing a reduction of about 7.9% points.

Comparing the real interest rates, it was found that while the average real deposit rate pre financial liberalisation was negative 2.9%; the figure was negative 1.1% after the implementation of the interest rate liberalisation policy, showing an increase of about 1.8% points[44] compared with pre liberalisation average. However, the lending rate did not follow a similar trend. The average real lending rate before interest rate liberalisation was 5.2% but reduces to 1.1% post liberalisation. This shows a reduction of about 4.0% points. This is in consonance with the McKinnon-Shaw hypothesis that removal of interest rate ceilings will lead to an increase in the real deposit rates and the reduction of the lending rates. The hypothesis therefore is verified in the case of Ivory Coast. Furthermore, total financial savings have increased but with decreasing portions being held in foreign currency. The policy outcome in Ivory Coast is therefore positive on the above basis.

Related to this is the undiminishing in the size of the underground market economy, as measured by the decrease in the ratio of currency outside banks to narrow money (M1). The average of the ratio of currency to M1 pre financial liberalisation was about 86.9% and that of the post financial liberalisation was about 85.5%. The small decrease of 1.4% points may suggest the magnitude of the average reduction in the underground economy. But it can be seen from Figure 6.1 that, since 2003, the ratio has been reducing, reaching 74.0% in the year 2004 and then stabilising around to 82.0% between 2005 and 2008. This probably is due to the fact that with increasing inflation over the period (see Table 6.2), demand for money has increased and therefore Ivorians

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[44] This was calculated by adjusting the average nominal interest by the average inflation.

chose to hold more cash rather than to deposit it with the banks. Also, this may suggest that the financial policy has not been able to provide other opportunities of investment avenues in the Ivorian economy.
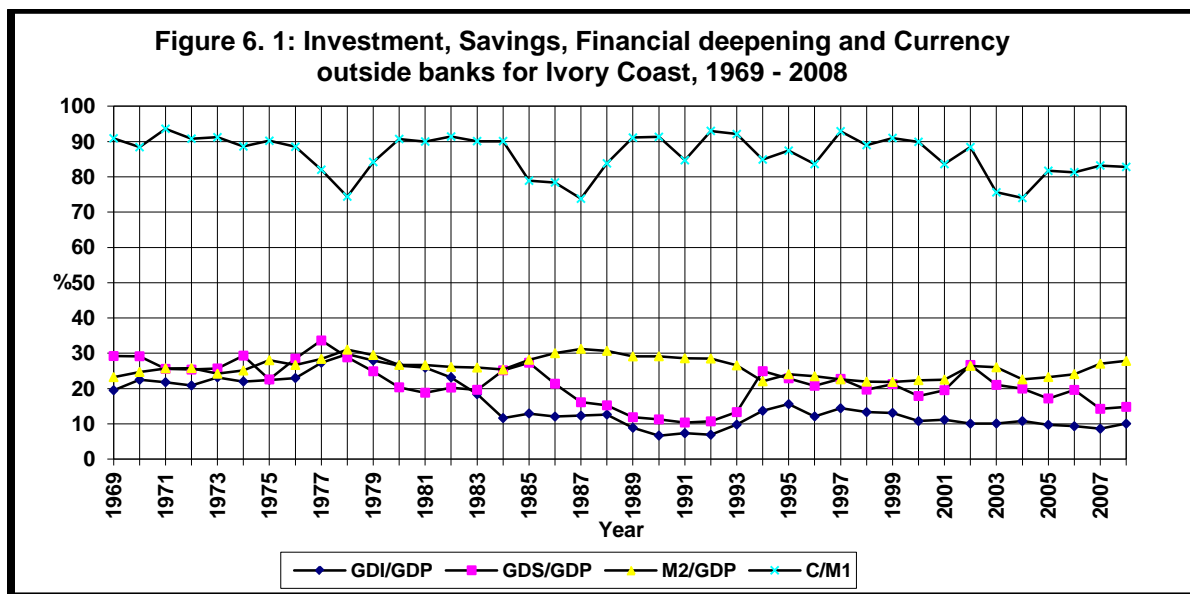
Figure 6. 1: Investment, Savings, Financial deepening and Currency outside banks for Ivory Coast, 1969 - 2008

Note: GDI-Gross Domestic Investment, GDP-Gross Domestic Product, M2-Broad Money, M1- Narrow Money, GDS- Gross Domestic Savings
Source: World Bank, Africa Development Indicators (2009) and IMF, International Financial Statistics (2009).

6.6   Challenges of interest rate liberalisation policy in Ivory Coast

Ivory Coast, a country in the ECOWAS sub-region which also depends on single commodity[45] for their export revenue, has faced a number of challenges since the implementation of interest rate liberalisation as part of the reforms of their financial systems. Apart from interest rates as discussed in the above section, some of the challenges that Ivory Coast has experienced since the implementation of financial liberalisation policy relate to the mixed financial savings, investment and financial deepening trends, changes in the sectoral allocation of credits, low economic growth rate in relation to financial depth, the relatively narrow spread between lending and deposit rates and amount of currency circulation outside the financial sector, suggesting a huge underground or informal market. These sets of challenges are discussed separately below.

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[45] Cocoa in the case of Ivory Coast. Ivory Coast is the world leading producer and exporter of cocoa beans.

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6.6.1 Interest rate liberalisation, Investment and Financial Deepening

The McKinnon-Shaw hypothesis postulates that financial liberalisation will lead to increase in savings, increase investment and hence rapid economic growth. In the case of Ivory Coast, while in the pre interest rate liberalisation period, the average proportion of the GDP invested was 19.6%, this reduced by 8.7% points to 10.9% after the implementation of the interest rate liberalisation policy. The proportion of GDP invested in Ivory Coast has been reducing since 1991, reaching a low of 8.67% in 2007. However, the figure recovered slightly to 10.1% in 2008. In the same vain, the savings ratio shows an average of 23.2% in pre interest rate liberalisation period, and then tumbled to an average of 18.8% during the post interest rate liberalisation era. Conversely, at the same time foreign direct investments (FDI) flow into the country increased from an average of 0.8% of GDP in the pre interest rate liberalisation to an average of 1.7% of GDP in the post liberalisation period (see Table 6.1).

One other positive outcome of the financial liberalisation is the increase in the capital flow and the consequent augmentation of the country's foreign exchange reserves. Prior to the interest rate liberalisation, the stock of total reserves (minus gold) was $4.0m at the end of 1990; the reserves increased to $2,252.1m by the end of 2008. The increase in FDI could be attributed to several factors. One factor relates to the discovery of large quantities of crude oil deposits in the country and the subsequent investment for its extraction. Also, the increased remittances from abroad through the official channels have contributed to the increase in the country's foreign exchange reserves, as well as the relatively stability in the prices of cocoa beans on the world market. Another factor that might be responsible for the increased FDI could be the relative political stability which has prevailed in the country since 2006 following the civil war.

Financial deepening, as measured by the ratio of M2 (money and quasi-money) to GDP, as observed from Figure 6.1, increased in 1969 from 23.3% through to 31.0% in 1978 then stabilised around 28.0% until the interest rate liberalisation in 1990 with an average for the period of 27.3%. From 1990, it was hovering around 28.0% then 26% then started to fall, reaching 22.6% in 2004. It has, however, started its recovery, reaching the pre interest rate

liberalisation average figures between 2007 and 2008. The figure stood at 27.8% in 2008. These levels are, however, still lower than the levels in the late 80's and early 90's but it is hoped that as the financial liberalisation programme stayed on course in Ivory Coast, the financial system will mature and financial assets such as stocks and bonds (issued by both government and firms), among others, will appear on the financial market and with growth in income. This will provide a myriad of investment options for the citizens leading to further financial deepening. This is because (ceteris paribus), with increase in the real rate of return on financial assets, assets held previously in the form of say large inventories, livestock land will find their way into the formal financial system[46].

6.6.2   Interest rate liberalisation and sectoral credit allocation

As observed from Figure 6.2, there was a tremendous change in the structure of credit allocated to the various sectors by the banks after the financial liberalisation. While before the interest rate liberalisation in 1990, Agriculture, Mining & Quarrying, Construction & Commerce, Manufacturing and Services were allocated on the average 27.4%, 1.0%, 7.4%, 12.3% and 52.0% of the total credit respectively, the post liberalisation period shows Agriculture with 22.7%, Mining & Quarrying with 1.0%, Construction & Commerce with 13.96%, Manufacturing with 16.5% and Services with 45.9%. The question that may follow, as with Ghana and Nigeria, will be, "Does this change in the composition of the credit allocation reflect an increase in the efficiency in credit allocation in Ivory Coast?"

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[46] Note that the main aim of financial liberalisation as postulated by the McKinnon-Shaw hypothesis is to cause a shift of savings from lower-productivity self-investment to higher productivity investment intermediated by the formal financial sector.

Figure 6.2: Sectoral allocation of credit by commercial banks in Ivory Coast between 1969-2008.
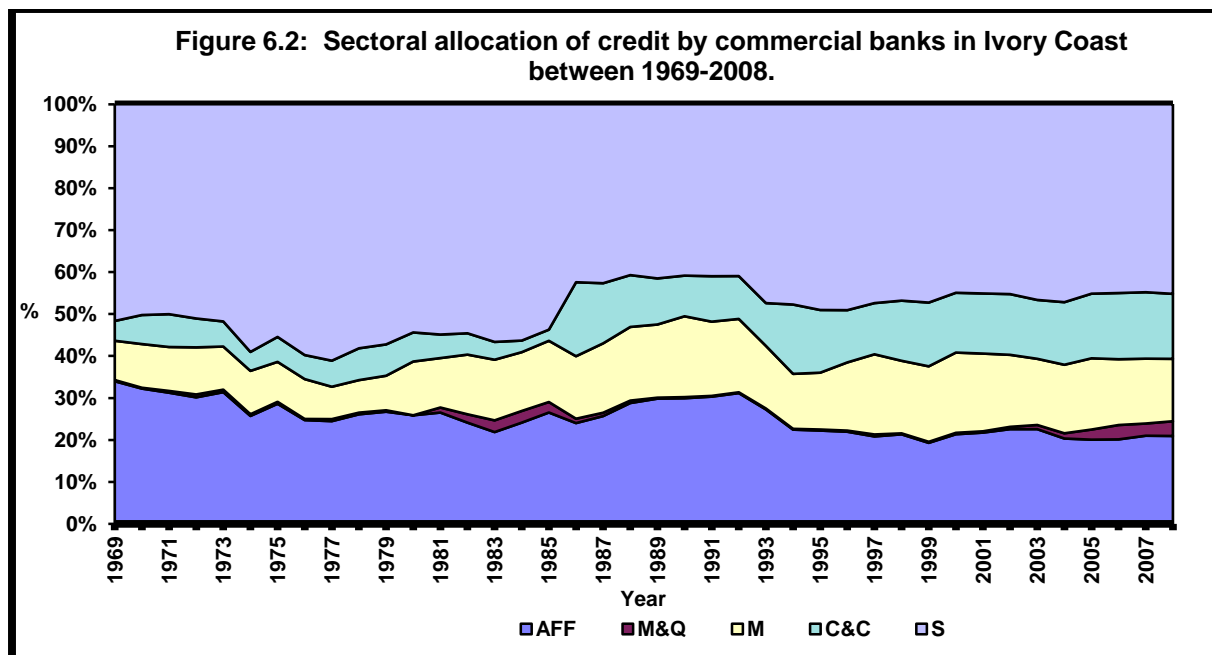
Notes: AFF – Agriculture M&Q - Mining and Quarrying; M- Manufacturing; C&C – Commerce and Construction; and S – Service. Source: Own Calculation from World Bank, Africa Development Indicators (2009).

According to the World Bank, the bulk of the credit that was channelled to the private sector in the developing countries after the implementation of the interest rate liberalisation was mainly directed towards short-term investment. Long-term finance was very rare and only the most creditworthy had access to it (World Bank, 2002). In most countries, the private sector, especially the small and medium enterprises (SMEs) are yet to feel the impact of the financial liberalisation policy. This is the case in Ivory Coast. The implication is that the financial liberalisation policy has not generated enough funds for the development of private sector-led economy. This means that government objective of using private sector as a catalyst of development may not be easily achieved. However, according to Graham (1996), claims on domestic credit shifted in favour of the private sector rather than the Government in Ivory Coast after the interest rate liberalisation policy. He estimates that borrowings by the central government in Ivory Coast were down by approximately 60% on the average relative to the pre interest rate liberalisation periods.

The allocative efficiency of credit in an economy can be measured in several ways; the best is probably to compare marginal returns on capital investment across different sectors of the economy. If the marginal returns in different sectors are equal, one may say that the economy

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allocates credits efficiency on the assumption that risk, uncertainty and transaction cost are kept constant. Due to data non-availability, it was difficult to obtain accurate estimates of marginal return on credits in different sectors of the Ivorian economy. One alternative was to compare the cost of credit in different sectors on the assumption that firms, in order to maximise profit, equate their marginal cost of capital and marginal rate of return to investment. It is hypothesised that credit allocation in an economy has become efficient (or at least more efficient), if borrowing costs in different sectors of the economy are equalised (or differences in borrowing costs are reduced). However, due to data unavailability, calculations for the allocative efficiency were not made either.

6.6.3   Interest rate liberalisation and Economic growth

According to McKinnon and Shaw, the ultimate goal of financial liberalisation is to generate rapid economic growth. As can be seen from Table 6.2, annual average GDP growth pre financial liberalisation in Ivory Coast was 3.7% a year, but in the post liberalisation period the economy was growing at an average rate of 1.6% per annum, a reduction of 2.1%. It is worth pointing out at this point that Ivory Coast has had political instability for most of the past decade and therefore the apparent decline in the economic growth rates could not be attributed entirely to the financial liberalisation policy changes. One can also notice that the growth rates before financial liberalisation were very unstable compared to the post liberalisation period. The growth rates before the liberalisation fluctuated between negative 11.0% and positive 12.9% whilst the post liberalisation period saw a range of between negative 3.7% and positive 7.7%. This is not in conformity with the hypothesis; however, it could also be argued that the reduction in growth may not be due to the financial liberalisation policy but rather with socio-political factors such as the civil war and political instability that ravaged the country in the early part of the 2000s as pointed out above.

Table 6.2: Some Selected Macroeconomic Indicators of Ivory Coast from 1969 to 2008

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI), %	Trade Balance (% of GDP)

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI), %	Trade Balance (% of GDP)
1969	9.5	4.5	9.7
1970	10.4	8.2	6.7
1971	9.5	-0.4	3.8
1972	4.2	0.3	4.5
1973	5.9	11.1	2.5
1974	4.3	17.4	7.3
1975	8.3	11.4	0.1
1976	12.9	12.1	5.5
1977	7.3	27.4	6.3
1978	10.9	13.2	-0.9
1979	2.4	16.3	-3.1
1980	-11.0	14.7	-6.2
1981	3.5	8.8	-7.1
1982	0.2	7.6	-2.9
1983	-3.9	5.6	1.2
1984	-2.7	4.3	13.5
1985	4.5	1.9	14.4
1986	3.3	9.7	9.3
1987	-0.3	6.9	3.8
1988	1.1	6.9	2.6
1989	2.9	1.0	3.0
1990	-1.1	-0.8	4.6
Average	**3.7**	**8.6**	**3.6**
1991	0.0	1.7	3.0
1992	-0.2	4.2	3.8
1993	-0.2	2.2	3.5
1994	0.8	26.1	11.2

Year	GDP growth rate (%)	Rate of inflation (as measured by CPI), %	Trade Balance (% of GDP)
1995	7.1	14.3	7.3
1996	7.7	2.5	8.7
1997	5.7	4.0	8.3
1998	4.8	4.7	6.4
1999	1.6	0.8	8.2
2000	-3.7	2.5	7.1
2001	0.0	4.3	8.4
2002	-1.4	3.1	16.6
2003	-1.6	3.3	10.9
2004	1.8	1.4	9.2
2005	1.3	3.9	7.5
2006	0.7	2.5	10.3
2007	1.7	1.9	5.6
2008	2.2	6.3	4.8
Average	**1.57**	**5.0**	**7.8**

Source: IMF, International Financial Statistics (2009) and World Bank's Africa Development Indicators (2009).

As can be seen from Table 6.2, inflation reduced on average after the financial liberalisation policy, the level is comparable to other African countries like Senegal and Niger[47] with whom Ivory Coast share the same currency. Figure 6.3 also shows that Ivory Coast has not recorded any trade deficit since the implementation of the financial liberalisation policy in 1990. Whiles during the pre-liberalisation period it recorded an average surplus of 3.6% of GDP per annum, the post liberalisation period has seen the average surplus doubling to 7.8% of GDP per annum.

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[47] For example the average inflation of Niger for the same period has been around 4.5% per annum whiles that of Senegal was 3.3% (Africa Development Indicators, 2009).

Figure 6.3: Some selected Macroeconomic Indoc ators for Ivory Coast between 1969 - 2008
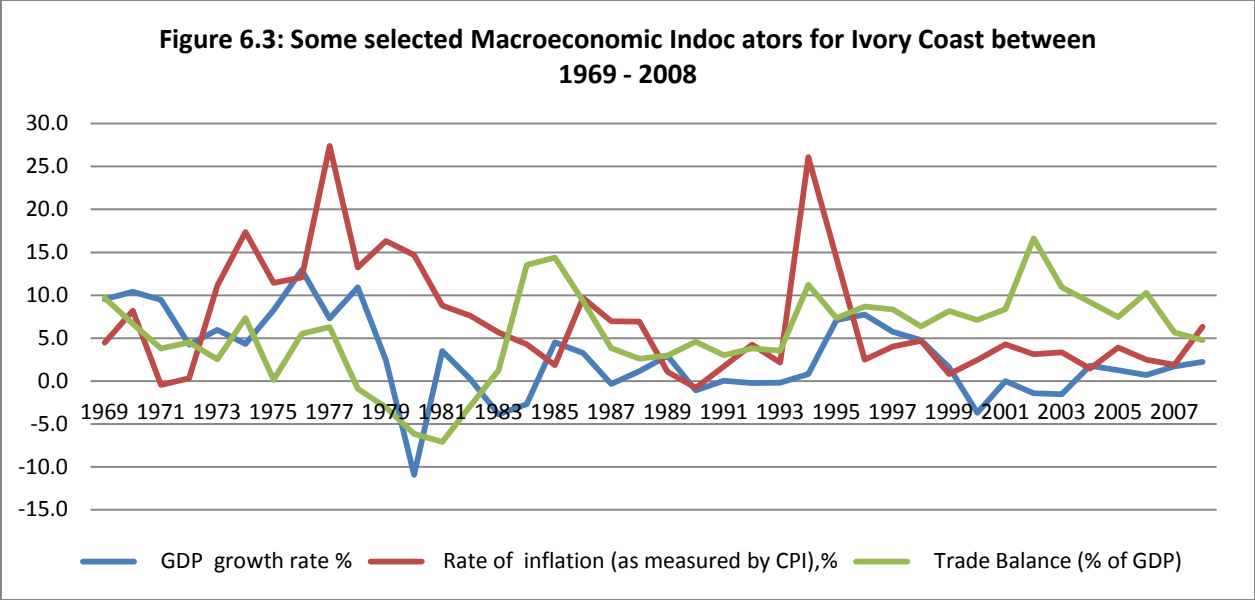
6.6.4   Spreads between Lending and Deposit rates

As can be seen from Figure 6.4, the gap between lending and deposit rates in Ivory Coast has narrowed significantly since the interest rate liberalisation policy in 1990. Before the interest rate liberalisation, the spread between the lending and deposit rates fluctuated between 6.0% in 1977 and 9.0% in 1990 with an average for the period of about 7.6%.
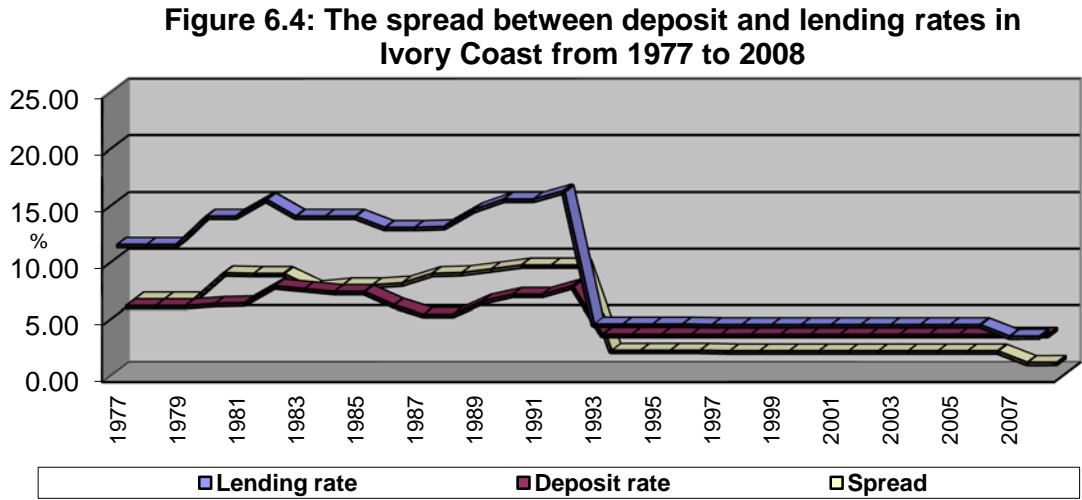
Figure 6.4: The spread between deposit and lending rates in Ivory Coast from 1977 to 2008

About 7.25% spread was maintained between 1983 and 1986. This increase to 8.25% in 1987, then to 9.0% in 1990 but then reduced to 1.5% in 1993 before settling at 1.45% from 1997 until 2008. Following the implementation of the interest rate liberalisation policy in 1990, the spread narrowed significantly from the previous high of 9.0% in 1990 to 1.45% in 1997. Between 1997and 2008, the interest rate spread stabilised at 1.45%.

6.6.5 Interest rate liberalisation and foreign currency deposits

Unlike Ghana and Nigeria, in Ivory Coast citizens did not lose confidence in the domestic currency, the CFA. This led to a reduction in foreign currency deposits in the domestic banks. The main factor behind this increase in confidence is the convertibility of the CFA and its fixation against the French Franc and then the Euro. As can be seen from Table 6.1 col. 2, whereas before financial liberalisation the proportion of total saving held in foreign currencies was about 17.35%, the post liberalisation period saw a reduction in the proportion of foreign currency by 3.3% points to 14.05% on the average. This proportion has, however, reduced further and stood at 10.3% in 2008 from its highest of 30.1% in 1983.

6.7 Capital account liberalisation, stock market development and economic growth

When the financial liberalisation policy started in 1990, Ivory Coast already had a stock exchange. As part of the policy, the exchange was modernised and fully deregulated in 1998 to turn it into a regional exchange for eight West African Countries. Accordingly, in 1998, foreign investors were allowed to participate in the capital market with all the benefit that such participation affords. Now let's look at a brief history and current developmental issues of Ivorian stock market.

6.7.1 Origins of Capital markets in Ivory Coast

The Ivorian stock market was created in 1973 and named Bourse des Valeurs d'Abidjan, hereafter called BVA. It was the only stock market in all the French speaking African countries

and has been trading stocks since 1973. The stock exchange market started with 22 listed companies. The number of listed companies, however, reached 35 in 1997 before the BVA was transformed into a regional stock market (BRVM). In 1994, when the CFA was devalued, the market capitalisation increased sharply and that trend continued until 1999 before dropping in following year due mainly to the military coup and the political instability that followed (N'Zue, 2006).

As mentioned already, the BVA is now called BRVM. Beginning 1991, a process of establishing a common stock exchange for the eight countries that use the CFA began. Following on from this, in 1996, the idea of establishing a common stock exchange was adopted by the Union Council of Ministers of the convention carrying creation of the Regional Council for Public Saving and Financial Markets (CREPMF). As a result of this, in 1996 the legal constitution of Regional Stock Exchange and Central Securities Depository was created and in 1998, a regional stock exchange and Central Securities Depository began operations (BRVM Website, 2010). In October 1997, the BVA was replaced by the West African Regional Stock Market (BRVM) and in September the BRVM started trading. Since its inception, the BRVM have chalked some significant changes and improvements in its operations. In line with that, in 1999, the stock exchange moved to electronically trading and decentralised its quotations systems. Furthermore in 2001 the exchange's started trading daily instead of only 3 days per week and in the year 2007; exchanges period of settlement was improved from trading plus 3 days instead of the trading plus 5 days settlements (BRVM Website, 2010).

There are two main indices of the Regional Security Exchange (BRVM). They are:

- The BRVM Composite which made up of all the listed shares
- The BRVM 10 which is made up of the 10 best valued shares.

The formulation and selection criteria of those indices are inspired by the principal world indices, in particular the CAC 40 index and from the International Financial Corporation, an affiliated company to the World Bank (BRVM Website, 2010). The calculation of the indices takes into account the market capitalisation, the volume of transactions per session and the frequency of transactions. In addition, only ordinary shares are included in the indices

calculations. Also, the notion of liquidity is very important to the selection of the values constituting the BRVM 10. Indeed, for each value, that is, the daily amount of transactions during the last three months before the quarterly review must not be lower than the average of the daily amounts of the whole values listed. The frequency of transactions must always be higher than 50% and the share must be exchanged at least once or twice during the observation period of three months (BRVM Website, 2010). The indices are generated by the BRVM negotiation system and broadcasted after each negotiation session. In addition, the BRVM 10 is reviewed four times a year (January, April, July and October) and the BRVM Composite is reviewed when a new company is listed on the exchange. This makes it adaptive to the evolution of the Regional Financial Market (BRVM Website, 2010). As at mid-November 2010, there were 40 companies and 33 bonds from all the participating countries listed on the exchange. The BRVM 10 and the BRVM Composite stood at 180.8 and 157.8 respectively while the market capitalisation was estimated to be about $6.2 billion at the end of 2009 (BRVM, 2010).

6.7.2   Stock market developments and economic growth trends

The implementation of capital account liberalisation policy is expected to lead to an increase in economic growth. As can be seen from Figure 6.5, it is not entirely clear whether the liberalisation of the capital accounts had led to an increase in the economic growth levels. Since the year 1975 there has been a drastic increase in the gross domestic product from $3.9 billion in 1975 to $23.4 billion in 2008, and a similar trend has been seen in stock market capitalisation figures. Furthermore, as can be seen from Figure 6.6, all the selected stock market development indicators i.e. stock value traded as a percentage of GDP, Stock turnover as a percentage of market capitalisation and stock market capitalisation as a percentage of GDP, have similar trends to that of economic growth.

**Figure 6.5: Gross Domestic Product and Stock Market
Capitalisation in Ivory Coast (1975 - 2008)**
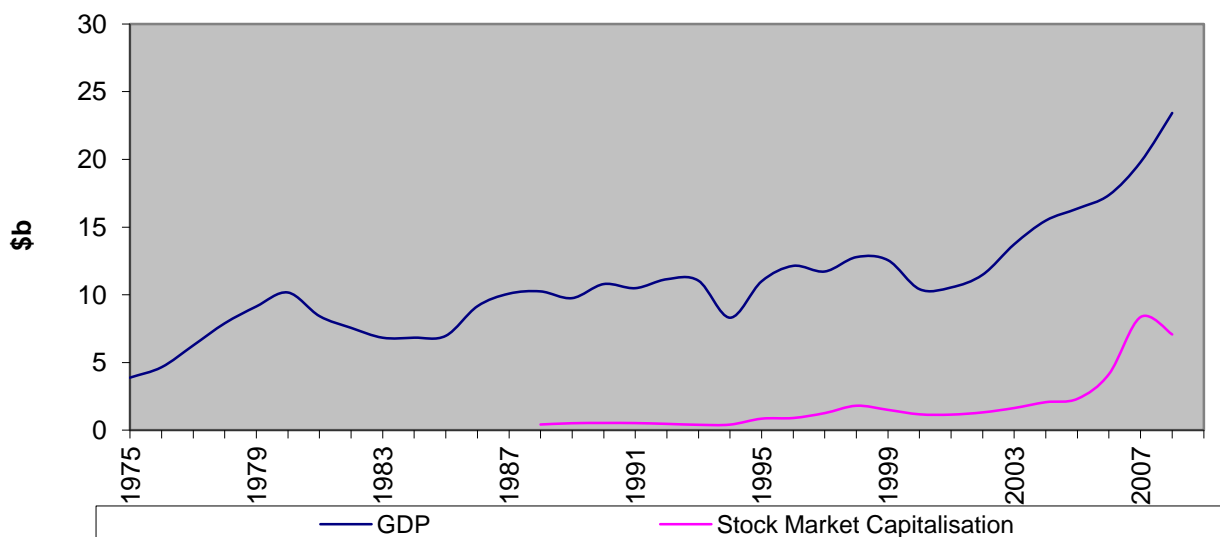
**Figure 6.6: Ecomonic growth and Selected Stock market indicators
for Ivory Coast (1988 - 2008)**
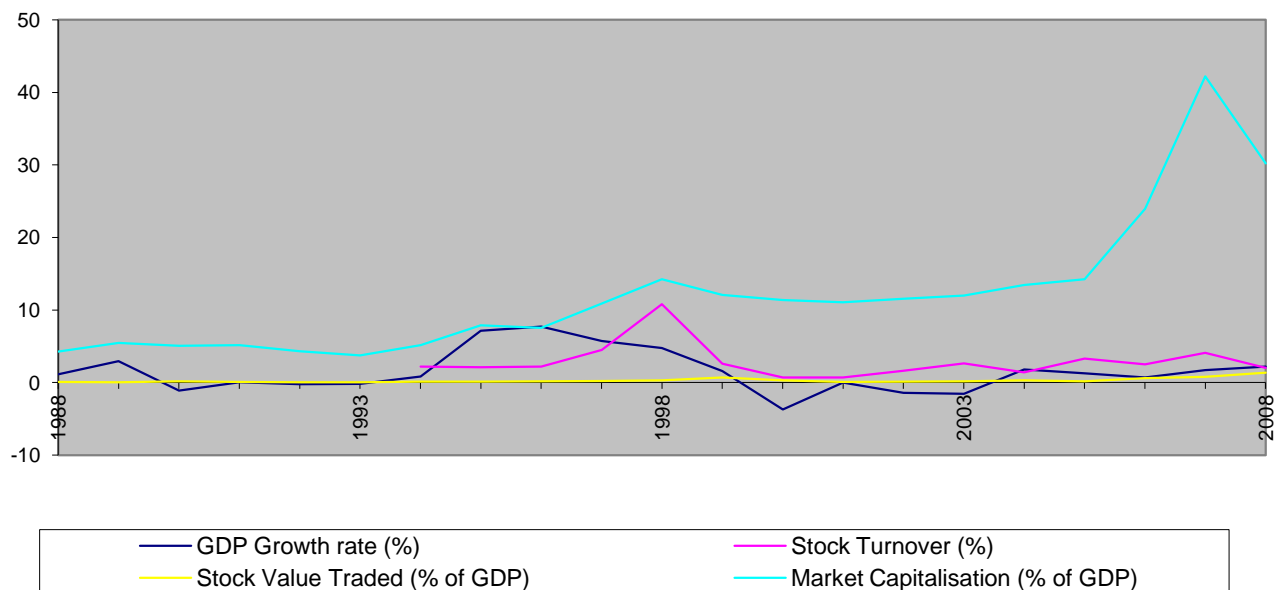
As can be seen from Figure 6.6, the stock turnover ratio, which is an indication of the liquidity of the exchange, has been very low and relatively stable since 1994. It started at 2.2% in 1994 then

increased to about 10.8% in 1998 then dropped to about 0.7% in 2000. It stabilised at its long-term levels between 2001 and 2006. It then increased to 4.1% in 2007 but then dropped to about 2.0% in 2008. The stock value traded as a percentage of GDP, GDP growth rates and market capitalisation followed a similar trend to the turnover ratios. In all cases, the average figures have increased significantly since 2006.

6.7.3 Challenges of the stock markets in Ivory Coast

Even though the stock exchange in Ivory Coast in practice is used by 8 countries in the ECOWAS sub region, the Ivorian capital market is small in terms of world standards as well as compared to other regional stock markets in the world. But, it has made some notable strides in recent years. The Ivorian capital market is mainly an equity market. There are, however, significant number of bonds listed on the exchange compared with Ghana and Nigeria. This is reflected in the number of company listings, market capitalisation and the trading values. Equities have consistently represented more than 60% of trading volumes and market capitalisation. The inclination of the market towards equities has partly accounted for the vigorous efforts to improve the bond market and promote derivative instruments in the future. Apart from trading in right, which provides shareholders with opportunities to sell all or part of their rights in a rights issue, no derivatives are presently traded on the market (BRVM Website). Some of the challenges that the exchange faces are similar to the stock markets in Ghana and Nigeria. Each of these challenges is discussed below.

Low Liquidity

The volume of trading that goes on in the exchange is very low. This can be seen from the rate of change in the main index of the exchange, which has been stable for a long time, i.e. the stability of the index reflects the low liquidity of the exchange. To improve on the liquidity, the electronically decentralised quotation system was introduced in all the regional offices of the exchange in 1999. This was followed by three trading days a week from 2001 and then settlement of transactions with three days instead of within five days in 2007 (BRVM Website). This is likely to increase the correlation between the Ivorian and the international capital market by making it easier for international investors to move funds. As the regional stock market in

Ivory Coast develops and becomes more liquid, it will be subject to the vagaries of the international market.

Investor confidence and unpredictability of the market

Despite the achievements chalked in the development of the capital markets in Ivory Coast, fluctuations and high interest rates, relatively high rate of inflation and political instability or the continued depreciation of the domestic currency, as well as civil war and political instability, have combined to make it difficult for investors to predict the long-term sustainability of the capital market. Hence, making it difficult to either invest or raise capital on the Ivorian capital market.

Contracts and their enforcement

For the derivative market to thrive it requires strong legal systems for enforcement of contracts. The legal system in Ivory Coast could not be said to have the capability to enforce such contracts. Beside this there is also the lack of robust financial regulations to ensure the disclosure of adequate information by participants in the capital markets. There is also not enough information available to investors to make investment decisions about the markets. These unfavourable conditions create lack of investor confidence. These are generally issues found in emerging economies such as Ghana, Nigeria and Ivory Coast.

6.8   Sequencing of financial liberalisation in Ivory Coast

As a consequence of the financial sector reforms instituted by the West African Economic Monetary Union (WAEMU) with the help of the IMF and the World Bank in 1990, Ivory Coast adopted a gradual approach to the liberalisation of interest rates and capital accounts, as can be seen in Table 6.3 below. In Ivory Coast, financial liberalisation concentrated on the banking sector. Major reforms were made in the provision of credits. To this end, inter bank credit ceilings were reformed. Interest rates were allowed to be determined by the market. This was allowed to shadow the Paris rate along with banking margins to improve banks profitability.

Some of the financial reform policies covered in the table include the liberalisation of interest rates, credit controls, cash reserves and liquid asset requirements, supervisory and prudential regulatory changes and exchange rate liberalisation as well as capital account liberalisation.

Table 6.3: Sequencing of financial Sector Reforms in Ivory Coast (1990 – 2008)

Year	Reform Policy
1989	▪ Council of Ministers of the West African Economic Monetary Union (WAEMU) decided to adopt the policy of financial liberalisation. ▪ Interbank ceiling on credit allocation and interest rates were relaxed.
1990	▪ The WAEMU abolishes its preferential discount rate. But control on interest rates remained. ▪ Liberalisation and rationalisation of interest rates. ▪ The creation of Bancaire. ▪ Restructuring, Privatisation and liquidation of banks.
1991	▪ Strengthening of the banking supervision arm with the creation of single supervision institute (Bancaire) in 1990. ▪ Controls on credit allocation removed.
1992	▪ Minimum deposit rate set ▪ Maximum lending rate set ▪ Interest rate spread between deposits and lending reformed.
1994	▪ Devaluation of the CFA.
1995	▪ Council of Ministers from the WAEMU countries agreed to set a regional stock exchange
1996	▪ Council of Ministers of WAEMU agreed the creation of the Regional Council for Public Saving and Financial Markets (CREPMF). ▪ Legal constitution of Regional Stock Exchange and Central Securities Depository was adopted.
1997	▪ The Ivorian stock market was replaced by the West African Regional Stock Market (BRVM).
1998	▪ Regional Stock Exchange and Central Securities Depository was liberalised and began their activities.
2001	▪ The OHADA (the Organisation for the Harmonisation of Business Law in Africa) and WAEMU council of Ministers adopted a uniform accounting system.

Source: Compiled from BRVM website, Inanga and Ekpenyong (2002), N'Zue (2006), Graham (1996), World Bank (1994) and author's investigations. Please note that the table was not meant to be an exhaustive list of all the financial reform policies.

6.9   Conclusion

It can be concluded from the preceding facts that the financial liberalisation policy instituted by the WAEMU with the help of IMF and the World Bank starting from 1989 to abolished its preferential discount rate, leaving banks interest rate to be determine by each member country, has had mixed results based on the data available on the account that interest rates have reduced significantly since the policy was implemented, there has been increase in foreign capital flow, improved reserve position of the country, stabilised but decreased financial savings and prevented and reversed the falling financial deepening and resource mobilisation. Its policy has also reduced the interest rate spread and lowered the lending and deposit rates.

Nevertheless, the financial liberalisation policy has brought with it a number of interrelated problems which would have to be addressed by the government. These include drastic increase in imports and reduction of credits to the productive sectors of the economy. The share of private sector credits in the total credits has been very low after the implementation of the policy. This thesis is of the view that, as with the case of Ghana and Nigeria, in addition to lack of competition, other factors such as lack of information on loan terms available at other banks and high operational cost could explain this. To solve these problems, the thesis suggests that the WAEMU in conjunction with the member countries and the banks mount a public educational campaign on banking issues as well as microfinance and other forms of formal financial sectors.

The case of Ivory Coast however, supports the financial liberalisation hypothesis on the analysis so far[48]. This is because financial savings have increase post the policy. Financial deepening as measured by the ratio of money and quasi money (M2) to gross domestic product (GDP) which was 27.3% on the average before the financial liberalisation policy and stands at 27.8% in 2008. These proportions are similar compared to that of Ghana and Nigeria. Economic growth has been lower at an average of 1.6% after the financial liberalisation compared to 3.7% pre the policy, but this could be explained in part by the fact that the country has gone through almost a

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[48] A further empirical analysis using econometrical method, autoregressive distributed lag or the bounds testing approach will be performed in this thesis to investigate the relationship further.

decade of political instability and civil wars, and therefore the decline is not due to the implementation of the policy alone. Domestic investment which averaged 19.6% at the beginning of the policy stands at 18.8% of GDP in 2005 and domestic savings which averaged about 23.2% before the policy have reduced to an average of 18.8% after the policy.

Once again, the policy in Ivory Coast as well as those in Ghana and Nigeria has brought to light some of the weaknesses of the financial liberalisation hypothesis, especially in the ECOWAS region. However, recognising these drawbacks does not make the hypothesis deficient, but rather tells us that policy makers can attempt to solve the problems in various ways by taking into consideration specifications of each country. Alongside financial liberalisation particular attention should be given to institutional development and peculiarity of each country. Under normal circumstances, a country like Ivory Coast with a high degree of openness, (47.1% in 1990 and 69.0% in 2007)[49] successful financial liberalisation is envisaged to effect a shift of resources from foreign currency deposits and other stocks, like livestock, to domestic currency deposits and from the component of the leakage to the formal financial sector. As already mentioned, this is just the preliminary analysis, the thesis employs an econometric method, autoregressive distributed lag (ARDL) to investigate any long-term relationship between the relevant indicators in subsequent chapters.

Like Ghana and Nigeria, one other positive aspect of the financial liberalisation policy is the relatively large inflow of capital into the country. But while the sterilisation of the inflow capital is deemed necessary for ensuring the sustainability of capital, the cost of sterilisation and non-intervention in the foreign exchange market is feared to have jeopardised the fiscal programmes and the relatively high interest rate is feared to discourage investment in the real sector. Moreover, if Ivorians are discouraged from saving in the domestic currency because of fast depreciation in value, inadequate savings rate and lack of confidence in the banking system as a whole, and political instability and civil wars, then there is always the fear that they will change to holding their savings in foreign currency and other commodities, such as livestock, which is unfortunately the only reasonable option in Ivory Coast and most other developing countries due to the underdeveloped nature of the domestic financial market or system. Like in the cases of

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[49] *As* measured by the ratio of export and import to GDP.

Ghana and Nigeria, this will aggravate the pressure on the exchange rates and lead to capital flight (if the domestic situation is perceived to be unstable). This could be averted through the stabilisation of the exchange rate and the development of capital markets to introduce alternative financial products such as stocks, corporate bonds, treasury bills, government securities and derivatives. These products will provide good alternatives to the holding of foreign currencies and allow them to diversify their investments and minimise the risk of holding assets dominated in the domestic currency in times of unstable economic situations, even though the amount of savings currently held in foreign currencies is insignificant.

Chapter Seven

Empirical Model Specification and Estimation Techniques

7.1   Introduction

This chapter is the first of the two chapters that deal with the econometric analysis in this thesis. There are five sections in this chapter. In the next section, the thesis specifies the econometric models that will be used to test the hypotheses postulated by the thesis. This includes the models to test the effect of interest rate liberalisation, capital account liberalisation and the combined policies have on economic growth. The data that will be used in testing and the method to derive the financial liberalisation indices in the selected countries are presented in the next section. Section four presents the estimation techniques that will be employed in the test. These include the methods for the stationarity or the unit root test as well as the co-integration method that will be used. Now the thesis turns its attention to the model specification.

7.2   Model specification

There have been a number of different models used to test the financial liberalisation hypothesis. Odhiambo (2005a), Khan and Hasan (1998) and Thornton (1990) among others use dynamic models of savings and money demand to test for McKinnon's complementarity hypothesis. Other authors, like Montiel (1995), use an aggregate production function to investigate the relationship between financial liberalisation and economic growth in some Sub-Saharan Africa. Shrestha and Chowdhury (2007) also use a system of two equations to test the interest rate liberalisation in Nepal whilst Naceur, Ghazouani and Omran (2008) use a system of equations to test the effect of stock market liberalisation on economic growth in the MENA countries. In this thesis, the main objective is to test the effect of interest rate liberalisation, capital account

liberalisation and the combined financial liberalisation policies on economic growth. The models to use in each of the tests are now presented below.

7.2.1 Empirical Models Specification: The McKinnon-Shaw hypothesis and the effects of interest rate liberalisation on economic growth

According to McKinnon (1973) and Shaw (1973), interest rate liberalisation spurs economic growth through the efficiency of the financial sector. They are of the view that an increase in savings, an increase in financial deepening and an increase in investment are some of the long-term impacts of the interest rate liberalisation policy. In line with this, the thesis adopts the models used by Shrestha and Chowdhury (2007) to test the effect of interest rate liberalisation on savings, investments and ultimately, economic growth. However, in place of using time deposits held at the banks as a proxy for savings, total bank credits as a proxy of investments and real GDP, the thesis uses real total financial savings[50] (TFS), credit to the private sector (CPS) and real GDP per capita (RGDP) to represent savings and investments and aggregate income respectively. According to the World Bank, credit to private sector refers to financial resources provided to the private sector by the financial sector through vehicles like loans, purchases of non-equity securities, and trade credits as well as other accounts receivable that establishes a claim for repayment and hence a good proxy for investment in the private sector which is the focus of the McKinnon-Shaw hypothesis (World Bank, World indicators, 2009). As the McKinnon and Shaw hypothesis is made up of two unique relationships, i.e. the interest rate effects on savings and the effects on investment via saving, their model is more relevant compared to most of the models found in the literature. In addition, an extra model will be specified to investigate the direct linkage between interest rate liberalisation and economic growth.

Model 1: The effects of interest rate liberalisation on savings

Following Shrestha and Chowdhury (2007), the model to test interest rate effects on savings in the selected countries is specified as:

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[50] This include demand, time, savings and government deposits

$$\text{LnTFS}_{t=} \quad \alpha_0 + \alpha_1 \text{LnRGDP}_t + \alpha_2 \text{RDR}_t + \alpha_3 \text{LnAPDB}_t + u_t \qquad\qquad (7.1)$$

Where TFS_t – total financial savings, RGDP_t, real GDP per capita, RDR_t – real deposit rates, APDB_t – Average population density per bank branch and Ln – natural log operator. α_0 is a constant parameter and u_t is the white noise error term.

In theory, aggregate savings is a function of aggregate income and interest rate on savings. In equation (7.1), total financial savings (TFS) is expressed as a function of real savings rates (RDR), real GDP per capita (RGDP) and the average population density per bank branch (APDB). The real savings rate will be proxied by the real interest rate on deposits (Shrestha and Chowdhurry, 2007) and due to unavailability of data, the average population density per bank branch will be proxied by broad money (M2) divided by the total population (Ghosh, 2005; Chandrasekhar, 2007). This can also be viewed as a relative measure of financial deepening in the economy.

The McKinnon-Shaw hypothesis argues that financial repression stifles savings. Therefore only financial liberalisation will lead to higher savings, higher investment and ultimately to accelerated economic growth in the economy. Interest rates can be viewed as the cost for borrowing money or as the opportunity cost of lending money for a period of time. The real interest rate, the rate adjusted for anticipated inflation, is thus vital for the supply and demand for financial resources. The hypothesis further asserts that higher real interest rate also helps direct the funds to the most productive enterprises and facilitate technological innovation, leading to economic growth. It maintains that by paying a rate of interest on financial assets that is significantly above the marginal efficiency of investment in existing techniques, one can induce some entrepreneurs to disinvest from inferior processes to improved technology and increased scale in other high yielding enterprises. The release of resources from inferior means of production is as important as generating net new savings. Savings provides the resources for investment in physical capital. Hence, it is an important determinant of economic growth. Increased savings are also beneficial in reducing foreign dependence and insulating the economy from external shocks (McKinnon, 1973).

Lewis (1992) also points out that raising interest rates on savings held in the banking sector will have two beneficial effects. He identified these benefits as the savings effect and the investment effect. Furthermore, he argues that raising the real return available to higher earners causes consumption to fall and the supply of financial resources to increase. This increase in financial resources (savings) effect alleviates the chronic shortage of investment resources. An increase in the rate of return to savings relative to returns on other assets will elicit a portfolio response as investors move out of other assets into financial savings in the banking system. On the other hand, real per capita (RGDP), which is computed as real GDP, divided by the total population is usually used to indicate the size of individual income and rate of economic development of a country. In line with this, the thesis uses real GDP per capita as an indicator of economic growth in the analysis. In theory, given the marginal propensity to save, the higher the income, the higher the amount of income saved. It is therefore plausible to use it as an independent variable to investigate the effects of interest rate liberalisation on savings. Naceur et al. (2008) and Shabhaz et al. (2008) used it to investigate the relationship between capital account liberalisation and economic growth, and Odhiambo (2005b and 2010) used it to investigate the relationship between financial development and economic growth in Tanzania and interest rate reforms, financial deepening and economic growth in Kenya respectively.

It is argued that, as the number of bank branches increases, the banks are able to mobilise more deposits and therefore the increased number of bank branches is viewed as having a positive effect on the total deposit mobilisation and hence total savings (Shrestha and Chowdhury 2007). According to Chandrasekhar (2007), there is no reason to expect a linear and positive relationship between proliferation of bank branches and increased financial savings. Branch proliferation and increased financial intermediation have their uses when economies develop and become more complex, but they are not virtues in themselves. In all economies, the value of financial proliferation depends on its ability to increase savings or deposits mobilisation, ease transactions, facilitate investment and direct financial resources to the projects that yield the best social returns and ultimately lead to economic growth. However, despite the elaborate and sometimes expensive branch proliferation in developing countries, there tends to be relatively little savings mobilisation through this process of expansion (Ghosh, 2005). In equation (7.1), α_0

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represent the constant whilst u_t is the error term. Based on the theoretical and the empirical analysis above, the coefficient α_1 and α_2 are expected to be positive. Like Shrestha and Chowdhury (2007), this thesis expects α_3 to be negative.

Model 2: The effects of interest rate liberalisation on investment

The other part of the liberalisation hypothesis postulated by McKinnon (1973) and Shaw (1973) is the positive relationship between real interest rate and investment through savings. In line with Shrestha and Chowdhury (2007), the model to test this part, .i.e. the effects of interest rate liberalisation on investments through savings, is specified as:

$$LnCPS_t = \beta_0 + \beta_1 LnTFS_t + \beta_2 RBLR_t + \beta_3 RRR_t + \beta_4 RBCB_t + e_t \qquad (7.2)$$

Where CPS_t – investment (proxied by the volume of credit to the private sector), TFS_t - savings (proxied by the total financial savings), $RBLR_t$ – real bank lending rate, RRR_t – real refinance rate (proxied by the real discount rates), $RBCB_t$ – real borrowings from central bank and Ln – natural log operator. β_0 is a constant parameter and e_t is the white noise error term.

The McKinnon-Shaw hypothesis argues that financial repression stifles economic growth as a result of controls on financial resources. They argue that only liberalisation of the financial sector will lead to increase in savings, which in turn will lead to increase in investment and hence economic growth. In equation (7.2), investment (CPS) is expressed as a function of savings (TFS), real lending rate (RBLR), real refinance rate (RRR) and real borrowing from the central bank (RBCB). The equation suggests that investment is determined by prior savings and the real returns available on other assets. Theoretically, savings is equal to investments in equilibrium (Montiel, 1995). This is true in McKinnon's world, as per his complementarity hypothesis. However, Shaw's debt intermediation hypothesis assumes no prior savings and to cater for investment outside savings, the real borrowing from the central bank (RBCB) have been include in equation (7.2) to capture investments outside savings.

Credit to the private sector (CPS) is a ratio of total credit extended to the private sector by the banks to the GDP, measures the level of activities and efficiency of the financial intermediation. An increase in the financial resources, especially credits, to the private sector is expected to increase private sector efficiency, investment and production and consequently lead to economic growth. According to the World Bank, credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable, that establish a claim for repayment (World Bank, World indicators, 2009). Many Economists are of the view that credit to the private sector has positive effects on the amount of investments (Asante, 2000; Frimpong and Marbuah, 2010). Credit to the private sector is therefore an appropriate proxy for private sector investments, which is the main determinant of economic growth in the interest rate liberalisation hypothesis. Obamuyi (2009), for example, argue that the main goal of financial liberalisation is to provide a mechanism that facilitates the flow of funds for private sector development and generates investments for rapid economic growth. He showed diagrammatically, the relationship between credit to the private sector and investments. In a previous study, Shrestha and Chowdhury (2007) also used credit to the private sector (total bank credit) as a proxy of investment.

Theoretically, investment decisions are based on marginal benefit versus marginal cost process and it is determined by the expected rate of return on the investment and the interest rate that must be paid to the lender of the financial resources. An investment is therefore made if the expected rate of return is higher than the interest rate. This would suggest that there is an inverse relationship between the interest rate on lending and the expected rate of return on one hand and the quantity or level of investment demanded. In equation (7.2), real lending rate (RBLR) and real refinance rate (RRR), which will be proxied by the discount rate, have been included to represent interest rate on lending and expected rate of return respectively. Haavelmo (1960) and Jorgenson (1963) show that increasing the interest rate reduces investment by raising the cost of capital. However, Chetty (2007), investigating interest rate and investment, shows that this may sometimes not be the case as firms make irreversible investments with uncertain pay-offs. In this environment, he argues, investment becomes a "backward-bending" function of the interest rates. Furthermore, Eregha (2010), investigating interest rates and investment determinants in Nigeria, reveals that variation in interest rates and higher rate on interest rates have a negative and

significant influence on investment decisions and demand for credit have negative influences on interest rate in the short run as well as in the long run. In line with Shrestha and Chowdhury (2007) and the above analysis, the coefficients β_1 and β_4 are expected to be positive but β_2 and β_3 are expected to be negative. Now, let's look at the effects interest rate liberalisation has on economic growth.

Model 3: The effects of interest rate liberalisation on economic growth

The gist of the McKinnon-Shaw hypothesis is that interest rate liberalisation promotes savings and investment and ultimately leads to an increase in economic growth. They argue that real interest rates influence economic growth through their positive effects on savings and investment (see Chapter 2, section 2.3). The McKinnon-Shaw hypothesis can be expressed in the form of Harrod-Domar growth model (Hussain, 1995). Thus:

$$g = z(S^{51}/Y) = z(I/Y) \tag{7.3}$$

where g is the rate of growth of real output, z is the productivity of capital and (S/Y) is the ratio of domestic savings to GDP when in equilibrium is equal to the ratio of domestic investment to GDP (i.e. I/Y). Accordingly, given the productivity of capital, the growth rate should increase, the higher the ratio of savings (investments) to GDP (Hussain, 1995). Conversely, if the ratio of savings to GDP is given, the growth rate can be increased by improving the efficiency of investments, which will then raise the productivity of capital, z (Hussain, 1995). The orthodox approach suggests that interest rate liberalisation will increase both the savings and improve the efficiency of investments (Shaw 1973). Okuda (1990) points out that to do this, it is important to promote investment that will support efficient production in the sectors of the economy with the highest expectation of rapid economic growth (Hussain et al., 2002).

In neo-classical growth models, the long run rate of growth is exogenously determined by either the savings rate (as in the Harrod-Domar model above) or the rate of technical progress (as in the Solow Model). However, the source of the savings rate and the rate of technological progress cannot be

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[51] This is total savings and not financial savings.

explained (Ghatak and Siddiki, 1999). The endogenous growth theory (EGT) tries to solve these problems by constructing macro-economic models out of micro-economic foundations. Thus, households are assumed to maximize their utilities, subject to some budget constraints, while firms maximize profits. In this sense, the most important aspect is usually attributed to innovation (the invention of new technologies) and the human capital. The engine for growth can be as simple as a constant return to scale production function (the AK model) or more complicated set ups with spill-over effects (spill-overs are positive externalities, benefits that are attributed to costs from other firms). Pagano (1993) uses an endogenous growth model which incorporates human capital (L). This is because financial liberalisation leads to increase in the quality of human capital by financing education to less endowed households in the society (Gregorio, 1996).

The endogenous growth theory holds the view that human capital is one of the main sources of economic growth and development. This is a very important argument in the developing countries due to the abundance of labour. The model put forward by Pagano (1993) predicts that financial liberalisation will lead to increase in: (a) saving and investment; (b) the proportion of saving that goes to investment and (c) the efficiency of investment as a result of improvement competition as well as availability of information regarding the investment projects.

Using an AK version of endogenous growth model, Pagano (1993) postulates that the three factors aforementioned in turn increase the rate of economic growth. The extended model predicts that there is an additional efficiency gain caused by the accumulation of human capital as a result of financial liberalisation. To explain the model, assume that aggregate output is a linear function of aggregate capital stock.

$$Y_t = AK_t \qquad\qquad\qquad (7.4)$$

where Y_t is aggregate output, K_t is the aggregate capital stock and t is time. This production function represents a competitive economy with the presence of externality or spill-over effects (Ghatak and Siddiki, 1999). Each firm faces constant returns to scale, but the economy as a whole shows increasing returns to scale with respect to K_t.

Furthermore, suppose that the population is constant and the economy produces a single commodity which can either be consumed or be invested. Also, assume that the rate of amortisation of capital stock is zero and gross investment is:

$$I_t = K_{t+1} - K_t$$
$$..K_{t+1} = I_t + K_t \qquad (7.5)$$

This is a closed economy with only one-sector economy and no government. If we assume that financial intermediaries channel a proportion φ of saving, S_t, to investment, I_t (i.e. a proportion $(1 - \varphi)$ of saving is lost through the process of intermediation and does not go directly to investments. On the basis of this, the capital market equilibrium condition can be expressed as:

$$\psi S_t = I_t \qquad (7.6)$$

Using equations (7.4) and (7.5), the growth rate at time t+1 can be written as:

$$g_{t+1} = (Y_{t+1} - Y_t)/Y_t = (AK_{t+1} - AK_t)/AK_t = K_{t+1}/K_t - 1$$
$$\_g_{t+1} = (I_t + K_t)/K_t - 1 = I_t/K_t = AI_t/AK_t \qquad (7.7)$$

where g_{t+1} is the growth rate of output at time t+1 and the steady state is define as $K_t = K_{t+1} = K$; $Y_t = Y_{t+1} = Y$; $g_t = g_{t+1} = g$. Substituting equation (7.6) into equation (7.7) the steady state growth rate (g) can be written as follows:

$$g = A(I/Y) = A\psi s \qquad (7.8)$$

where s is S/Y. Taking the logarithms of equation (7.8), it can be expressed as:

$$Ln\ g = Ln\ A + Ln\ \psi + Ln\ s \qquad (7.9)$$

Equation (7.9) distinguishes three channels: ψ, s and "A", through which financial liberalisation policies could influence economic growth.

Using endogenous growth theory, the thesis examines a modified version of the growth model used by Beck et al. (2000) and then by Fowowe (2002) where the growth rate of real GDP per capita is regressed on other financial sector indicators and the economic growth model is specified as:

$$LnRGDP_t = \sigma_0 + \sigma_1 LnL_t + \sigma_2 LnK_t + \sigma_3 FDI_t + \sigma_4 LnCPS_t + \sigma_4 FLIR_t + e_t \qquad (7.10)$$

where $RGDP_t$, real GDP per capita, FDI_t – foreign direct investments, CPS_t – investment (credit to the private sector), $FLIR_t$ – interest rate liberalisation index and Ln – natural log operator. σ_0 is a constant parameter and e_t is the white noise error term.

In equation (7.10), economic growth (RGDP) is expressed as a function of real investment (CPS), which in turn is expressed as a function of savings as in equation (7.2) as well as foreign investments (FDI). According to McKinnon-Shaw hypothesis, liberalisation of interest rate leads to an increase in savings, then an increase in investments and ultimately an increase in economic growth. Pagano (1993), as well as Montiel (1995), using a simple aggregate production function framework, shows that interest rate liberalisation can alter the economic growth rate through three main channels. They identified these three channels as: (i) increase in investment resulting from the increase in savings rate; (ii) improvement in the efficiency of capital stock and (iii) improvement in the financial intermediation.

To improve the efficiency of capital requires human effort and this has been captured by including capital stock (K) and a labour factor (L) in equation (7.10). This is because the endogenous growth theory posits that human capital is one of the main sources of economic growth, especially in the developing countries. In a closed economy, savings will equal investments in equilibrium, however, the selected countries are all open economies and hence to capture the effects of external investment, foreign direct investment (FDI) have been included as a control variable. Foreign direct investments are known to have positive effects on economic growth (Sanchez-Robles and Bengoa-Calvo, 2002). To capture the improvement in the financial intermediation, an interest rate liberalisation index (FLIR) has been included in equation (7.10). This is because improvement in intermediation comes through policy changes which the index

will reflect (details methodology of calculating this variable is included in Appendix 1). Based on the above analysis, all the coefficients, σ_1, σ_2, σ_3 and σ_4, are expected to be positive. In the next section, the thesis looks at the effects on capital account liberalisation on economic growth.

7.2.2 Empirical Model Specification: The effects of capital account liberalisation on economic growth

Capital account liberalisation refers to a deliberate policy by which a government of a country allows foreign investors to participate in the domestic shares and bonds market and at the same time allows domestic investors to trade in foreign securities (Henry, 2000). Supporters of capital account liberalisation argue that international capital flows from liberalisation lead to lower cost of capital, allow for risk diversification, encourage investment in projects with higher returns and leads to integration into the world financial system and ultimately to economic growth. On the basis of this, the thesis adopts a modified version of Naceur et al (2008) and Bekaert et al. (2005) and specifies four equations for economic growth. All the equations will include foreign direct investments, trade openness, credit to the private sector and inflation as independent variables along with labour factors and accumulated capital. In addition to the above independent variables, one of the proxies for stock development indicators, .i.e. stock market capitalisation, values of traded stocks and stock turnover, will be included in each of the first three equations to capture the effect of stock development. In the fourth equation, an index to capture all three proxies will instead be included. Finally, an index of capital account liberalisation will be introduced to represent policy changes in the first three equations only. The required equations are specified as:

$$\text{Ln}Y_t = \phi_0 + \phi_1 FDI_t + \phi_2 \text{Ln}TO_t + \phi_3 \text{Ln}MC_t + \phi_4 \text{Ln}CPS_t + \phi_5 FLCA_t + \varepsilon_t \qquad (7.11)$$

$$\text{Ln}Y_t = \delta_0 + \delta_1 FDI_t + \delta_2 \text{Ln}TO_t + \delta_3 \text{Ln}VT_t + \delta_4 \text{Ln}CPS_t + \delta_5 FLCA_t + \varepsilon_t \qquad (7.12)$$

$$\text{Ln}Y_t = \theta_0 + \theta_1 FDI_t + \theta_2 \text{Ln}TO_t + \theta_3 \text{Ln}TR_t + \theta_4 \text{Ln}CPS_t + \theta_5 FLCA_t + \varepsilon_t \qquad (7.13)$$

$$\text{Ln}Y_t = \mu_0 + \mu_1 FDI_t + \mu_2 \text{Ln}TO_t + \mu_3 \text{Ln}SMDIND_t + \mu_4 \text{Ln}CPS_t + \mu_5 \text{Ln}INFL_t + \varepsilon_t \qquad (7.14)$$

Where Y_t, real GDP per capita (RGDP), MC_t – stock market capitalisation, VT_t – stock value traded, TR_t – stock market turnover, TO_t – Trade openness calculated as the sum of exports plus imports, FDI_t – Foreign direct investments, CPS_t - real credit to the private sector, $INFL_t$ – inflation, SMDIND – stock market development index and $FLCA_t$ – capital account liberalisation index which is used to reflect the sum of policy changes over time. $\phi_0, \delta_0, \theta_0$ and μ_0 are constant parameters and ε_t are the white noise error terms. Ln – natural log operator.

According to neo-classical economic thinking, capital account liberalisation will lead to economic growth as a result of inflow of investments from outside the liberalised economy. To test the impact of capital account liberalisation on economic growth therefore, real GDP per capita (Y = RGDP), a measure of economic growth, is modelled as a function of stock market development indicators and other macroeconomic factors. The macroeconomic factors included are as listed above. In the first place, inflation (INFL) has been included as one of the macroeconomic indicators because it can be viewed as an indicator of bad macroeconomic policies, which are likely to make a country prone to crises and hence affect growth negatively. Fischer (2005) shows that inflation is detrimental to economic growth. Furthermore, De Gregorio (1993) points out that higher inflation has the effect of reducing labour supply and hence reduces economic growth. The thesis uses the natural log of one plus rate of inflation to minimise the effect of some outlier rates. On the other hand, trade openness (TO), which is computed as total import plus total export as a ratio of GDP, may affect the efficiency of an economy through several channels, such as specialisation according to comparative advantage, access to larger markets with more product variety and increased competition. These effects may in turn stimulate both capital accumulation and productivity growth (Bonfiglioli, 2005). Furthermore, credit to the private sector (CPS) as the ratio of total credit extended to the private sector by the banks to the GDP, measures the level of activities and efficiency of the financial intermediation. An increase in the financial resources, especially credits, to the private sector is expected to increase private sector efficiency and production, consequently leading to economic growth. On the other control variables, foreign direct investment (FDI) is an effective means of transferring technology to the developing countries. This in turn fosters economic growth. FDI may affect the

level of GDP per capita as well as its growth. Sanchez-Robles and Bengoa-Calvo (2002) for example, show the benefit of FDI to economic growth in developing countries.

Beck et al. (2000) outline three key stock market indicators in measuring size, activity, and efficiency. The ratio of stock market capitalisation to GDP (MC) measures the size of the stock market because it aggregates the value of all listed shares in the stock market. They point out that one can assume that the size of the stock market is positively correlated with the ability to mobilise capital and to diversify risk. However, the size of the stock market does not provide any indication of its liquidity. To measure stock market liquidity, they used the value of stock traded to GDP variable (VT). This indicator, they estimate, is equal to the value of the trades of domestic stocks divided by GDP. Lack of liquidity in the stock market reduces the incentive to invest as it diminishes the efficiency at which resources are allocated and hence affects economic growth and development. In order to capture the efficiency of the domestic stock market, they suggested the use of the Turnover Ratio (TR), which is equal to the value of trades of shares on the stock markets divided by market capitalisation (Naceur et al, 2008). Other writers, including Bencinvenga et al. (1995), are also of the view that more efficient stock markets can foster better resource allocation and spur growth.

To account for the combined effect of capital account liberalisation on economic growth, an index of the three proxies of stock market development (SMDIND) is included. SMDIND is a composite index of the three stock development indicators constructed using their growth rates as in Demirguc-Kant and Levine (1996). To derive the index, the thesis first computes the annual growth rate for market capitalisation (MC), ratio of total stock value traded to GDP (VT), and turnover ratios (TR) for each year. It then takes a simple average of the growth rates to obtain an overall index of stock market development for each year. This index allows us to examine the overall effects of stock market development on economic growth in each of the selected countries.

Finally, the capital account liberalisation index (FLCA) will be determined using principal component analysis (PCA) as explained in the data section below. This is included in the model to capture the various policy changes throughout the implementation of the financial

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liberalisation policy. All the coefficients are expected to be positive apart from the coefficient of inflation, i.e. μ_5. In the next stage of the study, the thesis tests for the impact of both interest rate liberalisation and capital account liberalisation on economic growth in the selected countries.

7.2.3 Empirical Model Specification: The effects of both interest rate and capital account liberalisations on economic growth

Financial liberalisation (both interest rate and capital account liberalisations) is expected to lead to an increase in economic growth. Following the above methodology, the thesis specifies a model which is designed to evaluate the impact of financial liberalisation (both interest rate and capital account) on the macroeconomic developments of the selected ECOWAS countries. On the basis of this, the thesis follows Beck et al. (2000) and specifies a modified model for real GDP per capita, a measure of economic growth, as a function of foreign direct investments, trade openness, stock market development indicators index, financial deepening, government expenditure, volume of investments, real export revenue and inflation as well as variables for labour and capital formation. Thus:

$$\text{Ln}Y_t = C_t + \alpha \text{Ln}K_t + \beta \text{Ln}L_t + \phi FDI_t + \theta \text{Ln}GEXP_t + \eta \text{Ln}RXR_t + \pi \text{Ln}INFL_t + \omega FLBL_t + \varepsilon_t \quad (7.15)$$

where all the variables included are as defined in equations (7.11) to (7.14) above and L_t – labour factor, K_t – accumulated capital, RXR – real export revenue, GEXP – real government expenditure and FLBL – combined financial liberalisation index. C_t is a constant parameter and ε_t is the white noise error term. Ln – Natural log.

Labour (L) and especially trained labour, is expected to enhance productivity by giving incentives for innovation. The measure for labour is proxied by the secondary enrolment rates, which is define as the ratio of the number of enrolment at secondary schools to the total population (Shabhaz et al., 2008). Accumulated capital stock (K) is the stock of capital that has been formed over time. In this study, K is proxied by the real value of the gross fixed capital formation. Several previous studies have used this proxy (Mansouri, 2005).

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Financial liberalisation, both interest rate and capital account, is expected to lead to rapid economic growth and development. Real government expenditure (GEXP) is calculated as a ratio of GDP. This variable was included because it is expected to crowd-out private investments. This has consequences on financial deepening and hence economic growth. Barro and Sala-i-Martin (1995) argue that government expenditure does not directly affect productivity but will lead to distortions in the private sector. One can argue that government expenditure can be growth enhancing too. This is mostly the case in the developing countries, like the three selected ECOWAS countries where the bulk of investments come in the form of government expenditure. Nurudeen and Usman (2010) for example, show that government expenditures in the transport, communication and health sectors have a positive impact on economic growth in Nigeria.

Many economists share the view that the benefits that will be derived from an increase in real exports revenue (RXR) include greater capacity utilisation, economies of scale, incentives to technological improvements, development of indigenous entrepreneurship and efficient management due to competition from abroad (Balassa, 1978; Bhagwati and Srinivasam, 1979; and Krueger, 1980). It follows then, that countries which have adopted policies less biased against export benefited from closer-to-optimal resource allocation and economic growth (Feder, 1983).

Finally, the combined financial liberalisation index (FLBL) will be determined using principal component analysis (PCA) as explained in the data section below. This is included in the model to capture the various policy changes throughout the implementation of the financial liberalisation policy. A similar index was used by Caprio et al. (2001) and Laeven (2003) in their investigation of the effects of financial liberalisation (see below). The sign of the constant elasticity coefficient α, β, ϕ, η and ω are all expected to be positive, however, π and θ are expected to be negative. Now the thesis looks to data and the construction of the financial liberalisation indices.

7.3 Data and Construction of financial indices

7.3.1 Type and sources of data

The data to be used in the study covers annual time series data from 1969 to 2008 for all the selected countries. The sources of the data include various issues of World Bank's, World Development Indicators, African Development Indicators and IMF's International Financial Statistics, Bank of Ghana, Ghana Statistical Services, Central Bank of Nigeria, Nigerian Office of Federal Statistics, West African Economic and Monetary Union (WAEMU) and other relevant sources. The variables and the reason for their inclusion in the models are provided below. In assessing the effects of financial liberalisation on economic growth, the thesis has used the variables described in the following section.

7.3.2 Construction of financial liberalisation indices

As indicated above, three financial liberalisation indices (FLIR, FLCA and FLBL) will be constructed to capture policy changes during the implementation period. The method to derive these indices is described below.

The implementation process of financial liberalisation involves a number of policies. However, most of the studies that involve financial liberalisation implementation policies use individual financial liberalisation policies, or a dummy to represent the effect of the policy. In doing so, such studies either treated partial financial liberalisation as the full liberalisation policy or excluded it by taking only the date of the full liberalisation. To avoid the problem of losing information on the full liberalisation and allowing possible reversal of the policy, this thesis follows Shrestha and Chowdhury (2006), Caprio *et al*. (2000), and Laeven (2003) and constructs three financial liberalisation indices (FLIR, FLCA and FLBL) for the selected ECOWAS countries using principal component analysis (PCA). The first index will be constructed for the implementation of the interest rate liberalisation policies taken (FLIR); the second one will be constructed for the implementation of the capital account liberalisation, and the last, a combined index for the effect of both interest rate liberalisation and capital account liberalisation on

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economic growth (see Appendix I). For example, Caprio *et al*. (2000) construct a financial liberalisation index for eight developing countries by including eight main components of financial liberalisation in their index, which are (i) interest rates, (ii) pro-competition measures, (iii) reserve requirements, (iv) credit controls, (v) banks' ownership, (vi) prudential regulation, (vii) stock markets, and (viii) international financial liberalisation. Laeven (2003) also constructs a similar index for 13 developing countries. He includes six measures of financial liberalisation but excludes the measures related to stock markets and external sector in his index, whilst Shrestha and Chowdhury (2006) constructed a similar index for Nepal which included both internal and external liberalisation. Demetriades and Luintel (1997) had previously constructed a financial repression index for India using the principal components analysis. They included nine different repression policies. Furthermore, Laurenceson and Chai (2003) also constructed a similar financial repression index for China.

According to Shrestha and Chowdhury (2006), in order to derive the financial liberalisation indices, some arbitrary value is assigned to each of the financial liberalisation policy variables. Each policy variable can take a value between 0 and 1 depending on the implementation status. When a particular sector is fully liberalised, that policy variable takes a value of 1, and when that sector remains regulated, it takes a value of 0. To capture the scenario of part, step-wise or gradual liberalisation process in a particular sector, partial values like 0.33, 0.50, and 0.66 would be assigned. A value of 0.50 would indicate the first phase of partial deregulation in a two-step deregulation process, whereas a value 0.33 and 0.66 would indicate the first and second steps, respectively, in a three-phased deregulation process. The two-phased process takes a value of 1 in the second phase and the three-phased case takes a value of 1 in the third phase. In other words, if a sector is fully liberalised in a single phase, the value assigned in this case is 1. But if the liberalisation is completed in two phases, then 0.5 is assigned for the first phase and 1 for the second. Similarly, if the liberalisation takes place in three phases, then the number assigned is 0.33 for the first phase, 0.66 for the second phase and 1 for the last phase (Shrestha and Chowdhury, 2006)

The descriptions of the policy variables that will be used in the construction of the indices for the selected countries are presented below (see Appendix I for technical details).

ERP	-	Exchange rate polices
RLRP	-	Regulatory and Legal Reforms
INTRP	-	Institutional Restructuring
CAL	-	Capital Account liberalisation
DMD	-	Demonetisation of the domestic currency
MCP	-	Monetary control policies
IRP	-	Interest Rate policies
CMD	-	Capital Market development
SRRP	-	Secondary Reserve requirement policies
CUB	-	Creation of Universal banking

As financial liberalisation is expected to lead to economic growth, positive coefficients are expected for these variables. The results of financial liberalisation index constructed using principal component analysis (PCA) are presented in appendix I. Now the thesis turns its attention to the estimation methods. The models for testing the stated hypothesis are now presented below.

7.4 Estimation Techniques

In econometrics, there are a myriad of estimation techniques that can be used to investigate or evaluate co-integration relationships among macroeconomic variables. For example, for univariate co-integration analysis, one can use the Engle-Granger (1987) mechanism as well as the Phillips and Hansen (1990) procedure. In the case of multivariate co-integration analysis, one can use Johansen (1988); Johansen and Juselius (1990) approaches. Johansen (1995) has further compiled full information for the maximum likelihood co-integration approach. Furthermore, one can use the newly proposed autoregressive distributed lag (ARDL) approach popularised by Pesaran and Shin (1995 and 1998), Pesaran *et al.* (1996), and Pesaran *et al.* (2001). Recently, studies have showed that the ARDL approach to co-integration has been preferred to other conventional co-integration approaches such as Engle and Granger (1987) and Gregory and Hansen (1996). To follow this trend, this thesis applies the ARDL – Bounds testing methodology

to estimate the specified models and empirically analyse the long run relationship and the dynamic interaction between the relevant variables. Firstly, a test of stationarity will be completed, and then the ARDL – Bounds testing approach to co-integration analysis follows.

7.4.1   Unit Root Tests

Before conducting the co-integration analysis on the specified models, it is important to check each time series variable for stationarity or unit root. If the time series variable is found to be non-stationary, the regression analysis that will be performed in the traditional way will produce spurious results. In this vain, the unit root or the stationarity test is conducted first. In this thesis, the Augmented Dickey-Fuller (ADF) and a more efficient method of Dickey-Fuller generalised least square (DF-GLS) test for autoregressive unit root as recommended by Elliot et al. (1996) and Phillips and Peron (1988) unit root tests are applied. The thesis reports on only the results of the Dickey-Fuller generalised least square (DF-GLS) and the Phillips and Peron unit roots test.

The ADF is a unit root test for time series where the equation below tests the unit root:

$$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta y_{t-1} + \varepsilon_t \qquad (7.16)$$

where y_t is the variable in question, ε_t is white noise error term and
$\Delta y_{t-1} = (y_{t-1} - y_{t-2})$, $\Delta y_{t-2} = (y_{t-2} - y_{t-3})$
These tests are used to determine whether the estimated δ is equal to zero or not. Fuller (1976) has complied cumulative distribution of the ADF statistics by showing that if the value of the calculated ratio of the coefficient is less than critical value from ADF statistics, then y is said to be stationary[52]. However, according to Dejong et al. (1992), as well as Harris (1992), this test is not reliable for small sample data sets due to its size and power properties. They show that for small sample data sets, as in the case of this thesis, these tests seem to over reject the null hypotheses when it is true, and accept it when it is false. This requires a robust testing method such as the DF-GLS.

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[52] Note that the 't' ratio of the coefficient δ is always with negative sign.

The DF-GLS is a modified version of the conventional augmented Dickey-Fuller (ADF) t-test as it applies generalised least squares (GLS), which de-trend the variable before running the ADF test regression. Compared with the ADF tests, the DF-GLS test has the best overall performance in terms of sample size and power and has been used in most of the recent studies. According to Elliot et al. (1996), it has substantially improved power when an unknown mean or trend is present. The test regression included both a constant and a trend for the log levels and a constant with no trend for the first differences of the variables.

In the first place, the DF-GLS applies a generalised least squares de-trending to the variables as follows:

$$y_t^d = y_t - \beta`z_t \tag{7.17}$$

For de-trending, $z_t = (1,t)`$ and β_0, β_1 are calculated by regressing
$$[y_1, (1-\alpha L) y_2,\ldots, (1-\alpha L) y_T] \tag{7.18}$$
onto
$$[z_1, (1-\alpha L) z_2,\ldots, (1-\alpha L) z_T] \tag{7.19}$$

where $\alpha = 1+ c/T$ with $c = -13.5$ and L is the lag operator. For de-trending, $z_t = (1)`$ and the same regression is run with $c = -7.0$. The values of c are chosen so that the test achieves the power envelope against stationary alternatives at 50% power (Stock, 1994). The ADF regression in (7.20) is then estimated using the y_t^d series to test the null hypothesis that $\rho = 0$.

$$\Delta y_t^d = \alpha + \gamma t + \rho y_{t-1}^d + \sum_{i=1}^{m} \delta_i \Delta y_{t-i}^d + \varepsilon_t \tag{7.20}$$

where m is the maximum lag.

Once the order of integration has been established as either I(0) or I(1), the ARDL methodology starts, otherwise further investigation is required. The ARDL procedure will otherwise crush if there are I(2) series presence in the model.

Phillips and Peron (1988) proposed a non-parametric method of controlling serial correlation when unit roots are tested for time series data. In the first place the method estimates the non-augmented Dickey –Fuller as:

$$\Delta X_t = \beta_1 + \delta X_{t-1} + \varepsilon_t \hspace{5cm} (7.21)$$

The objective of the test is to detect the presence of a unit root in the time series X_t by estimating equation (7.15). The test also estimates the modified t-value associated with the estimated coefficient of δ so that the serial correlation does not affect the asymptotic distribution of the t-statistics. The series is stationary if the estimated δ is negative and significant.

7.4.2   ARDL – Bounds testing Approach to co-integration test

Engle-Granger (1987) co-integration analysis, the maximum likelihood based Johansen (1991 and 1995) and Johansen-Juselius (1990) are the most used co-integration methodologies. However, due to the low power and other problems, the ordinary least squares (OLS) based autoregressive distributed lag (ARDL) – Bounds testing methodology has been the favoured approach to co-integration analysis in recent times (Shrestha and Chowdhury, 2007; Charemza and Deadman, 1992). One of the reasons for employing the ARDL methodology is that it is applicable irrespective of whether the underlying regressors are purely I(0), purely I(1) or mutually co-integrated (Odhiambo, 2009a; Oteng-Adayie and Frimpong, 2006). The statistic underlying this procedure is the familiar Wald or F-statistic in a generalised Dickey-Fuller type regression, which is used to test the significance of lagged levels of the variables under consideration in a conditional unrestricted equilibrium error correction model (UECM) (Pesaran, *et al.*, 2001). Another reason for using the ARDL approach is that it is more robust and performs better for small or finite sample sizes, as in the case of this study, than other co-integration techniques. Furthermore, according to Banerjee et al. (1993), a dynamic error correction model (ECM) can be established from ARDL through a simple linear transformation. The ECM integrates the short run dynamics with the long run equilibrium without losing long run information. Laurenceson and Chai (2003) also argue that using the ARDL – Bounds testing

approach avoids problems resulting from non-stationary time series data (Shrestha and Chowdbury, 2007).

As a result of the above discussion, this thesis applies the ARDL – Bounds testing approach to examine the dynamic relationship between financial liberalisation, both interest rate and capital account, on economic growth in the selected countries. Narayan and Narayan (2005) showed that the bounds testing methodology based on the unrestricted error correction model (UECM) has numerous advantages over the traditional co-integration methods.

From Pesaran et al. (2001), one can summarise the bounds test procedure of the long run relationship of the specified equations as general vector autoregressive models of order p, in Z_t:

$$Z_t = c_o + \mu t + i = \sum_{i=1}^{p} \mho_i \Delta Z_{t-i+} \varepsilon_t, \text{ where } t = 1, 2, 3, \ldots, T \tag{7.22}$$

with c_o representing a $(k+1)$ – vector of intercepts (drift) and μ denoting a $(k+1)$ – vector of trend coefficients. One can further derive the following vector equilibrium correction model (VECM) corresponding to equation (7.22):

$$\Delta Z_t = c_o + \mu t + \Pi Z_{t-1} + \Gamma_i \Delta_{t-I} + \varepsilon_t, \text{ where } t = 1, 2, 3, \ldots, T \tag{7.23}$$

and a matrices of $(k+1) \times (k+1)$ and $\Pi = I_{k+1} + \Psi_i$ and

$\Gamma_i = -\Psi_j$, $i = 1, 2, 3, \ldots, p\text{-}1$ contain the long-run multiplier and the short-run dynamic coefficient of VECM. Z_t is the vector of variables Y_t and X_t respectively. Y_t is an I(1) dependent variable as define in the respective models and X_t is a vector matrix of independent variables with I(0) and I(1) with a multivariate identically and independently distributed (i.i.d) zero mean vector $\varepsilon_t = (\varepsilon_{1t}, \varepsilon_{2t})$ and a homoscedastic process. If one further assumes that there exists a unique long run relationship between the variables, then the conditional VECM in equation (7.23) becomes:

$$\Delta Y_t = c_{Y0} + \mu t + \delta_{YY} Y_{t-1} + \delta_{XX} X_{t-I} + \sum_{i=1}^{p-1} \lambda_i \Delta Y_{t-1}$$

$$+ \sum_{i=0}^{p-1} \xi_i \Delta X_{t-1} + \varepsilon_{Yt}, t = 1, 2, \ldots, T \tag{7.24}$$

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The ARDL - bounds testing approach based on unrestricted error correction model (UECM) technique involves two stages. The first stage is to estimate the ARDL model of interest by ordinary least squares (OLS) in order to test for the existence of a long run relationship among the relevant variables. This is done by constructing an unrestricted error correction model (UECM) and then testing whether the lagged levels of the variables in each of the equations are statistically significant or not. In other words, whether the null hypothesis of no long-term relationship is rejected or accepted. To achieve this, a Wald test (F-statistics version for bound testing methodology) for the joint significance of the lagged levels of the variables, i.e. testing the null hypothesis against the alternative hypothesis is performed. If the F-statistics is above the upper critical value, the null hypothesis of no long run relationship can be rejected, irrespective of the orders of integration for the time series. Conversely, if the test statistics fall below the lower critical values then the null hypothesis cannot be rejected. However, if the F-statistics falls between the upper and lower critical values, then the result is inconclusive. In this case the asymptotic distribution of the Wald test (F- statistics) is non-standard under the null hypothesis of no co-integration between the variables of interest, irrespective of whether the explanatory variables are purely I(0) or I(1).

Once the long run relationship or co-integration has been established, the second stage of testing involves the estimation of the long run coefficients (which represent the optimum order of the variables after selection by AIC or SBC) and then deriving the associated error correction model in order to calculate the adjustment coefficients of the error correction term (Masih et al., 2008). Therefore, the short run effects are captured by the coefficients of the first differenced variables in the UECM model. According to Bahmani-Oskooee and Brooks (1999) the existence of a long-term relationship derived from equation (7.23) does not necessarily imply that the estimated coefficients are stable. This suggests that there is the need to perform a series of test diagnostics on the model established. This involves testing of the residuals (i.e. homoscedasticity, non-serial correlation, etc.), as well as stability tests (i.e. Ramsey RESET and CUSUM tests) to ensure that the estimated model is statistically robust.

Models for testing the effects of interest rate liberalisation on Economic growth

Following Shrestha and Chowdhury (2007) and based on equation (7.24), the unrestricted error correction model (UECM) of equation (7.1) to estimate is:

$$\Delta \text{Ln} TFS_t = c_0 + \delta_1 \text{Ln} TFS_{t-1} + \delta_2 \text{Ln} RGDP_{t-1} + \delta_3 RDR_{t-1} + \delta_4 \text{Ln} APDB_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \text{Ln} TFS_{t-I}$$

$$\sum_{i=0}^{q} \beta_j \Delta \text{Ln} RGDP_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta RDR_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta \text{Ln} APDB_{t-k} + \varepsilon_t \qquad (7.25)$$

the UECM of equation (7.2) is:

$$\Delta \text{Ln} CPS_t = c_1 + \lambda_1 \text{Ln} CPS_{t-1} + \lambda_2 \text{Ln} TFS_{t-1} + \lambda_3 RBLR_{t-1} + \lambda_4 RRR_{t-1} + \lambda_5 RBCB_{t-1} +$$

$$\sum_{i=1}^{p} \alpha_i \Delta \text{Ln} CPS_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln} TFS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta RBLR_t + \sum_{i=0}^{q} \zeta_k \Delta RRR_{t-k} + \sum_{i=0}^{q}$$

$$\phi_m \Delta RBCB_{t-m} + \upsilon_t \qquad (7.26)$$

and UECM of equation (7.4) is:

$$\Delta \text{Ln} RGDP_t = c_2 + \sigma_1 \text{Ln} RGDP_{t-1} + \sigma_2 \text{Ln} K_{t-1} + \sigma_3 \text{Ln} L_{t-1} + \sigma_4 FDI_{t-1} + \sigma_5 \text{Ln} CPS_{t-1} + \sigma_6 FLIR_{t+}$$

$$\sum_{i=1}^{p} \alpha_i \Delta \text{Ln} RGDP_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln} K_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{Ln} L_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} +$$

$$\sum_{i=0}^{q} \varphi_m \Delta \text{Ln} CPS_{tm} + \sum_{i=0}^{q} \phi_z \Delta FLIR_t + \varpi_t \qquad (7.27)$$

In the equations above, the terms with the summation signs represent the error correction (ECM) dynamics (Poon, 2010) and the coefficients δ_i, λ_i and σ_i are the long run multiplier corresponding to the long run relationship. The coefficients c_0, c_1 and c_2 are the drifts, ε_t, υ_t and ϖ_t are the white noise errors, Δ is the first difference operator and p and q are the lag length for the UECM. FLIR is an index to represent interest rate liberalisation and Ln is the natural log operator. To test the existence of long run relationship for the above model, the thesis conducts an F-test for a joint significance of the coefficient of the lagged levels by using ordinary least

square (OLS). Thus, test the null hypotheses, $H_N : \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$, $H_N : \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ and $H_N : \sigma_1 = \sigma_2 = \sigma_3 = \sigma_4 = \sigma_5 = \sigma_6 = 0$ which indicate no long run relationship against the alternative hypotheses, $H_A : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$, $H_A : \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0$ and $H_A : \sigma_1 \neq \sigma_2 \neq \sigma_3 \neq \sigma_4 \neq \sigma_5 \neq \sigma_6 \neq 0$. The functions which normalise the tests are denoted by F_{LnTFS} (LnTFS| LnRGDP, RDR, LnAPDB), F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR, RBCB) and F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR).

Models for testing the effects of capital account liberalisation on Economic growth

Based on equation (7.24), the unrestricted error correction models (UECM) of equations (7.11), (7.12) and (7.13) to estimate are as follows:

$$\Delta LnY_t = c_0 + \sigma_1 LnY_{t-1} + \sigma_2 FDI_{t-1} + \sigma_3 LnTO_{t-1} + \sigma_4 LnMC_{t-1} + \sigma_5 LnCPS_{t-1} + \sigma_6 FLCA_{t-1} + \sum_{i=1}^{p}$$

$$\alpha_i \Delta LnY_{t-i} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} + \sum_{i=0}^{q} \varphi_m \Delta LnTO_{t-m} + \sum_{i=0}^{q} \eta_n \Delta LnMC_{t-n} + \sum_{i=0}^{q} \lambda_r \Delta LnCPS_{t-r} + \sum_{i=0}^{q}$$

$$\phi_z \Delta FLCA_{t-z} + \varepsilon_t$$

(7.28)

$$\Delta LnY_t = c_1 + \delta_1 LnY_{t-1} + \delta_2 FDI_{t-1} + \delta_3 LnTO_{t-1} + \delta_4 LnVT_{t-1} + \delta_5 LnCPS_{t-1} + \delta_6 FLCA_{t-1} + \sum_{i=0}^{q}$$

$$\alpha_i \Delta LnY_{t-i} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} + \sum_{i=0}^{q} \phi_m \Delta LnTO_{t-m} + \sum_{i=0}^{q} \eta_n \Delta LnVT_{t-n} + \sum_{i=0}^{q} \lambda_r \Delta LnCPS_{t-r} + \sum_{i=0}^{q}$$

$$\phi_z \Delta FLCA_{t-z} + \upsilon_t$$

(7.29)

$$\Delta LnY_t = c_2 + \varphi_1 LnY_{t-1} + \varphi_2 FDI_{t-1} + \varphi_3 LnTO_{t-1} + \varphi_4 LnTR_{t-1} + \varphi_5 LnCPS_{t-1} + \varphi_6 FLCA_{t-1} + \sum_{i=1}^{p}$$

$$\alpha_i \Delta LnY_{t-i} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} + \sum_{i=0}^{q} \phi_m \Delta LnTO_{t-m} + \sum_{i=0}^{q} \eta_n \Delta LnTR_{t-n} + \sum_{i=0}^{q} \lambda_r \Delta LnCPS_{t-r} + \sum_{i=0}^{q}$$

$$\phi_z \Delta FLCA_{t-z} + \mu_t$$

(7.30)

$$\Delta \text{Ln}Y_t = c_3 + \mu_1 \text{Ln}Y_{t-1} + \mu_2 FDI_{t-1} + \mu_3 \text{Ln}TO_{t-1} + \mu_4 \text{Ln}SMDIND_{t-1} + \mu_5 \text{Ln}CPS_{t-1} + \mu_6 \text{Ln}INFL_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \text{Ln}Y_{t-i} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} + \sum_{i=0}^{q} \phi_m \Delta \text{Ln}TO_{t-m} + \sum_{i=0}^{q}$$

$$\eta_n \Delta \text{Ln}SMDIND_{t-n} + \sum_{i=0}^{q} \lambda_r \Delta \text{Ln}CPS_{t-r} + \sum_{i=0}^{q} \theta_p \Delta \text{Ln}INFL_{t-p} + \chi_t$$

$$(7.31)$$

In the equations above, the terms with the summation signs represent the error correction (ECM) dynamics (Poon, 2010) and the coefficients σ_i, δ_i, ϕ_i and μ_i are the long run multipliers corresponding to long run relationships. The coefficients c_0, c_1, c_2 and c_3 are the drifts and ε_t, υ_t, μ_t and χ_t are the white noise errors and Ln, the natural log operator. To test the existence of long run relationship for each of the above equations, the thesis conducts an F-test for a joint significance of the coefficient of the lagged levels by using ordinary least square (OLS). Thus, test the null hypotheses, $H_N : \sigma_1 = \sigma_2 = \sigma_3 = \sigma_4 = \sigma_5 = \sigma_6 = 0$; $H_N : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = 0$; $H_N : \varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = \varphi_6 = 0$ and $H_N : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = 0$ which indicates no long run relationships against the alternative hypotheses, $H_A : \sigma_1 \neq \sigma_2 \neq \sigma_3 \neq \sigma_4 \neq \sigma_5 \neq \sigma_6 \neq 0$; $H_A : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq 0$; $H_A : \varphi_1 \neq \varphi_2 \neq \varphi_3 \neq \varphi_4 \neq \varphi_5 \neq \varphi_6 \neq 0$ and $H_A : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq 0$. The functions which normalise the tests are denoted by F_{LnY} (LnY| FDI, LnTO, LnMC, LnCPS, FLCA), F_{LnY} (LnY| FDI, LnTO, LnVT, LnCPS, FLCA), F_{LnY} (LnY| FDI, LnTO, LnTR, LnCPS, FLCA) and F_{LnY} (LnY| FDI, LnTO, LnSMDIND, LnCPS, LnINFL).

Model for testing the effects of interest rate liberalisation and capital account liberalisation on Economic growth

Based on equation (7.24), the unrestricted error correction model (UECM) of equation (7.15) to estimate is as follows:

$$\Delta \mathrm{Ln}Y_t = c_0 + \delta_1 \mathrm{Ln}Y_{t-1} + \delta_2 \mathrm{Ln}K_{t-1} + \delta_3 \mathrm{Ln}L_{t-1} + \delta_4 FDI_{t-1} + \delta_5 \mathrm{Ln}GEXP_{t-1} + \delta_6 \mathrm{Ln}RXR_{t-1} + \delta_7 \mathrm{Ln}INFL_{t-1}$$

$$+ \delta_8 FLBL_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \mathrm{Ln}Y_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \mathrm{Ln}K_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \mathrm{Ln}L_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta FDI_{t-k} + \sum_{i=0}^{q}$$

$$\lambda_r \Delta \mathrm{Ln}GEXP_{t-r} + \sum_{i=0}^{q} \varphi_v \Delta \mathrm{Ln}RXR_{t-v} + \sum_{i=0}^{q} \theta_p \Delta \mathrm{Ln}INFL_{t-p} + \sum_{i=0}^{q} \phi_z \Delta FLBL_{t-z} + \varepsilon_t \quad (7.32)$$

In the equations above, the terms with the summation signs represent the error correction (ECM) dynamics (Poon, 2010) and the coefficients δ_i are the long run multipliers corresponding to long run relationship and the coefficient c_0 is the drift and ε_t are the white noise errors and Ln, is the natural log operator. To test the existence of long run relationship for the above model, the thesis conducts an F-test for a joint significance of the coefficient of the lagged levels by using ordinary least square (OLS). Thus, test the null hypothesis, $H_N : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = 0$ which indicates no long run relationship against the alternative hypothesis, $H_A : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq 0$. The function which normalises the test is denoted by F_{LnY} (LnY| LnL, LnK, FDI, LnGEXP, LnRXR, LnINFL, FLBL).

The general UECM model is tested downwards sequentially by dropping the statistically non-significant first differenced variables for each of the equations to arrive at a "goodness of fit" equation using general-to-specific strategy. Once the co-integration relationships are established, the ARDL model is selected using Akaike information criteria (AIC) or Schwarz Bayesian Ctriteria (SBC). The long run elasticities or coefficients can then be generated from UECM by using the estimated coefficients of the one lagged independent variables, multiplied by a negative sign, and divided by the estimated coefficient of the one lagged dependent variable (Bardsen, 1989). The short run coefficients are then derived from the estimated coefficient of the first differenced variable in UECM models (Poon, 2010).

Finally, to ascertain the goodness of fit or the appropriateness of the ARDL models, the diagnostic and stability tests are conducted in line with Pesaran et al. (2001). These diagnostic tests examine the existence of serial correlation, whether there are any functional forms, normality and heteroscedasticity tests associated with the models. The stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of

squares of recursive residuals (CUSUMSQ). Furthermore, examining the prediction error of the model is another way of ascertaining the reliability of the ARDL models. If the error or the difference between the real observation and the forecast is insignificant, then the model can be regarded as best fitting.

In the next chapter, the thesis analyses the results from the selected ECOWAS countries after applying the specified models and the estimation techniques discussed above.

Chapter Eight

Econometric Analysis and Empirical Findings

8.1   Introduction

In this chapter, the thesis presents the econometric analysis and the empirical findings from the three selected countries using the models and the methodology as discussed in the previous chapter. Thus, the thesis employs the ARDL – Bounds testing approach and unrestricted error correction model (UECM) to co-integration analysis developed by Peseran and Shin (1999) to establish long and short run relationships for the specified models. The chapter is sub-divided into four sections, including this introduction. Each section will cover one of the selected countries and will include unit root or stationarity tests and analysis, test bounds results, long run empirical results and analysis, short run empirical results and analysis and error correction analysis, as well as models diagnostics.

As explained in section 7.4.2, the bounds test approach involves two stages. In the first stage, an arbitrary number of lags are imposed on the first differenced variables then the F-test for joint significance is carried out to test for co-integration among the relevant variables. However, according to Bahmani-Oskooee and Brooks (1999), as well as Bahmani-Oskooee and Goswani (2004), the results of the F-test on this basis could be sensitive to the choice of the lag length (Bahmani-Oskooee and Karacal, 2006). As a result, following Bahmani-Oskooee and Karacal (2006), this thesis first estimates the ARDL model then uses either Akaike Information Criterion (AIC) or the Schwarz Bayesian Criterion (SBC) to select the optimum number of lags before carrying out the F-test of joint significance at the optimum lags. The thesis now turns its attention to the empirical analysis for the selected countries.

8.2   Empirical findings and analysis for Ghana

In this section, the thesis presents the empirical results and analysis based on the specified models, methodology and time series data from Ghana. As discussed in section 7.4.1, before the thesis goes ahead with the ARDL bounds testing, it will first test for the stationarity of all the variables that are going to be used in the analysis to ensure that they are all in the order of I(0) or I(1) stationary so as to avoid spurious results. Ouattara (2004) points out that, in the presence of I(2) variables, the computed F-statistics provided by Peseran et al. (2001) are not valid as the bound tests are based on the assumption that the variables are stationary in the order of I(0) or I(1).

8.2.1   Unit root tests for variables from Ghana

As indicated in section 7.4.1, the results of the Dickey-Fuller generalised least squares (DF-GLS) and the Phillips and Peron (PP) unit root tests for Ghana are reported in Tables G1 to G4 below. The DF-GLS lag length is selected automatically by AIC whilst the PP truncation lag is selected automatically on the Newey-West bandwidth.

Table G1: DF-GLS unit root tests for the Ghanaian variables in levels.

Variable	No Trend	Result	Trend	Result
LnAPDB	-2.015*	S	-2.262	N
LnCPS	-0.878	N	-1.597	N
FDI	-1.109	N	-2.016	N
FLBL	0.920	N	-1.781	N
FLCA	0.592	N	-1.762	N
FLIR	0.491	N	-1.885	N
LnGDIGDP	-1.027	N	-2.088	N
LnGDSGDP	-3.888	S	-4.452	S
LnGEXP	-1.784**	S	-2.818	N
LnINFL	-2.119*	S	-2.478	N

Variable	No Trend	Result	Trend	Result
LnK	-0.333	N	-2.079	N
LnL	0.738	N	-2.352	N
LnM2GDP	-1.442	N	-1.841	N
LnMC	-2.111**	S	-2.424	N
LnRGDP	-1.293	N	-1.152	N
RBCB	-4.250***	S	-4.903***	S
RBLR	-1.617	N	-2.683	N
RDR	-2.021**	S	-2.617	N
RRR	-1.903**	S	-2.394	N
LnRXR	-1.522	N	-1.651	N
LnSMDIND	-3.513***	S	-3.899***	S
LnTFS	-0.735	N	-2.942*	S
LnTO	-1.361	N	-1.551	N
LnTR	-2.022**	S	-2.989*	S
LnVT	-2.617**	S	-3.315**	S

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. L is the log operator. The log of one plus the rates of inflation were used to diminish the impact of some outlier observations.

Table G2: DF-GLS unit root tests for the Ghanaian variables in first difference.

Variable	No Trend	Result	Trend	Result
$\Delta LnAPDB$	-4.420***	S	-4.425***	S
$\Delta LnCPS$	-3.048***	S	-6.308***	S
$\Delta FDIG$	-6.637***	S	-7.294***	S
$\Delta FLBLG$	-5.526***	S	-5.814***	S
$\Delta FLCAG$	-6.196***	S	-6.596***	S
$\Delta FLIRG$	-5.933***	S	-6.111***	S
$\Delta LnGDIGDP$	-6.503***	S	-6.708***	S
$\Delta LnGEXP$	-4.419***	S	-5.093***	S
$\Delta LnINFL$	-5.925***	S	-10.345***	S
ΔLnK	-7.291***	S	-7.927***	S

Variable	No Trend	Result	Trend	Result
ΔLnL	-6.834***	S	-6.865***	S
$\Delta LnM2GDP$	-2.245**	S	-2.532	N
$\Delta LnMC$	-4.159***	S	-4.529***	S
$\Delta LnRGDP$	-4.400***	S	-4.480***	S
$\Delta RBLR$	-5.999***	S	-9.734***	S
ΔRDR	-9.409***	S	-9.465***	S
ΔRRR	-8.996***	S	-9.077***	S
$\Delta LnRXR$	-7.001***	S	-7.429***	S
$\Delta LnTFS$	-5.856***	S	-5.908***	S
ΔLTO	-4.382***	S	-4.754***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and L is the log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively.

Table G3: PP unit root tests for the Ghanaian variables in levels.

Variable	No Trend	Result	Trend	Result
LnAPDB	-1.958	N	-1.928	N
LnCPS	-0.515	N	-1.183	N
FDI	-0.889	N	-1.952	N
FLBL	0.153	N	-2.221	N
FLCA	0.343	N	-1.945	N
FLIR	-0.306	N	-2.085	N
LnGDIGDP	-0.940	N	-2.296	N
LnGDSGDP	-4.328***	S	-4.429***	S
LnGEXP	-2.379	N	-2.313	N
LnINFL	-3.785***	S	-3.947**	S
LnK	-0.559	N	-1.798	N
LnL	-0.797	N	-2.306	N
LnM2GDP	-0.944	N	-1.338	N
LnMC	-4.366***	S	-2.543	N
LnRGDP	-0.567	N	-0.395	N
RBCB	-4.351***	S	-4.829***	S

Variable	No Trend	Result	Trend	Result
RBLR	-2.421	N	-4.054***	S
RDR	-3.023**	S	-3.817**	S
RRR	-2.637*	S	-3.455*	S
LnRXR	-1.844	N	-1.631	N
LnSMDIND	-4.347***	S	-5.445***	S
LnTFS	-1.781	N	-2.526	N
LnTO	-1.996	N	-1.689	N
LnTR	-1.839	N	-2.235	N
LnVT	-2.997*	S	-3.830**	S

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. L is the log operator. The log of one plus the rates of inflation were used to diminish the impact of some outlier observations.

Table G4: PP unit root tests for the Ghanaian variables in first difference.

Variable	No Trend	Result	Trend	Result
$\Delta LnAPDB$	-3.633***	S	-3.591**	S
$\Delta LnCPS$	-4.923***	S	-5.034***	S
ΔFDI	-6.599***	S	-7.593***	S
$\Delta FLBL$	-5.688***	S	-5.671***	S
$\Delta FLCA$	-6.229***	S	-6.440***	S
$\Delta FLIR$	-6.057***	S	-5.969***	S
$\Delta LnGDIGDP$	-6.767***	S	-6.940***	S
$\Delta LnGEXP$	-4.235***	S	-4.229***	S
ΔLnK	-8.102***	S	-8.305***	S
ΔLnL	-6.744***	S	-6.693***	S
$\Delta LnM2GDP$	-6.432***	S	-6.527***	S
$\Delta LnMC$	-4.017***	S	-4.248***	S
$\Delta LnRGDP$	-4.382***	S	-6.178***	S
$\Delta RBLR$	-11.28***	S	-11.323***	S
$\Delta LnRXR$	-7.476***	S	-7.817***	S
$\Delta LnTFS$	-5.657***	S	-5.555***	S

Variable	No Trend	Result	Trend	Result
$\Delta LnTO$	-4.371***	S	-4.615***	S
$\Delta LnTR$	-3.258**	S	-3.065	N

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and L is the log operator. *, ** and **** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively.

As can be seen from Tables G1 to G4, all the variables are either I(0) or I(1) using both tests for Ghana. The thesis therefore rejects the null hypothesis that the variables have unit roots on the basis of Akaike Information Criteria (AIC) and the Newey-West bandwidth, as well as the serial correlation diagnostic tests from the stationarity regression results. Hence, the thesis concludes that there are no I(2) variables in the case of Ghana.

8.2.2 Testing for the McKinnon-Shaw hypothesis and the effects of interest rate liberalisation on economic growth in Ghana

The results from the stationarity tests for the variables in the savings function indicate that the model for Ghana can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001). The calculated F-statistics F_{LnTFS} (LnTFS| LnRGDP, RDR, LnAPDB) = 4.801 at an optimum lag of 5. This is higher than the upper bound critical value of 4.23 at 5% significant level (Table G5)

Table G5: Modelling of Savings Function - Bounds F-test for co-integration.

Dependent variable	Function		F-test statistics			
LnTFS	F_{LnTFS} (LnTFS| LnRGDP, RDR, LnAPDB)		4.801**			
Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: ** denotes statistical significant at the 5% level.

From Table G5, the null hypothesis of non-existence of co-integration among the variables is rejected, implying that there is a long run co-integration relationship amongst the variables when the model is normalised on real total financial savings (LnTFS) in Ghana. The thesis first estimates the ARDL model then uses AIC or SBC to select the optimum lag (see Bahmani-Oskooee and Brooks, 1999; Bahmani-Oskooee and Goswani, 2004 and Bahmani-Oskooee and Karacal, 2006). The AIC based ARDL (2, 0, 3, 2) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table G6 below.

Table G6: Modelling of Savings Function - Results of ARDL (2, 0, 3, 2) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	-11.90	5.05	-2.36	0.027
LnRGDP	1.08	1.01	1.06	0.299
RDR	0.05	0.01	3.78	0.001
LnAPDB	1.44	0.29	5.00	0.000

Notes: Dependent variable: LnTFS

The long run model results (Table G6) reveal that the real interest rate on deposit (RDR) and average population per bank (LnAPDB) are the key determinants of financial savings. The coefficient of 0.05 for RDR is positive, as expected, and is statistically significant at the 1% significant level. It suggests that in the long run, an increase of 1% in the real deposit rate is associated with an increase of $1.10 billion in total financial savings in Ghana[53]. The results also show that real GDP per capita (LnRGDP) has statistically insignificant effect on total financial savings in Ghana, but the sign is what was expected. This can be explained by the fact that post interest rate liberalisation, deposits rates have been running very low compared to lending rates, leading to big spread (see Sections 4.4 and 4.5 above). In addition, customary practice in Ghana favours the acquisition of property than having a high savings balance with the banks, so given the negative real deposit rate it is not a surprise to see that income effect is non-existent in

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[53]LnTFS is in a log form while RDR is in the level form. An anti-log of the coefficient of RDR, which is 0.0471, is 1.11.

Ghana. According to McKinnon and Shaw (1973), low return on bank deposits encourages savers to hold their savings in the form of unproductive assets, such as land and property, rather than the potentially productive bank deposits.

Furthermore, the coefficient of the average population per bank is significant at 1% level, but the sign is not what was expected. The positive sign for this coefficient may suggest that bank branch proliferation leads to increase in savings mobilisation in Ghana. This is contrary to Ghosh (2005) and Chandrasekhar (2007). The short run dynamics of the model are shown in Table G7.

Table G7: Modelling of Savings Function - Results of ARDL (2, 0, 3, 2) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnTFS$_{-2}$	0.32	0.16	2.00	0.055
ΔLnRGDP$_{-1}$	0.89	0.86	1.04	0.307
ΔRDR$_{-1}$	0.01	0.01	0.50	0.616
ΔRDR$_{-2}$	-0.02	0.01	-2.45	0.022
ΔRDR$_{-3}$	-0.01	0.01	-1.73	0.096
ΔLnAPDB$_{-1}$	0.70	0.37	1.92	0.066
ΔLnAPDB$_{-2}$	-0.55	0.38	-1.43	0.165
ecm(-1)	-0.83	0.17	-4.84	0.000

R-Squared		0.565	R-Bar-Squared	0.383
S.E. of Regression		0.454	F-Stat. F(8,26)	3.891[0.004]
Residual Sum of Squares		4.952	DW-statistic	1.965
Akaike Info. Criterion		-26.441	Schwarz Bayesian Criterion	-34.996

Notes: Dependent variable: ΔLnTFS$_{-1}$

Table G7 indicates that the coefficients of ΔLnTFS$_{-2}$, ΔRDR$_{-2}$ and ΔLnAPDB$_{-1}$ are all statistically significant. This implies that real deposit rate, real financial savings and average population per bank have some significant impacts in the long run on total financial savings in Ghana (Table G6) as well as short run impacts. The table also shows that ΔRDR$_{-2}$ and ΔRDR$_{-3}$ have negative and significant impact on total financial savings in the short run. The coefficient of ECM(-1) is found to be statistically significant at 1% level. This confirms the existence of a long run relationship between the variables. The coefficient of ECM term is -0.83, which suggests a

relatively quick rate of adjustment process. This implies that the disequilibrium occurring due to a shock is totally corrected in about 1 year and 3 months at a rate of 83.0% per annum.

Table G8: Modelling of Savings Function - ARDL-VECM model diagnostics tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.002[0.961]
Functional Form: CHSQ(1)	1.903[0.168]
Normality: CHSQ(2)	17.930[0.000]
Hetroscedasticity: CHSQ(1)	0.044[0.833]

The regression for the underlying ARDL model fits very well at R square = 80.0% and it also passes the diagnostic tests against serial correlation, functional form and hetroscedasticity, but fails the test against the normality at 1% significant level as shown in Table G8. However, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures G1 and G2) from the recursive estimation of the model reveals that there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The above findings show that the real deposit rate plays a positive and significant role in increasing the total financial savings. These results clearly support the first part of the McKinnon-Shaw hypothesis in Ghana. Now let us look at the second part of the McKinnon-Shaw hypothesis for Ghana.

The unit root tests performed on the relevant variables in the investment model indicate that the model for Ghana can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001). The calculated F-statistics F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR, RBCB) = 5.667 at an optimum lag of 3. This is higher than the upper bound critical value of 5.23 at 1% significant level (Table G9).

Table G9: Modelling of Investment Function - Bounds F-test for co-integration.

Dependent variable	Function	F-test statistics
LnCPS	F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR, RBCB)	5.667***

Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: *** denotes statistical significant at the 1% level.

Table G9 shows that the null hypothesis of non-existence of co-integration among the variables can be rejected, implying that there is a long run co-integration relationship amongst the variables when the model is normalised on real credit to the private sector (LnCPS) in Ghana. First of all, the thesis estimates the ARDL model then uses AIC or SBC to select the optimum lag (Bahmani-Oskooee and Brooks, 1999; Bahmani-Oskooee and Goswani, 2004 and Bahmani-Oskooee and Karacal, 2006). The AIC based ARDL (3, 2, 3, 0, 1) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table G10 below.

Table G10: Modelling of Investment Function - Results of ARDL (3, 2, 3, 0, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	2.90	0.36	8.05	0.000
LnTFS	1.25	0.54	2.31	0.030
RBLR	0.06	0.05	1.15	0.263
RRR	-0.05	0.05	-1.01	0.323
RBCB	-0.01	0.01	-1.65	0.113

Notes: Dependent variable: LnCPS

The long run results reported in Table G10 show that the total financial savings is the main determinant of credit to the private sector (a proxy for investment) in Ghana. The coefficient of total financial savings (LnTFS) of 1.25 is positive, as expected and statistically significant at 5% level. This implies that an increase in the total financial savings by $1billion would lead to an increase in credit to the private sector by $1.25 billion in the long run. The real bank lending rate (RBLR) is found to be positive but statistically insignificant. This may suggest that the lending

rate of banks does not have an impact on the volume of bank credit to the private sector. However, the real refinance rates (discount rates) and real borrowing from the central bank were found to have unexpected sign, however, it was statistically insignificant. The short run dynamics of the model are shown in Table G11.

Table G11: Modelling of Investment Function - Results of ARDL (3, 2, 3, 0, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnCPS_{-2}$	0.20	0.14	1.39	0.177
$\Delta LnCPS_{-3}$	-0.41	0.14	-2.87	0.008
$\Delta LnTFS_{-1}$	0.49	0.09	5.56	0.000
$\Delta LnTFS_{-2}$	-0.09	0.07	-1.29	0.210
$\Delta RBLR_{-1}$	0.01	0.00	1.03	0.312
$\Delta RBLR_{-2}$	-0.01	0.00	-1.40	0.174
$\Delta RBLR_{-3}$	-0.01	0.00	-2.49	0.019
ΔRRR_{-1}	-0.01	0.00	-1.14	0.263
$\Delta RBCB_{-1}$	-0.01	0.00	-0.15	0.880
ecm(-1)	-0.26	0.15	-1.76	0.091

R-Squared	0.773	R-Bar-Squared		0.645
S.E. of Regression	0.176	F-Stat. F(10,26)		7.838[0.000]
Residual Sum of Squares	0.711	DW-statistic		2.038
Akaike Info. Criterion	6.604	Schwarz Bayesian Criterion		4.672

Notes: Dependent variable: $\Delta LnCPS_{-1}$

Table G11 reports the short run dynamics of the second part of the McKinnon-Shaw hypothesis. The coefficient of ECM(-1) is -0.26 and statistically significant at 10% level. This implies that the disequilibrium occurring due to a shock to the volume of credit advanced by the banks to the private sector is totally corrected in about 3 years 10 months at a rate of about 26.0% per annum. The ECM result also shows that a change in the total financial savings is associated with a positive change in credit to the private sector ($\Delta LnCPS_{-1}$) and is very significant at 1% level. However, both the coefficients of ΔRRR_{-1} and $\Delta RBLR_{-1}$ are statistically insignificant and show that changes in the real refinance rates (discount rates) and real borrowing rates have insignificant impact on the change in credit to the private sector in Ghana.

Table G12: Modelling of Investment Function - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.058[0.810]
Functional Form: CHSQ(1)	1.882[0.170]
Normality: CHSQ(2)	1.279[0.528]
Hetroscedasticity: CHSQ(1)	0.391[0.532]

The regression for the underlying ARDL model fits very well at R square = 94.1% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity as shown in Table G12. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures G3 and G4) from the recursive estimation of the model reveals that there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period.

The above findings show that the total financial savings play a positive and significant role in increasing the volume of credit that the banks extend to the private sector (proxy for investments) in Ghana. These results clearly support the second part of the McKinnon-Shaw hypothesis. We now test for the effects of interest rate liberalisation on the economic growth on the Ghanaian economy.

The outcome of the stationarity tests of the relevant dependent variables indicate that the economic growth model for Ghana can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001). The calculated F-statistics F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR) = 6.383 at an optimum lag of 3. This is higher than the upper bound critical value of 4.63 at 1% significant level (Table G13).

Table G13: Modelling of Economic Growth Function - Bounds F-test for co-integration.

Dependent variable	Function	F-test statistics
LnY = LnRGDP	F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR)	6.383***

Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.50	4.63	2.81	3.76	2.49	3.38

Note: *** denotes statistical significant at the 1% level.

Table G13 indicates that the null hypothesis of non-existence of co-integration among the variables can be rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real GDP per capita. The optimum lag has been determined as in Bahmani-Oskooee and Brooks (1999), Bahmani-Oskooee and Goswani (2004) and Bahmani-Oskooee and Karacal (2006). Thus, the thesis first estimates the ARDL model then uses AIC or SBC to select the optimum lag. The AIC based ARDL (2, 3, 3, 3, 0, 2) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table G14 below.

Table G14: Modelling of Economic Growth Function - Results of ARDL (2, 3, 3, 3, 0, 2) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	9.98	3.88	2.57	0.019
LnK	0.1	0.21	0.48	0.637
LnL	-1.45	1.06	-1.37	0.187
FDI	0.03	0.04	0.53	0.601
LnCPS	0.19	0.11	1.77	0.094
FLIR	0.08	0.07	1.25	0.229

Notes: Dependent variable: LnRGDP = LnY

The long run results reported in Table G14 show that the interest rate liberalisation has no positive long run effect on the economic growth in Ghana. The coefficient of the interest rate liberalisation index is positive, as expected, but statistically insignificant. In fact, all the other variables included in the model, Labour (LnL), Capital Stock (LnK) and Foreign Direct Investments (FDI), bar credit to the private sector (LnCPS), are all statistically insignificant. This

supports previous studies which reported negative or inconclusive long run relationships between economic growth and interest rate liberalisation. It is also observed that the coefficient of credit to the private sector (LnCPS) has the expected sign and is statistically significant at 10% level. The coefficient may suggest that 1% increase in the volume of credit to the private sector in Ghana leads to an increase of about 0.19% in economic growth. The short run dynamics of the model are shown in Table G15. One other result which deserves to be commented on is the insignificance of the coefficient of the Capital Stock. One possible reason could be the low productivity of capital due to wear and tear and obsolescence of capital stock in Ghana.

Table G15: Modelling of Economic Growth Function - Results of ARDL (2, 3, 3, 3, 0, 2) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnRGDP$_{-2}$	0.16	0.12	1.29	0.211
ΔLnK$_{-1}$	0.01	0.04	0.12	0.907
ΔLnK$_{-2}$	-0.07	0.04	-1.89	0.073
ΔLnK$_{-3}$	-0.08	0.03	-2.64	0.015
ΔLnL$_{-1}$	-0.37	0.33	-1.13	0.270
ΔLnL$_{-2}$	-0.81	0.31	-2.62	0.016
ΔLnL$_{-3}$	-2.62	0.40	-6.61	0.000
ΔFDI$_{-1}$	-0.01	0.01	-0.70	0.492
ΔFDI$_{-2}$	-0.00	0.01	-0.03	0.974
ΔFDI$_{-3}$	-0.01	0.01	-1.24	0.227
ΔLnCPS$_{-1}$	0.05	0.02	2.06	0.052
ΔFLIR$_{-1}$	0.05	0.02	2.69	0.013
ΔFLIR$_{-2}$	-0.06	0.02	-3.37	0.003
ecm(-1)	-0.24	0.07	-3.71	0.001

R-Squared	0 .880	R-Bar-Squared	0.760
S.E. of Regression	0.023	F-Stat. F(14,22)	9.112[0.000]
Residual Sum of Squares	0.009	DW-statistic	2.705
Akaike Info. Criterion	82.199	Schwarz Bayesian Criterion	66.896

Notes: Dependent variable: ΔLnRGDP$_{-1}$ = ΔLnY$_{-1}$

Table G15 reports the short run dynamics of the relationship between interest rate liberalisation and economic growth. The coefficient of ECM(-1) is -0.24 and statistically significant at 1% level. This implies that the disequilibrium occurring due to a shock to economic growth is totally corrected in about 4 years 1 month at a rate of about 24.0% per annum. This confirms that there is a long run relationship between interest rate liberalisation and economic growth in Ghana. The ECM results however, show that changes in Labour are associated with negative changes in economic growth ($\Delta LnRGDP_{-1}$). Also, the coefficient of ΔLnK_{-1} shows that a change in the capital stock is positively associated with a change in economic growth, but it is statistically insignificant. Furthermore, the coefficients of changes in the foreign direct investments (ΔFDI_{-1}, ΔFDI_{-2} and ΔFDI_{-3}) are all negatively associated with change in economic growth. However, the coefficient of $\Delta LnCPS_{-1}$ is positive and statistically significant at 10% level.

Table G16: Modelling of Economic Growth Function - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	7.998[0.005]
Functional Form: CHSQ(1)	0.551[0.814]
Normality: CHSQ(2)	0.332[0.847]
Hetroscedasticity: CHSQ(1)	0.130[0.718]

The regression for the underlying ARDL model fits very well at R square = 98.7% and also passes the diagnostic tests against functional form, normality and hetroscedasticity, but fails the test against serial correlation at 1% significant level as shown in Table G16. But an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures G5 and G6) from the recursive estimation of the model reveals that there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. Now let us turn our attention to the effects of capital account liberalisation on economic growth in Ghana.

8.2.3 Testing for the effects of capital account liberalisation on economic growth in Ghana

The unit root tests performed on the relevant variables indicate that equations (7.5) to (7.8) (all economic growth models) can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Ghana. Table G17, shows the results of the calculated F-statistics of joint significance when real GDP per capita is normalised in the ARDL equations (7.5) to (7.8). It indicates that, in all the equations when the variable of interest, the real GDP per capita (LRGDP), is normalised, we can reject the null hypothesis. This implies that there is long run co-integration relationship among the variables in all the equations in Ghana. The optimum lag used in establishing the co-integration is 2 for all the equations.

The thesis first estimates the ARDL models, then uses AIC or SBC to select the optimum lag. The AIC based models were selected because the estimated standard errors obtained using the AIC based models are smaller or are the same as those of the SBC based models (Pesaran and Pesaran, 2009). The foreign direct investment (FDI) and trade openness (TO) variables were excluded from all the equations due to smallness of the sample size. The long run results of the remaining selected models are reported in Tables G18 to G21 below.

Table G17: Bounds F-test for co-integration for all the economic growth models.

Dependent variable	Functions		F-test statistics
LnY = LnRGDP	F_{LnY} (LnY| LnMC, LnCPS, FLCA)		4.560**
	F_{LnY} (LnY| LnVT, LnCPS, FLCA)		5.440***
	F_{LnY} (LnY| LnTR, LnCPS, FLCA)		4.132**
	F_{LnY} (LnY| LnSMDIND, LnCPS, LnINFL)		7.222***
Asymptotic Critical Values			
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%	5%	10%
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: ** and *** denote statistical significant at the 5% and 1% levels respectively.

Table G18: Economic Growth and Market Capitalisation - Results of ARDL (2, 0, 1, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.

C	5.32	1.55	8.97	0.000
LnMC	0.46	0.56	0.82	0.430
LnCPS	5.11	2.02	2.53	0.030
FLCA	-3.21	2.76	-1.17	0.271

Notes: Dependent variable: LnY = LnRGDP

Table G19: Economic Growth and Value of Stock Traded - Results of ARDL (2, 1, 1, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	5.11	1.34	10.21	0.000
LnVT	-0.03	0.75	-0.04	0.965
LnCPS	5.98	3.02	1.98	0.070
FLCA	-3.04	3.86	-0.79	0.449

Notes: Dependent variable: LnY = LnRGDP

Table G20: Economic Growth and Stock Turnover - Results of ARDL (2, 1, 1, 2) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	5.20	1.42	10.35	0.000
LnTR	-1.96	1.39	-1.41	0.197
LnCPS	7.12	2.88	2.47	0.039
FLCA	-4.49	4.27	-1.05	0.323

Notes: Dependent variable: LnY = LnRGDP

Table G21: Economic Growth and Stock Market Developments - Results of ARDL (2, 0, 1, 0) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	5.24	1.59	8.46	0.000
LnSMDIND	-0.50	1.15	-0.44	0.670
LnCPS	5.27	3.86	2.36	0.092
LnINFL	-1.41	8.86	-0.16	0.460

Notes: Dependent variable: LnY = LnRGDP

Table G18 shows that the coefficient of Market Capitalisation (LnMC) has a statistically, insignificant positive effect on economic growth (LnRGDP) in the long run. It also indicates that the coefficient of (FLCA), an indicator for the policy changes throughout the implementation of capital account liberalisation policy in Ghana, is statistically insignificant and has an unexpected negative sign. This may suggest that, contrary to priori expectation, in the long run stock market capitalisation together with capital account liberalisation policies have negligible or negative impact on economic growth in Ghana. On the other hand, the Table shows that the coefficient of the credit to the private sector is significant at 5% level. Suggesting that a 1% increase in the amount of credit extended to the private sector leads to about 5.1% increase in economic growth.

In Table G19, the coefficients of value of stock traded (LnVT) and FLCA are statistically insignificant and have negative effect on economic growth (LnRGDP) in the long run. However, like in Table 18, the coefficient of the credit to the private sector has the expected sign and statistically significant at 10% level.

Table G20 shows that the coefficients of stock turnover (LnTR) and FLCA are statistically insignificant and have negative effects on economic growth (LnRGDP) in the long run. However, as in Tables 18 and 19, the coefficient of the credit to the private sector has the expected sign and statistically significant at 5% level.

Table G21 shows that the combined index for the three proxies of stock market development (LnSMDIND is statistically insignificant and have negative effect on economic growth (LnRGDP). It also shows that credit to the private sector (LnCPS) has a positive and significant impact on economic growth in Ghana at 10% significant level. Thus, a 1% increase in the credit to the private sector leads to about 5.3% increase in economic growth. The coefficient of inflation is negative, as expected, but statistically insignificant. The results of the short run dynamic emanating from the long run relationships are shown in Tables G22 to G25.

Table G22: Economic Growth and Market capitalisation - Results of ARDL (2, 0, 1, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	-1.05	0.61	-1.96	0.092
$\Delta LnMC_{-1}$	0.01	0.00	0.68	0.511
$\Delta LnCPS_{-1}$	0.03	0.01	4.17	0.001
$\Delta FLCA_{-1}$	0.01	0.01	0.90	0.386
Ecm(-1)	-0.01	0.00	-2.18	0.048

R-Squared	0.888	R-Bar-Squared		0.833
S.E. of Regression	0.005	F-Stat. F(5,10)		26.545[0.000]
Residual Sum of Squares	0.207E-3	DW-statistic		1.995
Akaike Info. Criterion	61.6634	Schwarz Bayesian Criterion		59.346

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table G23: Economic Growth and Value of Stock Traded - Results of ARDL (2, 1, 1, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	0.03	0.54	0.05	0.976
$\Delta LnVT_{-1}$	-0.01	0.00	-0.04	0.966
$\Delta LnCPS_{-1}$	0.03	0.01	4.12	0.001
$\Delta FLCA_{-1}$	0.01	0.01	0.84	0.415
Ecm(-1)	-0.01	0.00	-1.96	0.071

R-Squared	0.883	R-Bar-Squared		0.825
S.E. of Regression	0.005	F-Stat. F(5,10)		25.238 [0.000]
Residual Sum of Squares	0.209E-3	DW-statistic		2.050
Akaike Info. Criterion	61.306	Schwarz Bayesian Criterion		58.988

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table G24: Economic Growth and Stock Turnover - Results of ARDL (2, 1, 1, 2) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	0.04	0.51	0.05	0.980
$\Delta LnTR_{-1}$	-0.01	0.00	-0.37	0.719
$\Delta LnCPS_{-1}$	0.04	0.01	4.37	0.001
$\Delta FLCA_{-1}$	-0.01	0.01	-0.31	0.760
$\Delta FLCA_{-2}$	-0.01	0.01	-1.06	0.311
Ecm(-1)	-0.01	0.00	-2.68	0.021

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
R-Squared	0.917	R-Bar-Squared		0.844
S.E. of Regression	0.006	F-Stat. F(6,9)		22.331[0.000]
Residual Sum of Squares	0.206E-3	DW-statistic		2.130
Akaike Info. Criterion	61.998	Schwarz Bayesian Criterion		58.908

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table G25: Economic Growth and Stock Market Developments - Results of ARDL (2, 0, 1, 0) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	-0.70	0.38	-1.58	0.145
$\Delta LnSMDIND_{-1}$	-0.01	0.00	-0.58	0.570
$\Delta LnCPS_{-1}$	0.02	0.01	3.05	0.010
$\Delta LnINFL_{-1}$	-0.01	0.02	-0.18	0.857
Ecm (-1)	-0.01	0.00	-0.97	0.357
R-Squared	0.806	R-Bar-Squared		0.736
S.E. of Regression	0.006	F-Stat. F(5,10)		15.944[0.000]
Residual Sum of Squares	0.328E-3	DW-statistic		1.618
Akaike Info. Criterion	58.252	Schwarz Bayesian Criterion		56.320

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

As can be seen from Table G22, the coefficient of the changes in the credit to the private sector variable is statistically significant at 1% level. This implies that in addition to having a statistically long run positive impact, changes in credit to the private sector (LnCPS) are also associated with positive impact on economic growth in the short run. The coefficient of the change in LnMC has the expected sign but is statistically insignificant. However, the coefficient of the change in the second lag of LnRGDP is significant at 10% but has a sign contrary to a priori expectation. The coefficient of ECM(-1) is found to be very small in magnitude and statistically significant at 5% as well as having the expected negative sign. The ECM coefficient of about -0.01, suggests a very slow and long adjustment process to equilibrium after a shock in the economic growth process.

In Table G23, the coefficient of the change in the credit to the private sector variable is statistically significant at 1% level. The coefficient of the changes in LnVT is statistically insignificant and has a sign contrary to a priori expectation. The coefficient ECM(-1) is also

found to be very small in magnitude and statistically significant at 10% as well as having the expected negative sign.

As in Table G23, Table G24 shows that the coefficient of the change in the credit to the private sector variable is statistically significant at 1% level. The coefficient of the changes in LnTR is statistically insignificant, and like all the other proxies of stock market development, has a sign contrary to a priori expectation. The coefficient ECM(-1) is found to be very small in magnitude and statistically significant at 5% as well as having the expected negative sign.

Finally in this sub-section, as can be seen from Table G25, the coefficient of the changes in the combined stock development index (LnSMDIND) is statistically insignificant. However, the coefficient of change in the credit to the private sector is significant at 1% whilst the coefficient in the change in inflation is statistically insignificant. As expected, the coefficient of the change in LnINFL has a negative sign. The coefficient of the ECM(-1) is found to be very small in magnitude and statistically insignificant, but has the expected negative sign.

Table G26: Economic Growth and Market capitalisation - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.001[0.994]
Functional Form: CHSQ(1)	9.140 [0.003]
Normality: CHSQ(2)	0.609 [0.748]
Hetroscedasticity: CHSQ(1)	0.391 [0.632]

Table G27: Economic Growth and Value of Stock Traded - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.076 [0.780]
Functional Form: CHSQ(1)	8.218 [0.008]
Normality: CHSQ(2)	0.396 [0.822]
Hetroscedasticity: CHSQ(1)	0.399 [0.517]

Table G28: Economic Growth and Stock Turnover - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.0754 [0.078]
Functional Form: CHSQ(1)	9.219 [0.005]
Normality: CHSQ(2)	0.396 [0.831]
Hetroscedasticity: CHSQ(1)	0.399 [0.531]

Table G29: Economic Growth and Stock Market Developments - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	1.764 [0.194]
Functional Form: CHSQ(1)	9.003 [0.012]
Normality: CHSQ(2)	5.763 [0.066]
Hetroscedasticity: CHSQ(1)	1.582 [0.218]

The regressions for the underlying ARDL models fit very well at R square = 99.9% for equations (7.5) to (7.7) and 99.7% for equation (7.8). All the equations fail the test against functional form at 1% significant level, as shown in Tables G26 to G29. However, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures G7 to G14) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficients at 5% significant level over the sample period. Lastly in this sub-section, the thesis looks at the combined effects of interest rates and capital account liberalisation on economic growth in Ghana.

8.2.4   Testing for the effects of both interest rate and capital account liberalisation on economic growth in Ghana

The results from the stationarity tests for the relevant variables indicate that equation 7.9 - the long run economic growth model - can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Ghana. The calculated F-statistics F_{LnRGDP} (LnRGDP| LnK, LnL, FDI, LnGEXP, LnRXR, LnINFL, FLBL) = 3.562 at optimum lag of 2. This is higher than the upper bound critical value of 3.50 at the 5% significant level (Table G30).

Table G30: Economic Growth and financial liberalisation - Bounds F-test for co-integration.

Dependent variable	Function			F-test statistics	
LnY = LnRGDP	F_{LnY} (LnY| LnL, LnK, FDI, LnGEXP, LnRXR, LnINFL, FLBL)			3.562**	
Asymptotic Critical Values					
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.07	4.23	2.50	3.50	2.22	3.17

Note: ** denotes statistical significant at the 5% level.

The outcome of the F-statistics above reveals that the null hypothesis of non-existence of co-integration among the variables can be rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real GDP per capita (LnRGDP) in Ghana. The thesis first estimates the ARDL model, then uses AIC or SBC to select the optimum lag (see Bahmani-Oskooee and Brooks, 1999; Bahmani-Oskooee and Goswani, 2004 and Bahmani-Oskooee and Karacal, 2006 for details of how the thesis estimated the optimum lag). The AIC based ARDL (2, 2, 0, 0, 0, 2, 2, 1) model was selected as it has the same mean prediction errors as well as a lower estimated standard error to that of the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table G31 below.

Table G31: Economic Growth and financial liberalisation - Results of ARDL (2, 2, 0, 0, 0, 2, 2, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	8.32	5.54	1.50	0.148
LnK	0.89	0.50	1.77	0.091
LnL	-0.82	1.29	-0.64	0.530
FDI	-0.04	0.04	-1.06	0.302
LnGEXP	0.32	0.25	1.28	0.215
LnRXR	-0.73	0.62	-1.18	0.252

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
LnINFL	-1.04	0.55	-1.91	0.070
FLBL	-0.01	0.03	-0.51	0.618

Notes: Dependent variable: LnY = LnRGDP

Table G31 shows that the coefficient of the real government expenditure (LnGEXP) and real export revenue (LnRXR) are both statistically insignificant and have the unexpected a priori sign. The coefficient of inflation (LnINFL) is statistically significant and has the expected negative sign. Furthermore, the coefficient of the combined financial liberalisation index (FLBL), which serves as the proxy of changes and implementation of the policy, has the unexpected negative sign but it is statistically insignificant. The coefficient of foreign direct investments (FDI) has the unexpected negative sign but it is also statistically insignificant. However, capital accumulation (LnK) has the expected sign as well as statistically significant at 10% level. Thus, a 1% increase in capital accumulation leads to an increase of about 0.89% in economic growth in the long run. The coefficient of real export revenue (LnRXR) has the unexpected negative sign, although it is statistically insignificant. However, the negative relationship between real export and economic growth may suggest the existence of "immiserizing growth" effect (Bhagwati, 1958) in the Ghanaian Economy[54]. Furthermore, the negative relationship between the labour factor and economic growth may indicate the growing unemployment problem and the low productivity of labour in Ghana. The short run dynamics of the model are shown in Table G32.

Another interesting finding is the insignificant and negative relationship between financial liberalisation and economic growth in the long run. This may suggest that in Ghana, the effect of financial liberalisation is non-existent. This may be due to the fact that, as Ghana is a primary commodity exporter, export revenue contributes significantly to economic growth than financial policies or the financial sector.

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[54]Note that Ivory Coast is the largest exporter of cocoa bean whilst Ghana is the second largest exporter.

Table G32: Economic Growth and financial liberalisation - Results of ARDL (2, 2, 0, 0, 0, 2, 2, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	0.26	0.14	1.85	0.076
ΔLnK_{-1}	0.08	0.04	2.13	0.043
ΔLnK_{-2}	-0.12	0.03	-3.62	0.001
ΔLnL_{-1}	-0.17	0.22	-0.76	0.456
ΔFDI_{-1}	-0.01	0.01	-1.64	0.113
$\Delta LnGEXP_{-1}$	0.07	0.04	1.48	0.152
$\Delta LnRXR_{-1}$	-0.27	0.05	-5.09	0.000
$\Delta LnRXR_{-2}$	0.08	0.05	1.59	0.125
$\Delta LnINFL_{-1}$	-0.17	0.04	-4.54	0.000
$\Delta LnINFL_{-2}$	0.16	0.04	4.01	0.000
$\Delta FLBL_{-1}$	-0.02	0.01	-1.63	0.115
Ecm (-1)	-0.20	0.11	-1.86	0.074

R-Squared	0.814	R-Bar-Squared		0.673
S.E. of Regression	0.026	F-Stat. F(12, 25)		7.678[0.000]
Residual Sum of Squares	0.014	DW-statistic		2.380
Akaike Info. Criterion	79.006	Schwarz Bayesian Criterion		65.086

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

The effect is that the impact of financial liberalisation policies is somehow obscured in the economic growth process. Also, one other reason may be the underdeveloped nature of the financial sector in Ghana.

The coefficients of $\Delta LnRGDP_{-2}$, ΔLnK_{-1}, ΔLnK_{-2}, $\Delta LnRXR_{-1}$, $\Delta LnINFL_{-1}$ and $\Delta LnINFL_{-2}$ are all statistically significant. On the other hand, the coefficients of ΔFDI_{-1}, ΔLnL_{-1}, $\Delta LnGXEP_{-1}$ and $\Delta FLBL_{-1}$ are all statistically insignificant. The coefficient of ECM(-1) is found to be statistically significant at 10% level with the expected negative sign. This confirms the existence of a long run relationship between the variables. The coefficient of ECM(-1) term is -0.20, which suggests a relative slow rate of adjustment process. The magnitude of the coefficient of the ECM(-1) implies that the disequilibrium occurring due to a shock is totally corrected in about 4 years and 11 months at a rate of 20.0% per annum.

Table G33: Economic Growth and financial liberalisation - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	2.484[0.115]
Functional Form: CHSQ(1)	1.431[0.232]
Normality: CHSQ(2)	1.046[0.593]
Hetroscedasticity: CHSQ(1)	0.109[0.741]

The regression for the underlying ARDL model fits very well at R square = 98.06% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Table G33. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (see Figures G15 and G16) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The thesis now looks at the case of the Nigerian economy.

8. 3   Empirical findings and analysis for Nigeria

In this section, the thesis presents the empirical results and analysis based on the specified models, methodology and time series data from Nigeria. As discussed in section 7.4.1, before the thesis goes ahead with the ARDL bounds testing, it will first test for the stationarity of all the variables that are going to be used in the analysis to ensure that they are all in the order of I(0) or I(1) stationary so as to avoid spurious results (Ouattara, 2004).

8.3.1   Unit root tests for variables from Nigeria

As shown in section 7.4.1, the results of the Dickey-Fuller generalised least squares (DF-GLS) and the Phillips and Peron (PP) unit root tests for Nigeria are reported in Tables N1 to N4 below. The DF-GLS lag length is selected automatically by AIC whilst the PP truncation lag is selected automatically on the Newey-West bandwidth.

Table N1: DF-GLS unit root tests for the Nigerian variables in levels.

Variable	No Trend	Result	Trend	Result
LnAPDB	-0.680	N	-1.568	N
LnCPS	0.368	N	-2.406	N
FDI	-1.558	N	-2.806	N
FLBL	0.961	N	-1.671	N
FLCA	-0.564	N	-1.790	N
FLIR	0.846	N	-1.827	N
LnGDIGDP	-1.362	N	-1.942	N
LnGDSGDP	-1.673	N	-2.094	N
LnGEXP	-0.965	N	-2.558	N
LnINFL	-3.602***	S	-3.800***	S
LnK	-0.933	N	-1.636	N
LnL	-3.400***	S	-3.479**	S
LnM2GDP	-1.764*	S	-2.079***	S
LnMC	-1.281	N	-4.148***	S
LnRGDP	-1.485	N	-2.116	N
RBCB	-1.843*	S	-2.900*	S
RBLR	-3.907***	S	-4.392***	S
RDR	-4.137***	S	-4.406***	S
RRR	-4.062***	S	-4.305***	S
LnRXR	-1.165	N	-2.686	N
LnSMDIND	-5.187***	S	-5.253***	S
LnTFS	-1.165	N	-1.490	N
LnTO	-1.165	N	-2.686	N
LnTR	-0.197	N	-2.480	N
LnVT	0.048	N	-1.749	N

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. L is the log operator. The log of one plus the inflation rates were used to diminish the impact of some outlier observations.

Table N2: DF-GLS unit root tests for the Nigerian variables in first differences.

Variable	No Trend	Result	Trend	Result
$\Delta LnAPDB$	-4.826***	S	-5.212***	S
$\Delta LnCPS$	-4.258***	S	-4.445***	S
ΔFDI	-10.65***	S	-10.44***	S
$\Delta FLBL$	-5.927***	S	-6.379***	S
$\Delta FLCA$	-2.074**	S	-2.234***	S
$\Delta FLIR$	-6.114***	S	-6.529***	S
$\Delta LnGDIGDP$	-1.790*	S	-4.178***	S
$\Delta LnGDSGDP$	-2.347**	S	-5.132***	S
$\Delta LnGEXP$	-2.075**	S	-2.746	N
ΔLnK	-4.597***	S	-5.026***	S
$\Delta LnMC$	-5.908***	S	-5.063***	S
$\Delta LnRGDP$	-2.743***	S	-4.069***	S
$\Delta LnRXR$	-5.540***	S	-5.951***	S
$\Delta LnTFS$	-1.858*	S	-4.949***	S
$\Delta LnTO$	-5.540***	S	-5.951***	S
$\Delta LnTR$	-3.251***	S	-3.532**	S
$\Delta LnVT$	-0.539	N	-6.778***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and L is the log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively.

Table N3: PP unit root tests for the Nigerian variables in levels.

Variable	No Trend	Result	Trend	Result
$LnAPDB$	-2.176	N	-2.150	N
$LnCPS$	-1.507	N	-1.992	N
FDI	-3.282**	S	-4.977***	S
$FLBL$	0.577	N	-2.157	N
$FLCA$	0.175	N	-1.914	N
$FLIR$	0.438	N	-2.263	N
$LnGDIGDP$	-2.921*	S	-3.014	N
$LnGDSGDP$	-2.338	N	-3.004	N

Variable	No Trend	Result	Trend	Result
LnGEXP	-2.077	N	-2.135	N
LnINFL	-3.035**	S	-2.962	N
LnK	-2.339	N	-2.280	N
LnL	-1.730	N	-2.306	N
LnM2GDP	-1.481	N	-1.6162	N
LnMC	-1.156	N	-3.938**	S
LnRGDP	-2.348	N	-2.333	N
RBCB	-2.272	N	-2.197	N
RBLRN	-3.356**	S	-3.493*	S
RDRN	-3.425**	S	-3.479**	S
RRRN	-3.319**	S	-3.350*	S
LnRXR	-2.854*	S	-3.203*	S
LnSMDIND	-7.152***	S	-12.228***	S
LnTFS	-1.957	N	-2.122	N
LnTO	-2.854*	S	-3.203*	S
LnTR	-0.232	N	-2.696	N
LnVT	3.303**	S	-0.524	N

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. L is the log operator. The log of one plus the inflation rates were used to diminish the impact of some outlier observations.

Table N4: PP unit root tests for the Nigerian variables in first differences.

Variable	No Trend	Result	Trend	Result
ΔLnAPDB	-5.288***	S	-5.208***	S
ΔLnCPS	-4.503***	S	-4.434***	S
ΔFLBL	-6.066***	S	-6.224***	S
ΔFLCA	-5.881***	S	-5.950***	S
ΔFLIR	-6.229***	S	-6.369***	S
ΔLnGDIGDP	-5.738***	S	-5.727***	S
ΔLnGDSGDP	-5.494***	S	-5.374***	S
ΔLnGEXP	-4.848***	S	-4.776***	S

Variable	No Trend	Result	Trend	Result
$\Delta LnINFL$	-11.34***	S	-12.43***	S
ΔLnK	-5.069***	S	-4.985***	S
$\Delta LnM2GDP$	-4.960***	S	-4.918***	S
$\Delta LnMC$	-11.64***	S	-13.573***	S
$\Delta LnRGDP$	-5.727***	S	-5.750***	S
$\Delta RBCB$	-6.002***	S	-5.979***	S
$\Delta LnTFS$	-5.056***	S	-4.979***	S
$\Delta LnTR$	-5.535***	S	-5.310***	S
$\Delta LnVT$	-4.741***	S	-13.500***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and L is the log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively.

As can be seen from Tables N1 to N4, all the variables are either I(0) or I(1) using both tests for Nigeria. The thesis therefore rejects the null hypothesis that the variables have unit roots on the basis of Akaike Information Criteria (AIC) and the Newey-West bandwidth as well as the serial correlation diagnostic tests from the stationarity regression results. Hence, the thesis concludes that there are no I(2) variables in the case of Nigeria.

8.3.2 Testing for the McKinnon-Shaw hypothesis and the effects of interest rate liberalisation on economic growth in Nigeria

The results from the stationarity tests of the relevant variables indicate that the savings model can be implemented as an ARDL model using bounds testing approach as in Pesaran (2001) for Nigeria. The calculated F-statistics F_{LnTFS} (LnTFS| LnRGDP, RDR, LnAPDB) = 6.821 at an optimum lag of 2. This is higher than the upper bound critical value of 5.23 at 1% significant level (Table N5)

Table N5: Modelling of Savings Function - Bounds F-test for co-integration.

Dependent variable	Function	F-test statistics
LnTFS	F_{LnTFS} (LnTFS| LnRGDP, RDR,	6.821***

	LnAPDB)	
Asymptotic Critical Values		

Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: *** denotes statistical significant at the 1% level.

Table N5 indicates that the null hypothesis of non-existence of co-integration among the variables can be rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real total financial savings (LnTFS) in Nigeria. The thesis first estimates the ARDL model, then uses AIC or SBC to select the optimum lag. In determining the optimum lag, the thesis has followed Bahmani-Oskooee and Brooks (1999), Bahmani-Oskooee and Goswani (2004) and Bahmani-Oskooee and Karacal (2006). The SBC based ARDL (2, 0, 0, 2) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the AIC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table N6 below.

Table N6: Modelling of Savings Function - Results of ARDL (2, 0, 0, 2) long run model selected on SBC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	12.18	17.16	0.71	0.483
LnRGDP	-2.40	2.76	-0.87	0.392
RDR	0.07	0.04	1.69	0.100
LnAPDB	1.12	0.28	4.02	0.000

Notes: Dependent variable: LnTFS

The long run model results (Table N6) reveal that the real interest rate on deposit (RDR) and average population per bank (LnAPDB) proxied by broad money (M2) divided by population in Nigeria are the key determinants of financial savings. The coefficient of 0.07 for RDR is positive, as expected, and is statistically significant at the 10% significant level. It suggests that in the long run, an increase of 1% in the real deposit rate is associated with an increase of $1.18

billion in total financial savings in Nigeria[55]. The results also show that real GDP per capita (LnRGDP) has statistically insignificant effect on economics growth in Nigeria. Furthermore, the sign is not what was expected. One possible reason could be customary practice in most West African countries that favours the acquisition of property over having a high savings balance with the banks, so given the negative real deposit rate it is not a surprise to see that income effect is non-existent in Nigeria. According to McKinnon (1973) and Shaw (1973), low return on bank deposits encourages savers to hold their savings in the form of unproductive assets, such as land and property, rather than the potentially productive bank deposits. The coefficient of the average population per bank in Nigeria is significant at 1% level, but the sign is not what was expected. The positive sign for this coefficient may suggest that bank branch proliferation leads to increase in savings mobilisation in Nigeria. This is contrary to Ghosh (2005) and Chandrasekhar (2007). The short run dynamics of the model are shown in Table N7.

Table N7: Modelling of Savings Function - Results of ARDL (2, 0, 0, 2) ECM model selected on SBC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnTFS$_{-2}$	-0.37	0.15	-2.52	0.017
ΔLnRGDP$_{-1}$	-0.15	0.15	-1.01	0.319
ΔRDR$_{-1}$	0.01	0.01	3.46	0.002
ΔLnAPDB$_{-1}$	1.01	0.04	25.19	0.000
ΔLnAPDB$_{-2}$	0.44	0.15	3.00	0.005
ecm(-1)	-0.06	0.03	-1.73	0.093

R-Squared	0.971	R-Bar-Squared	0.964	
S.E. of Regression	0.068	F-Stat. F(6,31)	168.265[0.000]	
Residual Sum of Squares	0.140	DW-statistic	1.990	
Akaike Info. Criterion	44.582	Schwarz Bayesian Criterion	38.032	

Notes: Dependent variable: ΔLnTFS$_{-1}$

Table N7 indicates that the coefficients of ΔLnTFS$_{-2}$, ΔRDR$_{-1}$, ΔLnAPDB$_{-1}$ and ΔLnAPDB$_{-2}$ are all statistically significant, but ΔLnTFS$_{-2}$ has negative impact. This implies that real deposit rate and average population per bank have significant impact in the long run on total financial savings (Table N6) as well as short run impacts. The table also shows that ΔLnRGDP$_{-1}$ has

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[55]LnTFS is in a log form while RDR is in the level form. An anti-log of the coefficient of RDR, which is 0.070385, is 1.18.

negative and insignificant impact on total financial savings in the short run. The coefficient of ECM(-1) is found to be statistically significant at 10% level and has the expected negative sign. This confirms the existence of a long run relationship between the variables. The coefficient of ECM term is -0.06, which suggests a very slow rate of adjustment process. This implies that the disequilibrium occurring due to a shock is totally corrected in about 16 years and 2 months at a rate of 6.0% per annum.

Table N8: Modelling of Savings Function - ARDL-VECM model diagnostics tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.064[0.800]
Functional Form: CHSQ(1)	0.951[0.329]
Normality: CHSQ(2)	0.225[0.894]
Hetroscedasticity: CHSQ(1)	0.009[0.927]

The regression for the underlying ARDL model fits very well at R square = 99.5% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Table N8. Also, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures N1 and N2) from the recursive estimation of the model reveals that there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The above findings show that the real deposit rate plays a positive and significant role in increasing the total financial savings. These results clearly support the first part of the McKinnon-Shaw hypothesis in Nigeria. Now let us look at the second part of the McKinnon-Shaw hypothesis in Nigeria.

The unit root tests of the variables in the investment function indicate that the model can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Nigeria. The calculated F-statistics F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR) = 5.097 at an optimum lag of 5. This is higher than the upper bound critical value of 4.23 at 5% significant level (Table N9).

Table N9: Modelling of Investment Function - Bounds F-test for co-integration.

Dependent variable	Function				F-test statistics	
LnCPS	F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR)				5.097**	
Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: ** denotes statistical significant at the 5% level.

The results of the F-statistics suggest that the null hypothesis of non-existence of co-integration among the variables can be rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real credit to the private sector (LnCPS). The SBC based ARDL (2, 1, 5, 5) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the AIC based model (Shrestha and Chowdhury, 2007). The real borrowing from central bank (RBCB) variable has been excluded as it is statistically insignificant. The long run results of the selected model are reported in Table N10 below.

Table N10: Modelling of Investment Function - Results of ARDL (2, 1, 5, 5) long run model selected on SBC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	-0.35	0.20	-1.74	0.099
LnTFS	1.13	0.06	18.30	0.000
RBLR	0.17	0.03	5.28	0.000
RRR	-0.18	0.04	-4.87	0.000

Notes: Dependent variable: LnCPS

The long run results reported in Table N10 show that the total financial savings is the main determinant of credit to the private sector (a proxy for investment) in Nigeria. The coefficient of total financial savings (LnTFS) of 1.13 is positive, as expected, and statistically significant at 1% level. This implies that an increase in the total financial savings by $1billion would lead to an increase in credit to the private sector by $1.13 billion in the long run. The real bank lending rate

(RBLR) is found to be positive and statistically significant at 1%. This may suggest that the lending rate of banks does have an impact on the volume of bank credit to the private sector. Similar findings were made in Ghana. The real refinance rates (discount rates) also were found to have the expected sign and statistically significant at 1% in the long run. The short run dynamics of the model are shown in Table N11.

Table N11: Modelling of Investment Function - Results of ARDL (2, 1, 5, 5) ECM model selected on SBC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnCPS_{-2}$	-0.12	0.07	-1.85	0.079
$\Delta LnTFS_{-1}$	0.87	0.05	16.05	0.000
$\Delta RBLR_{-1}$	0.01	0.01	0.25	0.808
$\Delta RBLR_{-2}$	-0.07	0.02	-3.42	0.003
$\Delta RBLR_{-3}$	-0.04	0.02	-1.95	0.065
$\Delta RBLR_{-4}$	-0.07	0.02	-3.56	0.002
$\Delta RBLR_{-5}$	-0.06	0.01	-4.24	0.000
ΔRRR_{-1}	-0.01	0.01	-0.42	0.679
ΔRRR_{-2}	0.07	0.02	3.48	0.002
ΔRRR_{-3}	0.04	0.02	1.96	0.063
ΔRRR_{-4}	0.06	0.02	3.27	0.004
ΔRRR_{-5}	0.06	0.01	4.26	0.000
ecm(-1)	-0.55	0.14	-4.03	0.001

R-Squared	0.968	R-Bar-Squared		0.939
S.E. of Regression	0.091	F-Stat. F(13,21)	41.609[0.000]	
Residual Sum of Squares	0.147	DW-statistic		2.343
Akaike Info. Criterion	29.067	Schwarz Bayesian Criterion	15.847	

Notes: Dependent variable: $\Delta LnCPS_{-1}$

Table N11 reports the short run dynamics of the second part of the McKinnon-Shaw hypothesis. The coefficient of ECM(-1) is -0.55 and statistically significant at 1% level as well as having the expected negative sign. This implies that the disequilibrium occurring due to a shock to the volume of credit advanced by the banks to the private sector is totally corrected in about 1 year 10 months at a rate of about 55.0% per annum. The ECM result also shows that a change in the total financial savings is also associated with a positive change in credit to the private sector

(ΔLnCPS$_{-1}$) and is very significant at 1% level. However, both the coefficients of ΔRRR$_{-1}$ and ΔRBLR$_{-1}$ are statistically insignificant and show that changes in the real refinance rates (discount rates) and real borrowing rates have insignificant impact on the change in credit to the private sector.

Table N12: Modelling of Investment Function - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	1.756[0.185]
Functional Form: CHSQ(1)	0.081[0.776]
Normality: CHSQ(2)	0.364[0.834]
Hetroscedasticity: CHSQ(1)	0.505[0.477]

The regression for the underlying ARDL model fits very well at R square = 99.4% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Table N12. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures N3 and N4) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The above findings show that the total financial savings play a positive and significant role in increasing the volume of credit that the banks extend to the private sector (proxy for investments). These results clearly support the second part of the McKinnon-Shaw hypothesis in Nigeria. We now test for the effects of interest rate liberalisation on the economic growth in the Nigerian economy.

Looking at the economic growth model for Nigeria, the unit root tests of the relevant variables indicate that the model can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001). The calculated F-statistics F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR) = 4.649 at an optimum lag of 4. This is higher than the upper bound critical value of 4.63 at 1% significant level (Table N13).

Table N13: Modelling of Economic Growth Function - Bounds F-test for co-integration.

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Dependent variable	Function			F-test statistics	
LnY = LnRGDP	F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR)			4.649***	
Asymptotic Critical Values					
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.50	4.63	2.81	3.76	2.49	3.38

Note: *** denotes statistical significant at the 1% level.

Thus, the null hypothesis of non-existence of co-integration among the variables is rejected, implying that there is a long run co-integration relationship amongst the variables when the model is normalised on real GDP per capita in Nigeria. The thesis first estimates the ARDL model, then uses AIC or SBC to select the optimum lag (see Bahmani-Oskooee and Brooks, 1999; Bahmani-Oskooee and Goswani, 2004 and Bahmani-Oskooee and Karacal, 2006). The SBC based ARDL (4, 0, 1, 3, 0, 0) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the AIC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table N14 below.

Table N14: Modelling of Economic Growth Function - Results of ARDL (4, 0, 1, 3, 0, 0) long run model selected on SBC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	-18.72	5.74	-3.26	0.004
LnK	0.06	0.03	2.40	0.025
LnL	7.07	1.66	4.25	0.000
FDI	0.05	0.01	3.25	0.004
LnCPS	-0.09	0.03	-2.56	0.018
FLIR	0.06	0.02	3.07	0.006

Notes: Dependent variable: LnRGDP = LnY

The long run results reported in Table N14 show that the interest rate liberalisation has a positive long run effect on the economic growth in Nigeria. The coefficient of the interest rate

liberalisation index is positive, as expected, as well as statistically significant. This suggests that 1% increase in the interest rate liberalisation index, a proxy for policy changes, leads to an increase of 0.06% in economic growth. In fact, all the other variables included in the model, Labour (LnL), Capital Stock (LnK) and Foreign Direct Investments (FDI) are all statistically significant in Nigeria. This supports previous studies [e.g. Roubini and Sala-i-Martin (1992) and Charlier and Ogun (2002) to mention a few] which found long run relationship between economic growth and interest rate liberalisation. It is also observed that the coefficient of credit to the private sector (LnCPS) has a negative sign contrary to expectation. Obamuyi (2009) also finds a negative relationship between credits to the private sector and economic growth. He attributes this to the fact that private sector credits are mainly used to buy and sell instead of for productive activities. The coefficient may suggest that 1% increase in the volume of credit to the private sector leads to a reduction of 0.09% in economic growth. The short run dynamics of the model are shown in Table N15.

Table N15: Modelling of Economic Growth Function - Results of ARDL (4, 0, 1, 3, 0, 0) ECM model selected on SBC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnRGDP$_{-2}$	0.17	0.17	1.00	0.326
ΔLnRGDP$_{-3}$	0.12	0.14	0.88	0.387
ΔLnRGDP$_{-4}$	0.58	0.11	5.04	0.000
ΔLnK$_{-1}$	0.04	0.02	1.94	0.065
ΔLnL$_{-1}$	-3.69	2.03	-1.82	0.081
ΔFDI$_{-1}$	0.01	0.01	0.84	0.410
ΔFDI$_{-2}$	-0.02	0.01	-2.96	0.007
ΔFDI$_{-3}$	-0.01	0.01	-1.96	0.062
ΔLnCPS$_{-1}$	-0.05	0.02	-3.03	0.006
ΔFLIR$_{-1}$	0.03	0.01	4.63	0.000
ecm(-1)	-0.63	0.17	-3.77	0.001

R-Squared	0 .799	R-Bar-Squared	0.680	
S.E. of Regression	0.030	F-Stat. F(11,21)	7.949[0.000]	
Residual Sum of Square	0.020	DW-statistic	2.151	
Akaike Info. Criterion	69.660	Schwarz Bayesian Criterion	58.575	

Notes: Dependent variable: ΔLnRGDP$_{-1}$ = ΔLnY$_{-1}$

Table N15 reports the short run dynamics of the relationship between interest rate liberalisation and economic growth. The coefficient of ECM(-1) is -0.63 and statistically significant. This implies that the disequilibrium occurring due to a shock to economic growth is totally corrected in about 1 year 7 months at a rate of about 63.0% per annum. This confirms that there is a long run relationship between interest rate liberalisation and economic growth in Nigeria. The ECM results however, show that a change in labour is also associated with a negative change in economic growth ($\Delta LnRGDP_{-1}$) and is very significant at 10% level. Also, the coefficient of ΔLnK_{-1} shows that a change in the capital stock is positively associated with change in economic growth and it is statistically significant at 10% level. Furthermore, the coefficient of the change in the foreign direct investments (ΔFDI_{-1}) is positive but statistically insignificant. However, the coefficient of ΔFDI_{-2}, ΔFDI_{-3}, and $\Delta LnCPS_{-1}$ are all negative and statistically significant. These three coefficients may suggest that the bulk of the credit extended to the private sector by the banks and other financial institutions goes into the import business (mostly buying and selling of imported finished consumer goods) rather than production for domestic consumption in the real economy.

Table N16: Modelling of Economic Growth Function - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.627[0.428]
Functional Form: CHSQ(1)	2.414[0.120]
Normality: CHSQ(2)	0.602[0.740]
Hetroscedasticity: CHSQ(1)	0.488[0.485]

The regression for the underlying ARDL model fits very well at R square = 96.1% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity as shown in Table N16. Also, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures N5 and N6) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The thesis now turns its attention to the effect of capital account liberalisation on economic growth in Nigeria.

8.3.3   Testing for the effects of capital account liberalisation on economic growth in Nigeria

The thesis tested for the stationarity of the relevant variables and the results indicate that equations (7.5) to (7.8) (all economic growth models) can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Nigeria. Table N17 shows the results and outcome of the calculated F-statistics of joint significance when real GDP per capita is normalised in the ARDL equations (7.5) to (7.8). It indicates that, in two of the equations when the variable of interest, the real GDP per capita (LRGDP), is normalised, we can reject the null hypothesis. This implies that there is long run co-integration relationship among the variables in those equations. The optimum lag used in establishing the co-integration in all the equations is 2.

In determining the optimum lag, the thesis first estimates the ARDL models, then uses AIC or SBC to select the optimum lag. The AIC based models were selected for the cointegrated equations because the estimated standard errors obtained using the AIC based models are smaller or are the same as those of the SBC based models (Pesaran and Pesaran, 2009). As in the case of Ghana, the foreign direct investment (FDI) and trade openness (TO) variables were excluded from all the equations due to the fact that the sample size was too small. The two equations which did not co-integrate were also excluded from further analysis. The long run results of the two selected models are reported in Tables N18 and N19 below.

Table N17: Bounds F-test for co-integration for all the economic growth models.

Dependent variable	Functions	F-test statistics
LnY = LnRGDP	F_{LnY} (LnY| LnMC, LnCPS, FLCA)	2.216
	F_{LnY} (LnY| LnVT, LnCPS, FLCA)	4.743**
	F_{LnY} (LnY| LnTR, LnCPS, FLCA)	1.034
	F_{LnY} (LnY| LnSMDIND, LnCPS, LnINFL)	4.878**
Asymptotic Critical Values		

Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: ** denotes statistical significant at the 5% levels.

Table N18: Economic Growth and Value of Stock Traded - Results of ARDL (2, 2, 0, 2) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	0.61	0.01	7.44	0.000
LnVT	0.15	0.03	5.46	0.000
LnCPS	0.03	0.02	1.57	0.151
FLCA	-0.11	0.03	-3.93	0.003

Notes: Dependent variable: LnY = LnRGDP

Table N19: Economic Growth and Stock Market Developments - Results of ARDL (2, 2, 0, 0) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	0.56	0.02	3.38	0.012
LnSMDIND	-1.12	0.94	-1.19	0.260
LnCPS	0.22	0.13	1.75	0.098
LnINFL	-0.19	0.36	-0.53	0.604

Notes: Dependent variable: LnY = LnRGDP

In Table N18, the coefficient of value of stock traded (LnVT) has a statistically significant positive effect on economic growth (LnRGDP) in the long run. Thus, a 1% increase in the value of stock traded leads to about 0.14% increase in economic growth in Nigeria. It also indicates that the coefficient of (FLCA), and indicator for the policy changes throughout the implementation of capital account liberalisation policy, has the unexpected sign as well as statistically significant at 1% level. This may suggest that in the long run value of stock traded and capital account liberalisation policies have inverse impact on economic growth in Nigeria.

Table N19 shows the combined index of the three proxies of stock market development indicators (LnSMDIND) has a statistically insignificant and an unexpected negative effect on

economic growth (LnRGDP). It also shows that credit to the private sector (LnCPS) has positive and significant impact on economic growth at 10% significant level. Furthermore, the coefficient of inflation is negative, as expectation, but statistically insignificant. The results of the short run dynamic coefficient emanating from the long run relationships are presented in Tables N20 and N21.

Table N20: Economic Growth and Value of Stock Traded - Results of ARDL (2, 2, 0, 2) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnGDP_{-2}$	0.38	0.16	2.44	0.033
$\Delta LnVT_{-1}$	0.02	0.01	1.50	0.161
$\Delta LnVT_{-2}$	-0.07	0.01	-4.87	0.000
$\Delta LnCPS_{-1}$	0.01	0.01	1.38	0.195
$\Delta FLCA_{-1}$	0.05	0.03	1.69	0.119
$\Delta FLCA_{-2}$	0.05	0.24	1.94	0.078
$Ecm(-1)$	-0.43	0.10	-4.37	0.001

R-Squared	0.896	R-Bar-Squared	0.791
S.E. of Regression	0.013	F-Stat. F(7,12)	11.027[0.000]
Residual Sum of Squares	0.002	DW-statistic	2.345
Akaike Info. Criterion	52.263	Schwarz Bayesian Criterion	47.541

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table N21: Economic Growth and Stock Market Developments - Results of ARDL (2, 2, 0, 0) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	0.54	0.28	1.92	0.080
$\Delta LnSMDIND_{-1}$	-0.04	0.03	-1.29	0.223
$\Delta LnSMDIND_{-2}$	0.06	0.04	1.63	0.130
$\Delta LnCPS_{-1}$	0.04	0.02	2.08	0.059
$\Delta LnINFL_{-1}$	-0.03	0.04	-0.73	0.480
Ecm (-1)	-0.17	0.15	-1.14	0.277

R-Squared	0.622	R-Bar-Squared	0.382
S.E. of Regression	0.023	F-Stat. F(6,13)	5.022[0.013]
Residual Sum of Squares	0.007	DW-statistic	2.568
Akaike Info. Criterion	42.052	Schwarz Bayesian Criterion	38.274

In Table N20, the coefficients of the lag changes in value of stock traded and the capital account liberalisation index variables are statistically significant. The coefficient of ECM(-1) is -0.43 and statistically significant at 1% level. This implies that the disequilibrium occurring due to a shock to economic growth is totally corrected in about 2 years 4 months at a rate of about 43.0% per annum.

Finally, in Table N21, the coefficients of the changes in the credit to the private sector variable and the second lag of the Real GDP per capita are both statistically significant at 10%. But the coefficient of the change in LnSMDIND has sign contrary to a priori expectation as well as being statistically insignificant. The coefficient of the change in LnINFL has the expected negative sign but is statistically insignificant. The coefficient ECM(-1) is found to be small in magnitude and have the expected negative sign but is statistically insignificant.

Table N22: Economic Growth and Value of Stock Traded - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	1.327[0.249]
Functional Form: CHSQ(1)	1.372[0.241]
Normality: CHSQ(2)	0.194[0.908]
Hetroscedasticity: CHSQ(1)	0.031[0.860]

Table N23: Economic Growth and Stock Market Developments - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.638[0.424]
Functional Form: CHSQ(1)	0.061[0.805]
Normality: CHSQ(2)	2.444[0.295]
Hetroscedasticity: CHSQ(1)	0.016[0.898]

The regressions for the underlying ARDL models fit very well at R square = 99.1% for the economic growth and value of stock traded and 96.7% for the economic growth and stock market

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development index. Also, both equations pass all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Tables N22 and N23. Also, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures N7 to N10) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. Finally in this sub-section, the thesis looks at the effects of the combined effects of interest rates and capital account liberalisation on economic growth in Nigeria.

8.3.4   Testing for the effects of both interest rate and capital account liberalisation on economic growth in Nigeria

The stationarity of the relevant variables where tests and the results indicate that equation (7.9) – the long run economic growth model – can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Nigeria. The calculated F-statistics F_{LnRGDP} (LnRGDP| LnK, LnL, FDI, LnGEXP, LnRXR, LnINFL, FLBL) = 6.233 at optimum lag of 2. This is higher than the upper bound critical value of 4.23 at the 1% significant level (Table N24).

Table N24: Economic Growth and Financial Liberalisation - Bounds F-test for co-integration.

Dependent variable	Function		F-test statistics			
LnY = LnRGDP	F_{LnY} (LnY| LnL, LnK, FDI, LnGEXP, LnRXR, LnINFL, FLBL)		6.233***			
Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.07	4.23	2.50	3.50	2.22	3.17

Note: *** denotes statistical significant at the 1% level.

The outcome of the F-statistics above shows that the null hypothesis of non-existence of co-integration among the variables can be rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real GDP per

capita (LnRGDP). First, the thesis estimates the ARDL model, then uses AIC or SBC to select the optimum lag (Bahmani-Oskooee and Brooks, 1999; Bahmani-Oskooee and Goswani, 2004 and Bahmani-Oskooee and Karacal, 2006). The AIC based ARDL (2, 0, 0, 0, 1, 2, 0, 0) model was selected as it has the same mean prediction errors as well as a lower estimated standard error as that of the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table N25 below.

Table N25: Economic Growth and Financial Liberalisation - Results of ARDL (2, 0, 0, 0, 1, 2, 0, 0) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	5.21	5.51	0.95	0.353
LnK	0.26	0.06	4.69	0.000
LnL	0.24	1.58	0.15	0.880
FDI	0.01	0.01	0.90	0.376
LnGEXP	-0.06	0.03	-2.06	0.050
LnRXR	-0.24	0.08	-3.19	0.004
LnINFL	-0.15	0.11	-1.32	0.199
FLBL	0.05	0.01	4.45	0.000

Notes: Dependent variable: LnY = LnRGDP

Table N25 shows that the coefficient of the real government expenditure (LnGEXP) is statistically significant and it has the expected apriori sign. The coefficient of inflation (LnINFL) has the unexpected sign but it is statistically negligible. Furthermore, the coefficient of the combined financial liberalisation index (FLBL) which serves as the proxy of changes and implementation of the policy has a positive sign, as expected, and it is statistically significant at 1% level. Thus, a 1% increase in the financial liberalisation index leads to about 0.1% increase in economic growth. This may suggest that in Nigeria, the effect of financial liberalisation policies is positive on economic growth. The coefficient of foreign direct investments (FDI) has the expected positive sign but is statistically insignificant. Like in Ghana, the coefficient of real export revenue (LnRXR) has the unexpected negative sign and it is statistically significant. Thus, a 1% increase in export revenue leads to a reduction of about 0.1% in economic growth in Nigeria. The negative relationship between real export and economic growth may suggest the

existence of "immiserizing growth" effect (Bhagwati, 1958) in the Nigerian Economy[56]. The short run dynamics of the model are shown in Table N26.

Table N26: Economic Growth and Financial Liberalisation - Results of ARDL (2, 0, 0, 0, 1, 2, 0, 0) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-1}$	-0.23	0.14	-1.56	0.130
ΔLnK_{-1}	0.14	0.03	5.25	0.000
ΔLnL_{-1}	0.13	0.85	0.15	0.882
ΔFDI_{-1}	0.01	0.01	0.88	0.386
$\Delta LnGEXP_{-1}$	-0.07	0.02	-2.95	0.007
$\Delta LnRXR_{-1}$	-0.01	0.02	-0.90	0.376
$\Delta LnRXR_{-2}$	0.10	0.19	5.01	0.000
$\Delta LnINFL_{-1}$	-0.08	0.56	-1.45	0.153
$\Delta FLBL_{-1}$	0.03	0.01	5.07	0.000
Ecm (-1)	-0.54	0.13	-4.21	0.000

R-Squared	0.747	R-Bar-Squared	0.6254
S.E. of Regression	0.034	F-Stat. F(10, 27)	7.378[0.000]
Residual Sum of Squares	0.028	DW-statistic	2.123
Akaike Info. Criterion	70.068	Schwarz Bayesian Criterion	59.424

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

The coefficients of ΔLnK_{-1}, $\Delta LnGEXP_{-1}$, $\Delta LnRXR_{-2}$ and $\Delta FLBL_{-1}$ are all statistically significant. On the other hand, the coefficients of ΔFDI_{-1}, ΔLnL_{-1}, $\Delta LnRXR_{-1}$ and $\Delta LnINFL_{-1}$ are all statistically insignificant. The coefficient of ECM(-1) is found to be statistically significant at 1% level with the expected negative sign. This confirms the existence of a long run relationship between the variables. The coefficient of ECM(-1) term is -0.54, which suggests a relative fast rate of adjustment process. The magnitude of the coefficient of the ECM(-1) implies that the disequilibrium occurring due to a shock is totally corrected in about 1 year and 10 months at a rate of 54.0% per annum.

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[56]Note that Nigeria is one of the largest exporters of crude oil in West Africa.

The regression for the underlying ARDL model fits very well at R square = 94.6% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Table N27. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (see Figures N11 and N12) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period.

Table N27: Economic Growth and Financial Liberalisation - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.349[0.555]
Functional Form: CHSQ(1)	0.333[0.564]
Normality: CHSQ(2)	0.511[0.775]
Hetroscedasticity: CHSQ(1)	1.875[0.171]

8.4 Empirical findings and analysis for Ivory Coast

As in the previous sections, the thesis presents the empirical results and analysis based on the specified models and methodology using time series data from Ivory Coast. As discussed in section 7.4.1 and in the previous section for Ghana and Nigeria. Before the thesis goes ahead with the ARDL bounds testing, it will first test for the stationarity of all the variables that are going to be used in the analysis to ensure that they are all in the order of I(0) or I(1) stationary so as to avoid spurious results (Ouattara, 2004).

8.4.1 Unit root tests for variables from Ivory Coast

The results of the Dickey-Fuller generalised least squares (DF-GLS) and the Phillips and Peron (PP) unit root tests for Ivory Coast are reported in Tables IC1 to IC4 below. The DF-GLS lag length is selected automatically by AIC whilst the PP truncation lag is selected automatically on the Newey-West bandwidth.

Table IC1: DF-GLS unit root tests for the Ivorian variables in levels.

Variable	No Trend	Result	Trend	Result
LnAPDB	-0.887	N	-1.659	N
LnCPS	-0.923	N	-1.422	N
FDI	-2.444**	S	-3.130*	S
FLBL	-0.130	N	-1.752	N
FLCA	-0.722	N	-1.730	N
FLIR	-0.218	N	-1.777	N
LnGDIGDP	-1.003	N	-1.851	N
LnGDSGDP	-1.764*	S	-2.384	N
LnGEXP	-0.983	N	-1.805	N
LnINFL	-3.570***	S	-3.905***	S
LnK	-1.548	N	-1.794	N
LnL	1.051	N	-2.329	N
LnM2GDP	-1.952*	S	-2.174	N
LnMC	-0.275	N	-3.991***	S
LnRGDP	-0.605	N	-2.511	N
RBCB	-1.272	N	-1.454	N
RBLR	-2.289**	S	-2.427	N
RDR	-3.595***	S	-3.752**	S
RRR	-3.433***	S	-3.640**	S
LnRXR	-0.789	N	-2.621	N
LnSMDIND	-4.297***	S	-4.362***	S
LnTFS	-0.146	N	-1.947	N
LnTO	-0.501	N	-2.873	N
LnTR	-3.305***	S	-3.637**	S
LnVT	-1.228	N	-2.826	N

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. L is the log operator. The log of one plus the rates of inflation were used to diminish the impact of some outlier observations.

Table IC2: DF-GLS unit root tests for the Ivorian variables in first differences.

Variable	No Trend	Result	Trend	Result
$\Delta LnAPDB$	-4.701***	S	-4.842***	S
$\Delta LnCPS$	-4.918***	S	-5.172***	S
$\Delta FLBL$	-4.275***	S	-4.372***	S
$\Delta FLCA$	-2.499**	S	-2.781	N
$\Delta FLIR$	-4.484***	S	-4.562***	S
$\Delta LnGDIGDP$	-4.458***	S	-5.012***	S
$\Delta LnGDSGDP$	-6.017***	S	-6.030***	S
$\Delta LnGEXP$	-4.246***	S	-4.791***	S
ΔLnK	-3.905***	S	-4.264***	S
ΔLnL	-6.167***	S	-6.442***	S
$\Delta LnM2GDP$	-5.191***	S	-5.604***	S
$\Delta LnMC$	-3.777***	S	-3.769**	S
$\Delta LnRGDP$	-1.708**	S	-3.840***	S
$\Delta RBCB$	-5.488***	S	-5.623***	S
$\Delta RBLR$	-5.437***	S	-5.765***	S
$\Delta LnRXR$	-6.136***	S	-6.211***	S
$\Delta LnTFS$	-4.006***	S	-4.233***	S
$\Delta LnTO$	-7.148***	S	-7.449***	S
$\Delta LnTR$	-3.875***	S	-4.008***	S
$\Delta LnVT$	-4.867***	S	-5.041***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and L is the log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively.

Table IC3: PP unit root tests for the Ivorian variables in levels.

Variable	No Trend	Result	Trend	Result
$LnAPDB$	-2.540	N	-2.3523	N
$LnCPS$	-2.447	N	-2.2343	N
FDI	-2.331	N	-3.0757	N
$FLBL$	-0.400	N	-1.8044	N
$FLCA$	0.068	N	-1.781	N

Variable	No Trend	Result	Trend	Result
FLIR	-0.566	N	-1.768	N
LnGDIGDP	-1.248	N	-2.038	N
LnGDSGDP	-2.108	N	-2.453	N
LnGEXP	-0.824	N	-2.379	N
LnINFL	-3.530**	S	-4.004**	S
LnK	-1.414	N	-1.382	N
LnL	0.019	N	-2.864	N
LnM2GDP	-2.215	N	-2.544	N
LnMC	-0.379	N	-2.281	N
LnRGDP	-0.253	N	-2.685	N
RBCB	-1.533	N	-1.727	N
RBLR	-2.383	N	-2.336	N
RDR	-3.596**	S	-3.701**	S
RRR	-3.377**	S	-3.511*	S
LnRXR	-1.032	N	-2.831	N
LnSMDIND	-4.783***	S	-5.277***	S
LnTFS	-2.555	N	-2.331	N
LnTO	-0.457	N	-2.976	N
LnTR	-2.584	N	-2.524	N
LnVT	-0.997	N	-2.619	N

Notes: *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively. S = Stationary and N = Non-stationary. L is the log operator. The log of one plus the rates of inflation were used to diminish the impact of some outlier observations.

Table IC4: PP unit root tests for the Ivorian variables in first differences.

Variable	No Trend	Result	Trend	Result
Δ*LnAPDB*	-4.703***	S	-4.7142***	S
Δ*LnCPS*	-4.978***	S	-5.1552***	S
Δ*FDI*	-8.321***	S	-8.2172***	S
Δ*FLBL*	-4.332***	S	-4.2651***	S
Δ*FLCA*	-3.158**	S	-3.179*	S

Variable	No Trend	Result	Trend	Result
$\Delta FLIR$	-4.523***	S	-4.456***	S
$\Delta LnGDIGD$	-5.142***	S	-5.049***	S
$\Delta LnGDSGDP$	-5.948***	S	-5.864***	S
$\Delta LnGEXP$	-4.721***	S	-4.727***	S
ΔLnK	-4.257***	S	-4.332***	S
ΔLnL	-6.401***	S	-6.328***	S
$\Delta LnM2GDP$	-5.675***	S	-5.572***	S
$\Delta LnMC$	-3.427*	S	-3.296*	S
$\Delta LnRGDP$	-5.163***	S	-5.142***	S
$\Delta RBCB$	-5.407***	S	-5.504***	S
$\Delta RBLR$	-5.907***	S	-6.105***	S
$\Delta LnRXR$	-6.267***	S	-6.181***	S
$\Delta LnTFS$	-4.108***	S	-4.166**	S
$\Delta LnTO$	-7.658***	S	-7.858***	S
$\Delta LnTR$	-4.137***	S	-4.219**	S
$\Delta LnVT$	-5.501***	S	-5.865***	S

Notes: S = Stationary and N = Non-stationary. Δ is the difference operator and L is the log operator. *, ** and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significant levels respectively.

As can be seen from Tables IC1 to IC4, all the variables are either I(0) or I(1) using both unit roots tests for Ivory Coast. The thesis therefore rejects the null hypothesis that the variables have unit roots on the basis of Akaike Information Criteria (AIC) and the Newey-West bandwidth as well as the serial correlation diagnostic tests from the stationarity regression results. Hence, the thesis concludes that there are no I(2) variables in the case of Ivory Coast.

8.4.2 Testing for the McKinnon-Shaw hypothesis and the effects interest rate liberalisation on economic growth in Ivory Coast

The stationarity tests of the relevant variables indicate that the savings model can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Ivory Coast. The calculated F-statistics F_{LnTFS} (LnTFS| LnRGDP, RDR, LnAPDB) = 6.066 at an

optimum lag of 4. This is higher than the upper bound critical value of 5.23 at 1% significant level (Table IC5)

Table IC5: Modelling of Savings Function - Bounds F-test for co-integration.

Dependent variable	Function			F-test statistics	
LnTFS	F_{LnTFS} (LnTFS| LnRGDP, RDR, LnAPDB)			6.066***	
Asymptotic Critical Values					
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: *** denotes statistical significant at the 1% level.

Table IC5 shows that the null hypothesis of non-existence of co-integration among the variables can be rejected, implying that there is a long run co-integration relationship amongst the variables when the model is normalised on real total financial savings (LnTFS). Likewise, in the cases of Ghana and Nigeria, in determining the optimum lag, the thesis has followed Bahmani-Oskooee and Brooks (1999), Bahmani-Oskooee and Goswani (2004) and Bahmani-Oskooee and Karacal (2006). First of all, the thesis estimates the ARDL model then uses AIC or SBC to select the optimum lag. The AIC based ARDL (3, 1, 0, 3) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table IC6 below.

Table IC6: Modelling of Savings Function - Results of ARDL (3, 1, 0, 3) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	2.45	1.34	1.83	0.079
LnRGDP	-1.26	0.20	-6.28	0.000
RDR	-0.01	0.01	-0.12	0.906
LnAPDB	1.22	0.13	9.03	0.000

The long run model results (Table IC6) reveal that real GDP per capita (LnRGDP) and average population per bank (LnAPDB) are the key determinants of financial savings in Ivory Coast. However, the real GDP per capita has the unexpected negative relation whilst the average population per bank has unexpected positive relation with total financial savings. The coefficient of 1.22 for LnAPDB is statistically significant at the 1% significant level. It suggests that in the long run, an increase of 1% in the average population per bank is associated with an increase of $1.22 billion in total financial savings. The results also show that real GDP per capita (LnRGDP) is also statistically significant but has negative effect on economic growth. One possible reason could be customary practice in most West African countries that favours the acquisition of property over having a high savings balance with the banks, so given the negative real deposit rate it is not a surprise to see that income effect is negative in Ivory Coast. In fact, similar results were reported in Ghana and Nigeria where the income effects are actually non-existent. The positive sign for the coefficient of LnAPDB may suggest that bank branch proliferation leads to increase in savings mobilisation in Ivory Coast. This is contrary to Ghosh (2005) and Chandrasekhar (2007). The short run dynamics of the model are shown in Table IC7.

Table IC7: Modelling of Savings Function - Results of ARDL (3, 1, 0, 3) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnTFS$_{-2}$	-0.08	0.15	-0.54	0.017
ΔLnTFS$_{-3}$	-0.38	0.15	-2.54	0.595
ΔLnRGDP$_{-1}$	0.19	0.27	0.69	0.494
ΔRDR$_{-1}$	0.00	0.00	-0.12	0.906
ΔLnAPDB$_{-1}$	0.93	0.06	15.69	0.000
ΔLnAPDB$_{-2}$	0.16	0.15	1.04	0.308
ΔLnAPDB$_{-3}$	0.36	0.15	2.42	0.022
ecm(-1)	-0.27	0.08	-3.28	0.003

R-Squared		0.952	R-Bar-Squared	0.933
S.E. of Regression		0.052	F-Stat. F(8,27)	61.814[0.000]
Residual Sum of Squares		0.068	DW-statistic	2.145
Akaike Info. Criterion		50.692	Schwarz Bayesian Criterion	41.983

Notes: Dependent variable: ΔLnTFS$_{-1}$

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Table IC7 indicates that the coefficients of $\Delta LnTFS_{-3}$, $\Delta LnAPDB_{-1}$ and $\Delta LnAPDB_{-3}$ are all statistically significant, but $\Delta LnTFS_{-3}$ has negative impact. This implies that real deposit rate and average population per bank have some short term impact on total financial savings in Ivory Coast (Table IC6). The table also shows that $\Delta LnRGDP_{-1}$ has positive but statistically insignificant effect on total financial savings in the short run. The coefficient of ECM(-1) is found to be statistically significant at 1% level. This confirms the existence of a long run relationship between the variables. The coefficient of ECM term is -0.27, which suggests a slow rate of adjustment process. This means that the disequilibrium occurring due to a shock is totally corrected in about 4 years and 8 months at a rate of 27.0% per annum.

Table IC8: Modelling of Savings Function - ARDL-VECM model diagnostics tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.779[0.378]
Functional Form: CHSQ(1)	2.756[0.097]
Normality: CHSQ(2)	6.689[0.035]
Hetroscedasticity: CHSQ(1)	0.815[0.367]

The regression for the underlying ARDL model fits very well at R square = 99.1% and also passes the diagnostic tests against serial correlation, functional Form and hetroscedasticity, but fails the normality test at 5% significant level, as shown in Table IC8. An inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures IC1 and IC2) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The above findings show that the real deposit rate does not play any significant role in increasing the total financial savings in Ivory Coast. These results do not support the first part of the McKinnon-Shaw hypothesis. Now let us look at the second part of the McKinnon-Shaw hypothesis.

As shown in Tables IC1 to IC4, the stationarity tests of the variables indicate that the investment model can be implemented as an ARDL model using bounds testing approach as in Pesaran et al.

(2001) for Ivory Coast. The calculated F-statistics F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR, RBCB) = 4.587 at an optimum lag of 3. This is higher than the upper bound critical value of 3.97 at 5% significant level (Table IC9).

Table IC9: Modelling of Investment Function - Bounds F-test for co-integration.

Dependent variable	Function			F-test statistics	
LnCPS	F_{LnCPS} (LnCPS| LnTFS, RBLR, RRR, RBCB)			4.587**	
Asymptotic Critical Values					
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.50	4.92	3.05	3.97	2.68	3.53

Note: ** denotes statistical significant at the 5% level.

The results of the F-statistics suggest that the null hypothesis of non-existence of co-integration among the variables can be rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real credit to the private sector (LnCPS). The thesis first estimates the ARDL model, then uses AIC or SBC to select the optimum lag. The AIC based ARDL (2, 3, 3, 3, 0) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table IC10 below.

Table IC10: Modelling of Investment Function - Results of ARDL (2, 3, 3, 3, 0) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	0.29	0.00	10.04	0.000
LnTFS	0.31	0.03	9.60	0.000
RBLR	0.07	0.01	6.38	0.000
RRR	-0.11	0.01	-8.51	0.000
RBCB	0.00	0.00	12.00	0.000

The long run results reported in Table IC10 show that the total financial savings is the main determinant of credit to the private sector (a proxy for investment) in Ivory Coast. The coefficient of total financial savings (LnTFS) of 0.31 is positive, as expected, and statistically significant at 1% level. This implies that an increase in the total financial savings by $1billion would lead to an increase in credit to the private sector by $0.31 billion in the long run. The real bank lending rate (RBLR) is also found to be positive and statistically significant at 1%. This may suggest that the lending rate of banks does have an impact on the volume of bank credit to the private sector. The real refinance rates (discount rates) were also found to have the expected sign and were statistically significant at 1% level. The short run dynamics of the model are shown in Table IC11.

Table IC11: Modelling of Investment Function - Results of ARDL (2, 3, 3, 3, 0) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnCPS$_{-2}$	-0.10	0.09	-1.09	0.288
ΔLnTFS$_{-1}$	0.66	0.06	10.50	0.000
ΔLnTFS$_{-2}$	0.25	0.11	2.28	0.032
ΔLnTFS$_{-3}$	0.07	0.06	1.12	0.273
ΔRBLR$_{-1}$	-0.00	0.01	-0.52	0.605
ΔRBLR$_{-2}$	-0.03	0.01	-3.23	0.004
ΔRBLR$_{-3}$	-0.01	0.01	-2.02	0.055
ΔRRR$_{-1}$	-0.00	0.01	-0.80	0.430
ΔRRR$_{-2}$	0.04	0.01	4.81	0.002
ΔRRR$_{-3}$	0.02	0.01	3.41	0.002
ΔRBCB$_{-1}$	0.00	0.00	6.62	0.000
ecm(-1)	-0.72	0.08	-8.98	0.000

R-Squared	0.960	R-Bar-Squared		0.932
S.E. of Regression	0.052	F-Stat. F(12,24	42.397[0.000]	
Residual Sum of Squares	0.056	DW-statistic		1.891
Akaike Info. Criterion	51.543	Schwarz Bayesian Criterion	38.656	

Notes: Dependent variable: ΔLnCPS$_{-1}$

Table IC11 reports the short run dynamics of the second part of the McKinnon-Shaw hypothesis in Ivory Coast. The coefficient of ECM(-1) is -0.72 and statistically significant at 1% level. This implies that the disequilibrium occurring due to a shock to the volume of credit advanced by the banks to the private sector is totally corrected in about 1 year 5 months at a rate of about 72.0% per annum. The ECM result also shows that a change in the total financial savings is also associated with a positive change in credit to the private sector ($\Delta LnCPS_{-1}$) and is very significant at 1% level. However, both the coefficients of ΔRRR_{-1} and $\Delta RBLR_{-1}$ are statistically insignificant and show that changes in the real refinance rates (discount rates) and real borrowing rates have insignificant impact on the change in credit to the private sector. On the other hand, changes in the real borrowing from the central bank have a positive influence on changes in the amount of credit extended to the private sector.

Table IC12: Modelling of Investment Function - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.008[0.929]
Functional Form: CHSQ(1)	0.522[0.470]
Normality: CHSQ(2)	0.919[0.632]
Hetroscedasticity: CHSQ(1)	0.010[0.922]

The regression for the underlying ARDL model fits very well at R square = 99.2% and also it passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Table IC12. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures IC3 and IC4) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period.

The above findings show that the total financial savings play a positive and significant role in increasing the volume of credit that the banks extend to the private sector (proxy for investments) in Ivory Coast. These results clearly support the second part of the McKinnon-Shaw hypothesis. We now test for the effects of interest rate liberalisation on the economic growth in the Ivorian economy.

As in all the above cases, the stationarity tests of the relevant variables indicate that the economic growth model can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Ivory Coast. The calculated F-statistics F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR) = 4.289 at an optimum lag of 4. This is higher than the upper bound critical value of 3.76 at 5% significant level (Table IC13).

Table IC13: Modelling of Economic Growth Function - Bounds F-test for co-integration.

Dependent variable	Function				F-test statistics	
LnY = LnRGDP	F_{LnRGDP} (LnRGDP| LnL, LnK, FDI, LnCPS, FLIR)				4.289**	
Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.50	4.63	2.81	3.76	2.49	3.38

Note: ** denotes statistical significant at the 5% level.

From Table IC13, it can be seen that the null hypothesis of non-existence of co-integration among the variables is rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real GDP per capita in Ivory Coast. The AIC based ARDL (3, 3, 3, 3, 1, 3) model was selected because it has a lower mean prediction errors as well as a lower estimated standard error than the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table IC14 below.

Table IC14: Modelling of Economic Growth Function - Results of ARDL (3, 3, 3, 3, 1, 3) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	33.19	2.06	16.11	0.000
LnK	0.11	0.03	3.52	0.003
LnL	-7.58	0.56	-13.47	0.000
FDI	0.06	0.01	4.18	0.001

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
LnCPS	0.08	0.01	6.33	0.000
FLIR	0.04	0.01	6.57	0.000

Notes: Dependent variable: LnRGDP = LnY

The long run results reported in Table IC14 show that the interest rate liberalisation has a positive long run effect on the economic growth in Ivory Coast. The coefficient of the interest rate liberalisation index is positive, as expected, as well as statistically significant at 1% level. This suggest that 1% increase in the interest rate liberalisation index, a proxy for policy changes, leads to an increase of about 0.04% in economic growth. Which means the interest rate liberalisation it has a positive impact on the Ivorian economy. In fact, all the other variables included in the model, Labour (LnL), Capital Stock (LnK) and Foreign Direct Investments (FDI) are statistically significant. This supports previous studies [e.g. Roubini and Sala-i-Martin (1992) and Charlier and Ogun (2002), to mention a few] which found long run relationship between economic growth and interest rate liberalisation. It is also observed that the coefficient of the labour factor (LnL) has a negative sign contrary to expectation. Thus, a 1% increase in the labour factor leads to about 7.6% reduction in economic growth. This relationship may indicate the growing unemployment problem and the low productivity of labour in the country resulting from political instability, economic meltdown and civil wars. The short run dynamics of the model are shown in Table IC15.

Table IC15: Modelling of Economic Growth Function - Results of ARDL (3, 3, 3, 3, 1, 3) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	0.25	0.16	1.52	0.145
$\Delta LnRGDP_{-3}$	0.23	0.22	1.02	0.318
ΔLnK_{-1}	0.06	0.02	2.47	0.023
ΔLnK_{-2}	-0.10	0.05	-1.97	0.062
ΔLnK_{-3}	-0.10	0.04	-2.32	0.031
ΔLnL_{-1}	-6.27	0.87	-7.19	0.000
ΔLnL_{-2}	2.11	0.95	2.22	0.038
ΔLnL_{-3}	2.06	1.23	1.67	0.110
ΔFDI_{-1}	0.01	0.01	0.85	0.403
ΔFDI_{-2}	-0.03	0.01	-3.24	0.004
ΔFDI_{-3}	-0.01	0.01	-1.82	0.068
$\Delta LnCPS_{-1}$	0.04	0.02	-1.42	0.170
$\Delta FLIR_{-1}$	0.01	0.01	1.16	0.261
$\Delta FLIR_{-1}$	-0.03	0.01	-2.95	0.008
$\Delta FLIR_{-1}$	-0.04	0.01	-2.41	0.026
ecm(-1)	-0.92	0.19	-4.80	0.000

R-Squared	0.941	R-Bar-Squared		0.858
S.E. of Regression	0.016	F-Stat. F(16,20)		14.932[0.000]
Residual Sum of Square	0.004	DW-statistic		1.667
Akaike Info. Criterion	95.568	Schwarz Bayesian Criterion		77.848

Notes: Dependent variable: $\Delta LnRGDP_{-1} = \Delta LnY_{-1}$

Table IC15 reports the short run dynamics of the relationship between interest rate liberalisation and economic growth in Ivory Coast. The coefficient of ECM(-1) is -0.92 and statistically significant at 1% level as well as having the expected negative sign. This implies that the disequilibrium occurring due to a shock to economic growth is totally corrected in about 1 year 1 month at a rate of about 92.0% per annum. This confirms that there is a long run relationship between interest rate liberalisation and economic growth in Ivory Coast. The ECM results however, show that a change in Labour is also associated with a negative change in economic growth ($\Delta LnRGDP_{-1}$) and is very significant at 1% level. Also, the coefficient of ΔLnK_{-1} shows that change in the capital stock is positively associated with a positive change in economic

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growth. Furthermore, the coefficient of the change in the foreign direct investments (ΔFDI_{-1}) is positive but statistically insignificant.

Table IC16: Modelling of Economic Growth Function - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	1.731[0.188]
Functional Form: CHSQ(1)	11.396[0.001]
Normality: CHSQ(2)	1.432[0.489]
Hetroscedasticity: CHSQ(1)	0.224[0.636]

The regression for the underlying ARDL model fits very well at R square = 99.8% and also passes the diagnostic tests against serial correlation, normality and hetroscedasticity bar the functional form, which fails at 1% significant level as shown in Table IC16. Also, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures IC5 and IC6) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. The thesis now turns its attention to the effect of capital account liberalisation on economic growth in Ivory Coast.

8.4.3 Testing for the effects of capital account liberalisation on economic growth in Ivory Coast.

The unit root tests from the relevant variables indicate that equations (7.5) to (7.8) (all economic growth models) can be implemented as an ARDL model using bounds testing approach as in Pesaran et al. (2001) for Ivory Coast. Table IC17 shows the results and outcome of the calculated F-statistics of joint significance when real GDP per capita is normalised in the ARDL equations (7.5) to (7.8). It indicates that, in all the equations when the variable of interest, the real GDP per capita (LRGDP), is normalised, we can be rejected the null hypothesis. This implies that there is long run co-integration relationship among the variables in all the equations in Ivory Coast. The optimum lag used in establishing the co-integration in all the equations is 3. Once again, as in all the above models, in determining the optimum lag, the thesis first estimates the ARDL models,

then uses AIC or SBC to select the optimum lag. The AIC based models were selected because the estimated standard errors obtained using the AIC based models are smaller or are the same as those of the SBC based models (Pesaran and Pesaran, 2009). The credit to the private sector (CPS) and trade openness (TO) variables were excluded from all the equations because the sample size was too small. The long run results of the remaining selected models are reported in Tables IC18 to IC21 below.

Table IC17: Bounds F-test for co-integration for all the economic growth models.

Dependent variable	Functions				F-test statistics	
LnY = LnRGDP	F_{LnY} (LnY| FDI, LnMC, FLCA)				5.178**	
	F_{LnY} (LnY| FDI, LnVT, FLCA)				6.770***	
	F_{LnY} (LnY| FDI, LnTR, FLCA)				8.351***	
	F_{LnY} (LnY| FDI, LnSMDIND, LnINFL)				6.197***	
Asymptotic Critical Values						
Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	4.30	5.23	3.38	4.23	2.97	3.74

Note: ** and *** denote statistical significant at the 5% and 1% levels respectively.

Table IC18: Economic Growth and Market Capitalisation - Results of ARDL (1, 2, 0, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	0.65	0.00	22.63	0.000
FDI	0.08	0.01	6.95	0.000
LnMC	-0.03	0.02	-1.63	0.132
FLCA	-0.15	0.02	-6.16	0.000

Notes: Dependent variable: LnY = LnRGDP

Table IC19: Economic Growth and Value of Stock Traded - Results of ARDL (1, 2, 0, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.

	0.64	0.00	19.91	0.000
C	0.64	0.00	19.91	0.000
FDI	0.08	0.01	6.54	0.000
LnVT	-0.01	0.01	-1.52	0.157
FLCA	-0.16	0.02	-6.91	0.000

Notes: Dependent variable: LnY = LnRGDP

Table IC20: Economic Growth and Stock Turnover - Results of ARDL (2, 2, 0, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	0.64	0.00	21.26	0.000
FDI	0.08	0.01	6.33	0.000
LnTR	0.01	0.01	0.49	0.633
FLCA	-0.17	0.02	-7.41	0.000

Notes: Dependent variable: LnY = LnRGDP

Table IC21: Economic Growth and Stock Market Developments - Results of ARDL (2, 0, 0, 1) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	6.15	0.22	27.40	0.000
FDI	0.03	0.05	0.48	0.642
LnSMDIND	-0.04	0.11	-0.34	0.743
LnINFL	3.18	2.39	1.33	0.208

Notes: Dependent variable: LnY = LnRGDP

Table IC18 shows that the coefficient of Market Capitalisation (LnMC) has a statistically, insignificant negative effect on economic growth (LnRGDP) in the long run. It also indicates that the coefficient of (FLCA) has the unexpected sign but is statistically significant at 1% level. This may suggest that in the long run a 1% increase in the capital account liberalisation index leads to a reduction of about 0.15% in economic growth in Ivory Coast. On the other hand, the coefficient of the foreign direct investments has the expected sign and is also statistically significant at 1% level. Thus, 1% increase in foreign direct investments has about 0.08% positive effects on economic growth.

In Table IC19, the coefficient value of stock traded (LnVT) has a statistically insignificant negative effect on economic growth (LnRGDP) in the long run. The Table also indicates that the coefficient of (FLCA) has the unexpected sign as in Table IC18, but is statistically important. In addition, the coefficient of the FDI is positive, as expected, and statistically important as well.

Looking at Table IC20, the coefficient of stock turnover (LnTR) has a statistically insignificant positive effect on economic growth (LnRGDP) in the long run. It also indicates that the coefficient of (FLCA) once more has the unexpected sign but is statistically significant at 1% level. As in Tables IC18 and IC19, the coefficient of foreign direct investment (FDI) is positive and statistically important.

Table IC21 shows that the combined index of the three proxies of stock market development (LnSMDIND) has a statistically insignificant and it has unexpected negative effect on economic growth (LnRGDP). It also shows that the coefficient of inflation is positive, contrary to expectation, but is statistically insignificant. The above findings may suggest that it is rather foreign direct investment which influences economic growth in Ivory Coast and not capital account liberalisation. The results of the short run dynamic coefficient emanating from the long run relationships are shown in Tables IC22 to IC25.

Table IC22: Economic Growth and Market capitalisation - Results of ARDL (1, 2, 0, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔFDI_{-1}	0.01	0.00	2.49	0.027
ΔFDI_{-2}	-0.01	0.00	-3.10	0.008
$\Delta LnMC_{-1}$	-0.01	0.01	-1.444	0.172
$\Delta FLCA_{-1}$	0.03	0.03	0.763	0.459
$Ecm(-1)$	-0.50	0.07	-7.035	0.000
R-Squared	0.920	R-Bar-Squared	0.868	
S.E. of Regression	0.011	F-Stat. F(5,13)	25.009[0.000]	
Residual Sum of Squares	0.001	DW-statistic	2.247	
Akaike Info. Criterion	56.825	Schwarz Bayesian Criterion	53.047	

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table IC23: Economic Growth and Value of Stock Traded - Results of ARDL (1, 2, 0, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔFDI_{-1}	0.01	0.00	2.53	0.025
ΔFDI_{-1}	-0.01	0.00	-2.82	0.014
$\Delta LnVT_{-1}$	-0.01	0.00	-1.46	0.168
$\Delta FLCA_{-1}$	0.03	0.03	0.97	0.351
$Ecm(-1)$	-0.46	0.58	-7.92	0.000
R-Squared	0.919	R-Bar-Squared		0.868
S.E. of Regression	0.011	F-Stat. F(5,13)		25.095[0.000]
Residual Sum of Squares	0.001	DW-statistic		2.117
Akaike Info. Criterion	56.855	Schwarz Bayesian Criterion		53.077

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table IC24: Economic Growth and Stock Turnover - Results of ARDL (2, 2, 0, 1) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnGDP_{-2}$	-0.25	0.22	-1.10	0.291
ΔFDI_{-1}	0.01	0.00	2.16	0.052
ΔFDI_{-2}	-0.01	0.00	-2.71	0.019
$\Delta LnTR_{-1}$	0.00	0.01	0.49	0.634
$\Delta FLCA_{-1}$	0.06	0.05	1.14	0.278
$Ecm(-1)$	-0.48	0.07	-6.75	0.000
R-Squared	0.915	R-Bar-Squared		0.846
S.E. of Regression	0.011	F-Stat. F(6,12)		17.816[0.000]
Residual Sum of Squares	0.001	DW-statistic		1.714
Akaike Info. Criterion	55.289	Schwarz Bayesian Criterion		51.039

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

Table IC25: Economic Growth and Stock Market Developments - Results of ARDL (2, 0, 0, 2) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta LnRGDP_{-2}$	0.51	0.20	2.54	0.025
ΔFDI_{-1}	0.00	0.00	0.56	0.584
$\Delta LnSMDIND_{-1}$	-0.00	0.01	-0.32	0.750
$\Delta LnINFL_{-1}$	0.05	0.03	0.58	0.573
Ecm (-1)	-0.10	0.06	-1.60	0.135
R-Squared	0.752	R-Bar-Squared		0.6286
S.E. of Regression	0.018	F-Stat. F(5,15)		4.293[0.002]
Residual Sum of Squares	0.004	DW-statistic		2.265
Akaike Info. Criterion	47.192	Schwarz Bayesian Criterion		43.887

Notes: Dependent variable: $\Delta LnY_{-1} = \Delta LnRGDP_{-1}$

As can be seen from Table IC22, only the coefficients of the changes in the foreign direct investment (FDI) variable are statistically significant. This implies that foreign direct investments have statistically both short and long run impacts on economic growth in Ivory Coast. The coefficient of the changes in LnMC has sign contrary to a priori expectation and is statistically not important. The coefficient of ECM(-1) is -0.50. This is statistically significant at 1% level and may suggest that any shock is corrected in about 2 years exactly at 50.0% per annum.

As in Table IC23, only the coefficients of the changes in the foreign direct investment (FDI) variable are statistically significant. The coefficient of the changes in LnVT has sign contrary to a priori expectation but is statistically not important. The coefficient of ECM(-1) is -0.46. This is statistically significant at 1% level and may suggest that any shock is corrected in about 2 years and 2 months at 46.0% per annum. Furthermore, in Table IC24, only the coefficients of the changes in the foreign direct investment (FDI) variable are statistically significant. The coefficient of the changes in LnTR has the expected sign but is statistically not important. The coefficient of ECM(-1) is -0.48. This is statistically significant at 1% level and may suggest that any shock is corrected in about 2 years and 1 month at 48.0% per annum

Finally, in Table IC25, only the coefficient of the change in the lag of real GDP per capita variable is statistically significant. The coefficients of the changes in LnSMDIND and LnINFL have signs contrary to a priori expectation. The coefficient ECM(-1) is found to be small in magnitude and has the expected negative sign but is statistically insignificant.

Table IC26: Economic Growth and Market capitalisation - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.565[0.452]
Functional Form: CHSQ(1)	0.875[0.350]
Normality: CHSQ(2)	0.334[0.846]
Hetroscedasticity: CHSQ(1)	1.479[0.224]

Table IC27: Economic Growth and Value of Stock Traded - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.146[0.703]
Functional Form: CHSQ(1)	0.355[0.313]
Normality: CHSQ(2)	0.129[0.524]
Hetroscedasticity: CHSQ(1)	1.201[0.273]

Table IC28: Economic Growth and Stock Turnover - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.124[0.725]
Functional Form: CHSQ(1)	0.082[0.774]
Normality: CHSQ(2)	0.840[0.657]
Hetroscedasticity: CHSQ(1)	5.069[0.024]

Table IC29: Economic Growth and Stock Market Developments - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.774[0.196]
Functional Form: CHSQ(1)	0.011[0.917]
Normality: CHSQ(2)	1.938[0.379]

LM Test Statistics	Results
Hetroscedasticity: CHSQ(1)	1.183[0.277]

The regressions for the underlying ARDL models fit very well at R square = 98.7% for equations (7.5) to (7.7) and 96.2% for equation (7.8). Also, equations (7.5), (7.6) and (7.8) pass all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity, as shown in Tables IC26, IC27 and IC29. However, equations (7.7) pass three of the diagnostic tests but fail the test against hetroscedascticity at 5% significant level, as shown in Table IC28. Once more, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (Figures IC7 to IC14) from the recursive estimation of the model reveals that there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period. Lastly, this sub-section of the thesis looks at the combined effect of interest rates and capital account liberalisation on economic growth in Ivory Coast.

8.4.4 Testing for the effects of both interest rate and capital account liberalisation on economic growth in Ivory Coast

Once again, the results from the stationarity tests of the relevant variables indicate that equation (7.9) – the long run economic growth model - can be implemented as an ARDL model for Ivory Coast using bounds testing approach as in Pesaran et al. (2001). The calculated F-statistics F_{LnRGDP} (LnRGDP| LnK, LnL, FDI, LnGEXP, LnRXR, LnINFL, FLBL) = 3.934 at optimum lag of 1. This is higher than the upper bound critical value of 3.50 at the 5% significant level (Table IC30).

Table IC30: Economic Growth and Financial Liberalisation - Bounds F-test for co-integration.

Dependent variable	Function	F-test statistics
LnY = LnRGDP	F_{LnY} (LnY| LnL, LnK, FDI, LnGEXP, LnRXR, LnINFL, FLBL)	3.934**
Asymptotic Critical Values		

Pesaran et al. (2001), p.301, Table CI(iv) Case IV	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(0)
	3.07	4.23	2.50	3.50	2.22	3.17

Note: ** denotes statistical significant at the 5% level.

From the above results, the null hypothesis of non-existence of co-integration among the variables is rejected. This implies that there is a long run co-integration relationship amongst the variables when the model is normalised on real GDP per capita (LnRGDP) in Ivory Coast. The thesis estimates the ARDL model then uses AIC or SBC to select the optimum lag. The AIC based ARDL (1, 1, 1, 1, 0, 0, 1, 0) model was selected as it has the same mean prediction errors as well as a lower estimated standard error as that of the SBC based model (Shrestha and Chowdhury, 2007). The long run results of the selected model are reported in Table IC31 below.

Table IC31: Economic Growth and Financial Liberalisation - Results of ARDL (1, 1, 1, 1, 0, 0, 1, 0) long run model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
C	28.67	4.70	6.10	0.000
LnK	0.05	0.05	1.10	0.283
LnL	-5.97	1.35	-4.43	0.000
FDI	0.05	0.03	1.84	0.077
LnGEXP	-0.07	0.10	-0.69	0.496
LnRXR	-0.18	0.10	-1.70	0.102
LnINFL	0.25	0.27	0.94	0.354
FLBL	0.01	0.01	1.09	0.287

Notes: Dependent variable: LnY = LnRGDP

Table IC31 shows that the coefficient of the real government expenditure (LnGEXP) is statistically insignificant but it has the expected a priori sign. The coefficient of inflation (LnINFL) and that of the real export revenue (LnRXR) are both statistically insignificant but have unexpected signs. Furthermore, the coefficient of the combined financial liberalisation index (FLBL), which serves as the proxy of changes and implementation of the policy has a

positive sign, as expected, but is statistically insignificant. The coefficient of foreign direct investments (FDI) has the expected positive sign and it is also statistically significant at 10% level. Thus, a 1% increase in foreign direct investments leads to an increase of about 0.05% in economic growth in the long run. The coefficient of real export revenue (LnRXR) has the unexpected negative sign and it is statistically insignificant. However, the negative relationship between real export and economic growth may suggest the existence of "immiserizing growth" effect (Bhagwati, 1958) in the Ivorian Economy[57]. Also the negative relationship between the labour factor and economic growth may suggest that a 1% increase in the labour force will lead to a reduction of about 5.97% in economic growth. As in Ghana, this relationship may indicate the growing unemployment problem and the low productivity of labour in the country resulting from political instability, economic meltdown and civil wars.

Another interesting finding is the insignificant relationship between financial liberalisation and economic growth in the long run. This may suggest that for Ivory Coast, the effect of financial liberalisation is non-existent. Like in Ghana, this may be due to the fact that, as Ivory Coast is a primary commodity exporter, export revenue contributions significantly to economic growth than financial policies. The effect is that the impact of financial liberalisation policies is somehow obscured in the economic growth process in Ivory Coast. Also, one other reason may be the underdeveloped nature of the financial sector in Ivory Coast. The short run dynamics of the model are shown in Table IC32.

Table IC32: Economic Growth and Financial Liberalisation - Results of ARDL (1, 1, 1, 1, 0, 0, 1, 0) ECM model selected on AIC.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
ΔLnK_{-1}	0.07	0.02	3.37	0.002
ΔLnL_{-1}	-4.51	0.60	-7.54	0.000
ΔFDI_{-1}	0.00	0.01	0.78	0.440
$\Delta LnGEXP_{-1}$	-0.02	0.03	-0.70	0.491
$\Delta LnRXR_{-1}$	-0.05	0.03	-1.88	0.069
$\Delta LnINFL_{-1}$	-0.01	0.06	-2.29	0.029

[57]Note that Ivory Coast is the largest exporter of cocoa bean whilst Ghana is the second largest exporter.

Regressor	Co-efficient	Standard Error	T-Ratio	Prob.
$\Delta FLBL_{-1}$	0.00	0.00	1.07	0.291
Ecm (-1)	-0.28	0.0605	-4.63	0.000

R-Squared	0.905	R-Bar-Squared	0.862
S.E. of Regression	0.016	F-Stat. F(8, 30)	31.125[0.000]
Residual Sum of Squares	0.007	DW-statistic	2.163
Akaike Info. Criterion	100.493	Schwarz Bayesian Criterion	89.680

Notes: Dependent variable: $\Delta LnY = \Delta LnRGDP$

The coefficients of ΔLnL_{-1}, ΔLnK_{-1}, $\Delta LnRXR_{-1}$ and $\Delta LnINFL_{-1}$ are all statistically significant. On the other hand, the coefficients of ΔFDI_{-1}, $\Delta LnGXEP_{-1}$ and $\Delta FLBL_{-1}$ are all statistically insignificant. The coefficient of ECM(-1) is found to be statistically significant at 1% level with the expected negative sign. This confirms the existence of a long run relationship between the variables. The coefficient of ECM(-1) term is -0.28, which suggests a relative slow rate of adjustment process. The magnitude of the coefficient of the ECM(-1) implies that the disequilibrium occurring due to a shock is totally corrected in about 3 years and 7 months at a rate of 28.0% per annum.

The regression for the underlying ARDL model fits very well at R square = 99.67% and also passes all the diagnostic tests against serial correlation, functional form, normality and hetroscedasticity as shown in Table IC33. Furthermore, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (see Figures IC15 and IC16) from the recursive estimation of the model reveals there is stability and there is no systematic change detected in the coefficient at 5% significant level over the sample period.

Table IC33: Economic Growth and Financial Liberalisation - ARDL-VECM model diagnostic tests.

LM Test Statistics	Results
Serial Correlation: CHSQ(1)	0.447[0.504]
Functional Form: CHSQ(1)	0.024[0.878]
Normality: CHSQ(2)	0.111[0.961]
Hetroscedasticity: CHSQ(1)	1.073[0.300]

Chapter Nine

Conclusion and Policy Implications

9.1   Introduction

In this chapter the thesis presents summaries of findings and conclusions as well as some policy implications based on the findings and outcome of the preceding analysis in the context of the economic conditions in each of the selected countries. The main objective of this thesis is to empirically examine and investigate comprehensively, the impact of financial liberalisation; both interest rate and capital account liberalisation policies on economic growth using three ECOWAS countries (i.e. Ghana, Nigeria and Ivory Coast) as case studies.

The thesis employs the ARDL bounds testing approach and unrestricted error correction model (UECM) to co-integration analysis popularised by Pesaran et al. (2001) to establish the long run relationship between the relevant time series variables. It also applies a multi-dimensional financial liberalisation indices constructed from a number of financial liberalisation policy measures implemented as a result of the financial liberalisation process in the selected countries. One proviso that should be taken into consideration is that it has been recognised by many economists that co-integration techniques may not be appropriate when the sample size is too small (Narayan and Smyth, 2005). This in particular, will be the case of the capital account liberalisation in the most of the above analysis.

The thesis contributes to the growing literature on financial liberalisation. Additionally, the thesis provides insight into the impact of financial liberalisation policy in three ECOWAS countries. The thesis also contributes to the scarce and sometimes non-existence of literature on the implementation of the financial liberalisation policies in ECOWAS countries. In the next section, the thesis presents the summary of the study.

9.2   Summary of the study

The results mostly supports McKinnon-Shaw hypothesis in the selected ECOWAS countries. The findings also in parts support the capital account liberalisation hypothesis. However, the effect of financial liberalisation on economic growth was non-existence apart from one of the selected countries.

The empirical findings mostly contradict the conclusions reached by a number of past studies which failed to support the positive interest rate effect of financial liberalisation on savings and investment. Some of the studies that have reported the interest rate effects on savings and investment to be either inconclusive or negative are Bhatia and Khatkhate (1975), Fry (1988), Paul and Dutt (1991), Bayoumi (1993), Morriset (1993), Bascom (1994), Bandiera et al. (2000), Loayza et al. (2000), Reinhart and Tokatlidis (2001), Deidda and Fattouh (2002), Schmidt-Hebbel and Serven (2002) and Hermes and Lensink (2005), just to mention a few. The empirical evidence from the analysis in chapter eight are therefore in line with the findings of the World Bank (1987), Roubini and Sala-i-Martin (1992), De Gregorio and Guidotti (1995), Ghatak (1997) Odhiambo (2009b), Odhiambo (2009c) and Shrestha and Chowdhury (2007), which found in favour of the positive effects of interest rate liberalisation and report that interest rates liberalisation leads to more savings, which ultimately leads to increase in investment.

The empirical evidence also shows that interest rate liberalisation has led to increase in savings and hence investments, and these have been transmitted into the real economy to impact on economic growth and prosperity in two of the selected countries. This may suggest that in the selected ECOWAS countries, the impact of interest rate liberalisation policies is significant and therefore the policies do lead to or do have impact on economic growth in the long run.

The findings may also suggest that stock market developments and capital account liberalisation policies have little or insignificant impact on economic growth and prosperity in some of the selected countries. Rather, the results show that it is credit to the private sector and foreign direct

investments together with capital account liberalisation policy changes (in parts) that influence economic growth in all the selected countries.

Interestingly, the results show that financial liberalisation policies, both interest rate and capital account, and exports are not the main drivers of economic growth in the selected ECOWAS countries but rather factors like increase in foreign direct investments, increase in labour productivity, increase in capital stock accumulation, government expenditure and credit to the private sector. The summary of the empirical findings for the selected countries are presented in the next section.

9.3   Summary of the empirical findings

The unit root tests employed suggest that all the variables were found to be either I(0) or I(1) stationary in all the selected countries. Also, all the relevant dependent variables were found to be co-integrated with the respective relevant independent variables. This means that long run relationships between the variables of interest were established.

The results indicate that the real deposit rate plays a positive and significant role in increasing the total financial savings in Ghana and Nigeria, but in Ivory Coast it is rather bank proliferation which plays a positive and significant role in increasing the total financial savings. This implies that the results in Ghana and Nigeria support the first part of the McKinnon-Shaw hypothesis. Also, in all the countries, the evidence reveals that the total financial savings play a positive and significant role in increasing the volume of credit that the banks extend to the private sector (proxy for investments). Hence, the results support the second part of the McKinnon-Shaw hypothesis. In Ghana, the results partially support the McKinnon-Shaw hypothesis, i.e. in the long run interest rate liberalisation will ultimately lead to rapid economic growth. However, in Nigeria and Ivory Coast the results support the McKinnon-Shaw hypothesis, i.e. in the long run interest rate liberalisation will ultimately lead to rapid economic growth. The evidence further shows that in Ghana, the interest rate liberalisation policy has led to increase in financial savings and credit to the private sector, but these outcomes have not been fed into economic growth or prosperity. For example, financial savings as a percentage of GDP increase on the average from

24.6% pre the policy to 35.7% post the policy, and this led to increase in the amount of credit extended to the banks, but the indicator for the policy shows no impact on economic growth. One possible reason for this could be the developing nature of the financial sector and its institutions. On the other hand, in Nigeria and Ivory Coast, the effect of interest rate liberalisation policies on economic growth is significant and positive.

Regarding the relationship between stock market developments and economic growth, the results suggest that individually, the proxies of stock market development have insignificant effect on the economic growth in Ghana. Even combining them has no effect on economic growth. It is rather increase in credit to the private sector by the banks and not capital account liberalisation policies that have positive effect on economic growth. In Nigeria, however, the results suggest that individually, two of the proxies of stock market development have insignificant effect on the economic growth and only one has any impact at all on economic growth and even combining the three proxies has no impact on economic growth. In Ivory Coast, the results suggest that individually, none of the proxies of stock market development have insignificant effect on the economic growth. Additionally, combining them has no impact at all on economic growth. But rather foreign direct investments together with capital account liberalisation policies affect economic growth. One interesting findings is that in Nigeria, the empirical evidence suggests that increase in credit to the private sector by the banks have a mostly negative effect on economic growth. Also in Ivory Coast and Ghana, the results reveal that most the stock market development proxies and capital account liberalisation policies have either negative effect on economic growth or have statistically negligible effect on economic growth.

In all three countries, the overall empirical findings show that the effects of financial liberalisation policies on economic growth are positive in the short run and partially positive in the long run. The empirical findings also show that in all three countries, it is rather a combination of increase in labour productivity, increase in the accumulation of capital stock, increase in government expenditure and increase in foreign direct investments as well as credit to the private sector, in the cases of Ghana and Ivory Coast, which are the main drivers of economic growth, and also in some parts the implementation of financial liberalisation policies or improvement in the financial sector.

One interesting empirical findings is the fact that in all the selected countries, the effects of export on economic growth was found to be negative. This finding is very significant as all the countries are mainly primary commodity exporters. This result may suggest the existence and the effect of immiserizing growth in the selected countries. The above summary of the empirical findings have significant policy implications and these are presented in the next section.

9.4   Conclusion and Policy Implications

The first significant policy implication arising out of the empirical finding in the thesis is that the savings and investment can be facilitated by maintaining higher real interest rates. Thus, further deregulation or liberalisation of interest rates is advocated for generating higher savings and investment in the selected countries. However, the authorities should guide the interest rates by setting the margins and allowing the market to find the actual rates within the margins. It should be noted however, that setting the margins in this way is not the same as setting the ceiling. Here, the thesis proposes that the policy makers should allow the market to determine the interest rates first, then the relevant policies are put in place to guard the determined interest rates by setting margins for it.

Secondly, the banks should be encouraged to extend more credit to the private sector. But the financial sector in conjunction with the government should educate the business community about the need to invest such credits in productive ventures that will influence rapid economic growth in the long run. This will require developing and empowering of the relevant institutions. As pointed out by Prasad and Rajan (2008) a successful implementation of financial policy depends on the level of institutional and economic development before the policy is implemented (see also Faria and Mauro, 2004).

Thirdly, to influence sustainable and rapid economic growth and prosperity, policy makers in the selected countries should put in place implementable policies in an attempt to diversify their exports and improve the productivity of labour by partly or wholly processing (i.e. to include manufacturing as part of the diversification drive) their export commodities. This will lead to

higher export revenue which will filter into the non-export sector as well as increasing the productivity of labour and hence avoiding the effects of immiserizing growth. Also, one possible impact could be the natural resource curse (see Frankel, 2010)

Furthermore, it appears that reforms or liberalisation of the stock markets alone cannot induce economic growth. The findings may suggest that it is the combination of good performing stock markets, increased in private investment, increased in government expenditures and increase in foreign direct investment into the real economy rather than commerce (buying and selling) that will induce economic growth and prosperity.

Also, policy makers in the selected ECOWAS countries should ensure that stock markets, where they exist, are developed such that they are incorporated into the financial sector and the economy as a whole. The results indicate that the level of integration of the stock markets into the economy in the selected countries is weak. As pointed out by Adjasi and Biekpe (2006), the efficiency and productivity effects of stock market on economic growth are strong and positive when stock markets are liquid and active.

Additionally, as indicated in the results, the governments should increase their expenditure to affect economic growth whilst appropriate policies should be put in place to the development of the private sector in order to take over the bulk of the investments activities and to influence economic growth in the long run. With a teaming number of youth unemployment in the selected countries, this will go a long way to alleviate some of the problems in the short run and hence prevent social upheaval in the long run.

Finally, the empirical findings show that the financial liberalisation policies have been supportive but more needs to be done by the selected ECOWAS countries to realise its full potential effects on economic growth. These can be done by improvements in financial deepening process and by removal of the bottlenecks in the financial sectors of the respective economies. Also, there is the need to improve the effectiveness of the deliverance of credit to the private sector, efficient credit evaluation and public sector surveillance, by abiding to stringent accounting standards and implementing auditing best practices, as well as putting in

place the proper legal framework to help shape the financial deepening process. Having said all this, the thesis now looks at some of its limitations.

9.5   Limitation of the study and areas for further research

The findings in this thesis are limited to ECOWAS countries and countries which are at similar stages of development where primary exports constitute a significant portion of the gross domestic product (GDP) and stock market developments are at their infant stage. Hence, the empirical evidence may not be applicable to countries which do not fall into this category.

One other limitation could be due to the smallness of the time series data used in the empirical analysis. This may be the case, especially for the findings emanating from the capital account liberalisation. Due to this limitation, further research work would have to be carried out in the future when enough data is available to ascertain the true relationship between stock market developments and economic growth in the selected countries. Also, for future analysis to avoid this problem, panel analysis could be used instead of time series analysis.

The results from the analysis in the thesis show that in all of the three selected countries, the relationship between real export revenue and economic growth, as indicated by real GDP per capita is negative. As all the selected countries are mainly primary commodity exporters, the a priori expectation is that there is a positive relation. As explained in the analysis, there seem to be the existence of immiserizing growth effect (Bhagwati, 1958) in the selected countries. However, this requires further and detailed investigation to confirm and provide the requisite policy implication. Also, what the reported results seem to pick up is the natural resource curse in the selected countries[58]. Further research in this direction is required.

Finally, the thesis provides a comprehensive insight into the impacts of financial liberalisation policies on economic growth in three ECOWAS countries, which are mainly primary exporters. It also unearthed the fact that the effects of financial liberalisation policies on economic growth is a complex process with effects which need to be traced through various sectors of the

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[58] See Frankel (2010) for a detail exposition on this phenomenon.

economy and further research is needed in this direction. But the generalisation of the empirical results for all primary commodity exporter countries (PCECs) may be premature. This requires further studies or researches from other parts of Africa, South America and Asia as well as Middle East to ensure that the findings are consistence for all primary commodity exporters with an infant stage development of the domestic stock markets.

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Appendix I: Principal Component Analysis (PCA)

The financial liberalisation indices used in the thesis were derived using principal component analysis (PCA) as explained in section 7.3.2. The components use in the construction of the financial liberalisation indices (FLIR, FLCA and FLBL) is detailed in the Tables AG1, AN1 and AIC1 for the selected three countries respectively. Similar approach is used by Caprio et al (2000) and Laeven (2003).

Table AG1: Components for the construction of Financial Liberalisation Indices for Ghana

Variable	Indicator	Policy implemented	Year
ERP	Exchange Rate	multiple system of exchange rate established	1983
		A two-window system of determining exchange rate introduced	1986
		Unified system adopted	1987
		Small scale inter-bank market developed	1990
		Exchange rates fully liberalised	1992
RLRP	Regulatory and Legal Reforms	The Banking Law (PNDCL 225) was amended	1989
		promulgation of revised Bank of Ghana Law (PNDCL 291)	1992
		Bank of Ghana Financial Institutions (Non-Banking) Law (PNDCL 328) enacted	1993
INTRP	Institutional Restructuring	Consolidated Discount House (CDH) established	1987
		formalisation of the money market and Security Discount Company (SDC) created	1991
		mergers, liquidation and divestiture of public stakes in some of the banks	1995
CAL	Capital Account Liberalisation	Partial liberalisation of capital account	2006
DMD	Demonetisation	De-monetisation of domestic currency	1983
MCP	Monetary Control	Central Bank given independence	1992
IRP	Interest Rate	abolition of the maximum and minimum deposit rates except the minimum saving deposit rate	1987
		abolition of minimum lending rates for commercial banks	1988
		Commercial banks freed to determine their own lending rates	1989

Table AG1: Components for the construction of Financial Liberalisation Indices for Ghana

Variable	Indicator	Policy implemented	Year
		abolition of 20 per cent mandatory lending	1990
		interest rates fully liberalised	1991
CMD	Capital Market Establishment	Ghana's capital market established	1989
		Ghana Stock Exchange started operation	1990
		Foreign investors allowed participation but with restriction	1993
		restriction on foreign investors participation fully abolished	2006
SRRP	Secondary Reserve Requirement	The secondary reserve requirement for banks reduced	2006
CUB	Universal Banking	Banks permitted to expand to other sectors of the economy not specified in their licence	2006

Table AN1: Components for the construction of Financial Liberalisation Indices for Nigeria

Variable	Indicator	Policy implemented	Year
ERP	Exchange Rate	A two-window system of determining exchange rate introduced	1986
		Unified system adopted	1986
		Exchange rates fully liberalised	1988
RLRP	Regulatory and Legal Reforms	Licencing of Banks liberalised	1986
		Extension of credits to the foreign currency deposits	1989
INTRP	Institutional Restructuring	Deposit insurance established	1988
		Central bank empowered	1991
		Banking restructuring	1993
		Central bank independence	2004
CAL	Capital Account Liberalisation	Partial capital accounts liberalisation	1989
		Full capital accounts liberalisation	1992
MCP	Monetary Control	capital adequacy requirements reviewed	1989
		Risk-weighted paid up capital introduced	1990
		Credit controls abolished	1992
IRP	Interest Rate	Controls on interest rates completely removed	1986

Table AN1: Components for the construction of Financial Liberalisation Indices for Nigeria

Variable	Indicator	Policy implemented	Year
		Interest rate allowed to be paid on deposits	1989
		Controls on interest rates re-introduced	1991
		Controls on interest rates completely removed	1992
		Controls on interest rates modified	1995
		interest rate controls removed again	1997
CMD	Capital Market Establishment	Auction for Government securities started	1989
		Stabilisation to mop up excess liquidity	1990
SRRP	Secondary Reserve Requirement	The secondary reserve requirement for banks reduced	2004
CUB	Universal Banking	Banks permitted to expand to other sectors of the economy not specified in their licence	2004

Table AIC1: Components for the construction of Financial Liberalisation Indices for Ivory Coast

Variable	Indicator	Policy implemented	Year
RLRP	Regulatory and Legal Reforms	Restructuring and liquidity of banks	1990
		Constitution for regional stock exchange adopted	1996
		Banking Supervision Institute established	1990
INTRP	Institutional Restructuring	Legal framework of Regional stock exchange adopted	1996
		Central Securities Depository established	1996
CAL	Capital Account Liberalisation	Capital account liberalised	1998
MCP	Monetary Control	Controls on credit allocation abolished	1991
		Devaluation of the CFA	1994
IRP	Interest Rate	Interbank ceiling on interest rates relax	1989
		Interest rate fully liberalised	1990
		interest rate spread policy reformed	1992
CMD	Capital Market	Regional stock exchange established	1995

Table AIC1: Components for the construction of Financial Liberalisation Indices for Ivory Coast

Variable	Indicator	Policy implemented	Year
	Establishment	Ivorian Stock exchange replaced with West Africa Stock Exchange	1997
SRRP	Secondary Reserve Requirement	WAEMU abolishes preferential discount rate and relaxed reserve requirements	1990
CUB	Universal Banking	Banks permitted to expand to other sectors of the economy not specified in their licence	1990

When constructing the financial liberalisation indices, some arbitrary value between 0 and 1 are assigned to each of the financial liberalisation policy variables depending on the date of implementation. A policy leading to full liberalisation of the financial sector takes a value of 1 and a policy leading to partial liberalisation of the sector (i.e. remains regulated) takes a value of between 0 and 1 depending on the number of policies needed to make the sector fully liberalised. Thus, in order to capture the circumstances of partial and phase-wise gradual liberalisation of a particular sector, we assigned partial values equivalent π/n where n is number of phases/policies taken for the sector to be fully liberalised; $\pi = 1, 2,......., n$ represent the phase already completed. For example in a four-phased deregulation process, ¼ = 0.25 will mean the completion of first phase, 2/4 = 0.50 will indicate the completion of the second phase, ¾ = 0.75 for third phase and finally, 4/4 = 1.0 will indicate full liberalisation.

The composition of each index number for each year is expressed in the following equations:

$FLIR = k_1 ERP + k_2 RLRP + k_3 INTRP + k_4 DMD + k_5 MCP + k_6 IRP + k_7 SRRP + k_8 CUB$

$FLCA = k_1 CAL + k_2 CMD$

$FLBL = k_1 ERP + k_2 RLRP + k_3 INTRP + k_4 CAL + k_5 DMD + k_6 MCP + k_7 IRP + k_8 CMD + k_9 SRRP + k_{10} CUB$

Where k_i is the weight of each component given by the unrotated respective eigenvector of the selected principal component (see the Tables below). The eigenvectors and the eigenvalues of the correlation matrix for each of the selected country are presented in the following tables below.

The principal component (i.e. the appropriate eigenvector) to use is selected based on the largest eigenvalue.

Ghana

Table AG3: Eigenvalues and Eigenvectors for interest rate liberalisation (FLIR)

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3
ERP	0.982	-0.150	-0.081
RLRP	0.935	-0.065	-0.324
INTRP	0.952	-0.067	-0.258
DMD	0.838	-0.258	0.480
MCP	0.838	-0.258	0.480
IRP	0.947	-0.104	-0.277
SRRP	0.454	0.886	0.095
CUB	0.454	0.886	0.095
Eigenvalues	**5.462**	**1.745**	**0.733**

Table AG4: Eigenvalues and Eigenvectors for capital account liberalisation (FLCA)

Variable	Eigenvector_1	Eigenvector_2
CAL	0.979	0.206
CMD	0.979	-2.06
Eigenvalues	**1.915**	**0.085**

Table AG5: Eigenvalues and Eigenvectors for combined financial liberalisation (FLBL)

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3
ERP	0.969	-0.224	-0.021
RLRP	0.952	-0.113	-0.269
INTRP	0.959	-0.125	-0.193
CAL	0.911	0.315	-0.160
DMD	0.780	-0.356	0.514
MCP	0.780	-0.356	0.514
IRP	0.952	-0.164	-0.215
CMD	0.975	0.016	-0.192
SRRP	0.509	0.837	0.194
CUB	0.509	0.837	0.194
Eigenvalues	**7.190**	**1.860**	**0.822**

Nigeria

Table AN3: Eigenvalues and Eigenvectors for interest rate liberalisation (FLIR)

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3
ERP	0.923	-0.274	-0.209
RLRP	0.958	-0.053	-0.211
INTRP	0.369	-0.468	-0.763
MCP	0.923	-0.190	-0.259
IRP	0.760	0.020	0.301
SRRP	0.707	0.683	0.146
CUB	0.707	0.683	0.146
Eigenvalues	**5.142**	**1.401**	**0.878**

Table AN4: Eigenvalues and Eigenvectors for capital account liberalisation (FLCA)

Variable	Eigenvector_1	Eigenvector_2
CAL	0.944	-0.330
CMD	0.944	0.330
Eigenvalues	**1.782**	**0.218**

Table AN5: Eigenvalues and Eigenvectors for combined financial liberalisation (FLBL)

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3
ERP	0.936	-0.258	-0.116
RLRP	0.976	-0.034	-0.150
INTRP	0.337	-0.420	0.777
CAL	0.931	-0.284	-0.160
MCP	0.952	-0.168	-0.201
IRP	0.714	0.058	0.406
CMD	0.901	0.182	-0.187
SRRP	0.680	0.705	0.158
CUB	0.680	0.705	0.158
Eigenvalues	**6.782**	**1.510**	**0.956**

Ivory Coast

Table AIC3: Eigenvalues and Eigenvectors for interest rate liberalisation (FLIR)

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3
RLRP	0.960	-0.212	-0.005
INTRP	0.960	-0.212	-0.005
MCP	0.976	-0.175	0.030
IRP	0.976	-0.175	0.030
SRRP	0.807	0.389	0.443
CUB	0.976	-0.175	0.030
Eigenvalues	**5.954**	**0.475**	**0.222**

Table AIC4: Eigenvalues and Eigenvectors for capital account liberalisation (FLCA)

Variable	Eigenvector_1	Eigenvector_2
CAL	0.962	-0.271
CMD	0.962	0.271
Eigenvalues	**1.853**	**0.147**

Table AIC5: Eigenvalues and Eigenvectors for combined financial liberalisation (FLBL)

Variable	Eigenvector_1	Eigenvector_2	Eigenvector_3
RLRP	0.948	-0.250	-0.070
INTRP	0.948	-0.250	-0.070
CAL	0.829	0.514	-0.187
MCP	0.967	-0.208	-0.076
IRP	0.967	-0.208	-0.076
CMD	0.987	0.029	-0.860
SRRP	0.846	0.489	-0.160
CUB	0.967	-0.208	-0.076
Eigenvalues	**6.571**	**0.600**	**0.349**

Appendix II: CUSUM and CUSUMSQ Graphs

Ghana

Figure G1: Savings function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
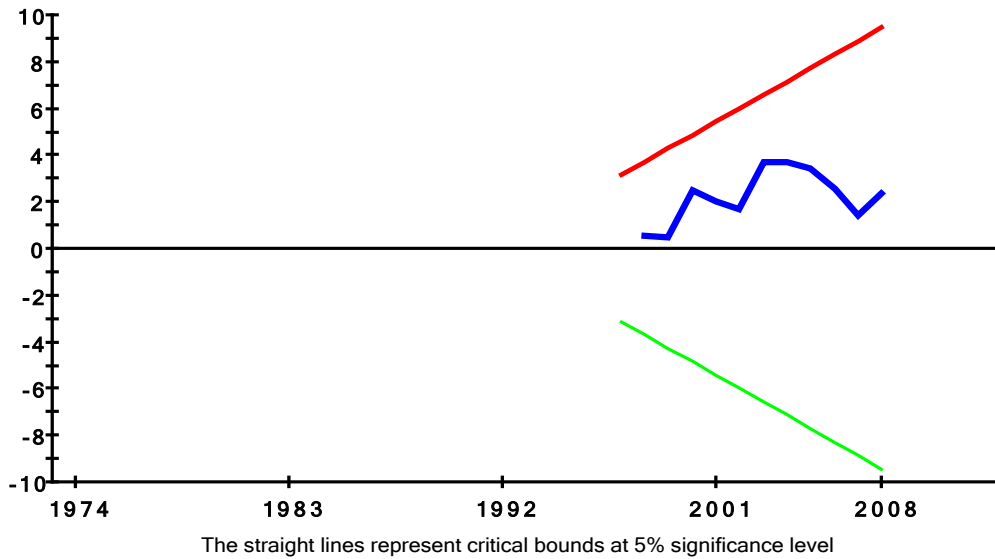
Figure G2: Savings function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
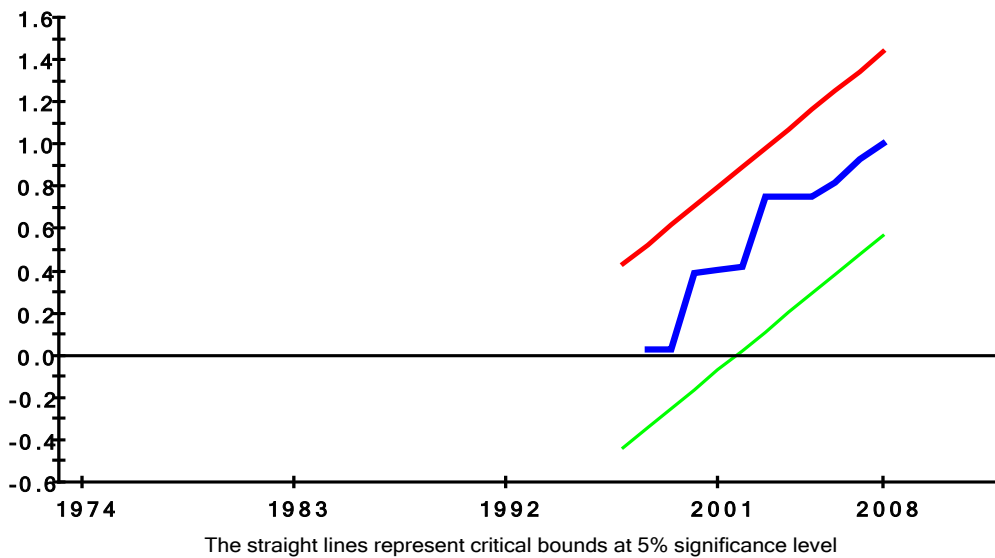
Figure G3: Investment function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
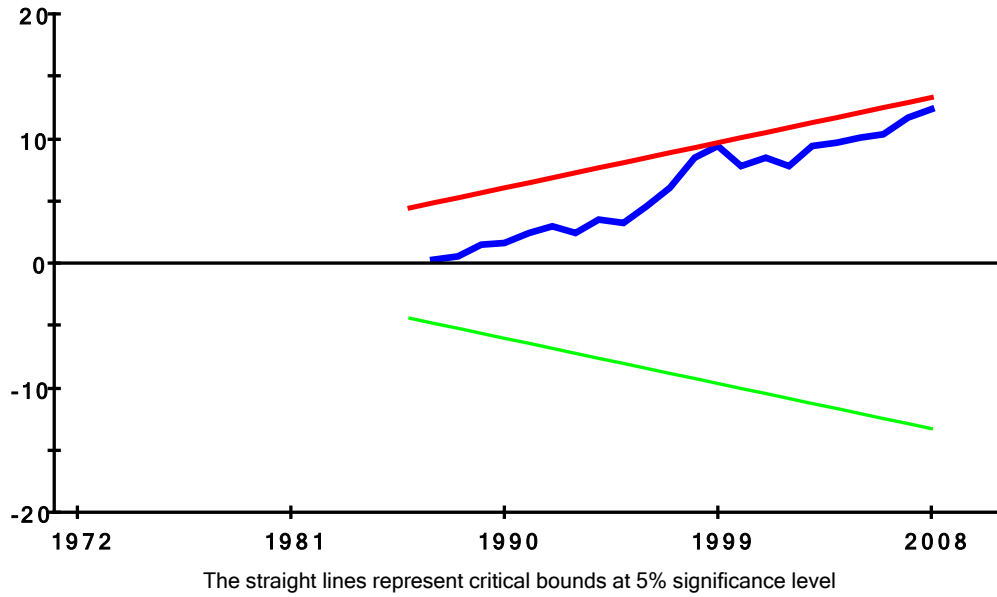
Figure

G4: Investment function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

310
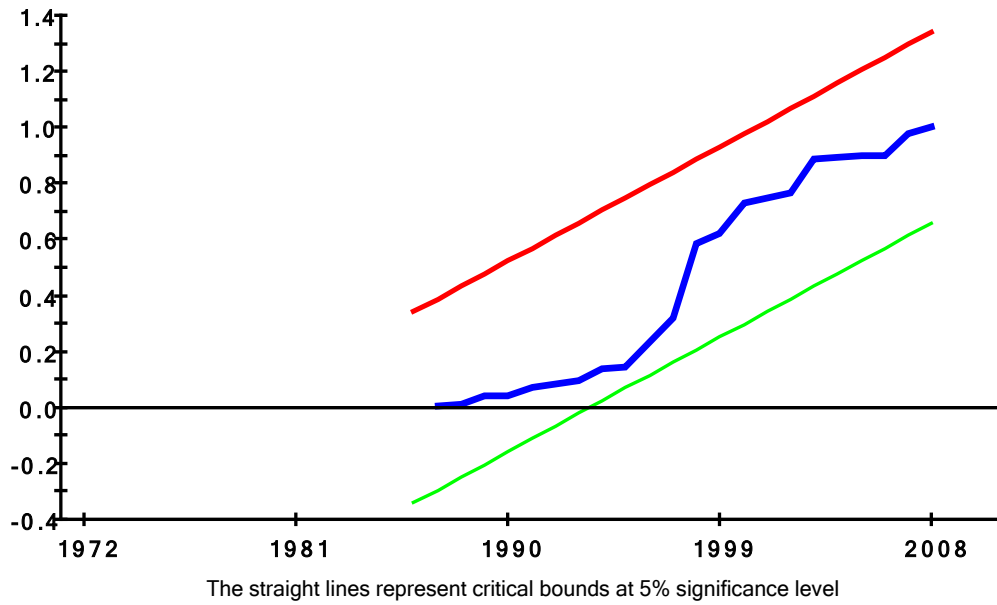
Figure G5: Economic Growth function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
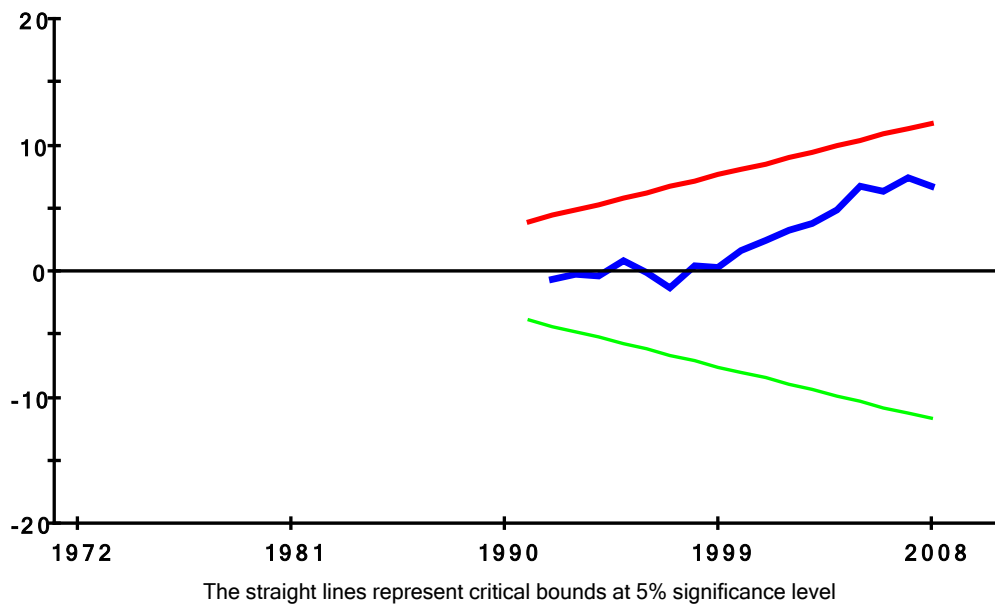
Figure G6: Economic Growth function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
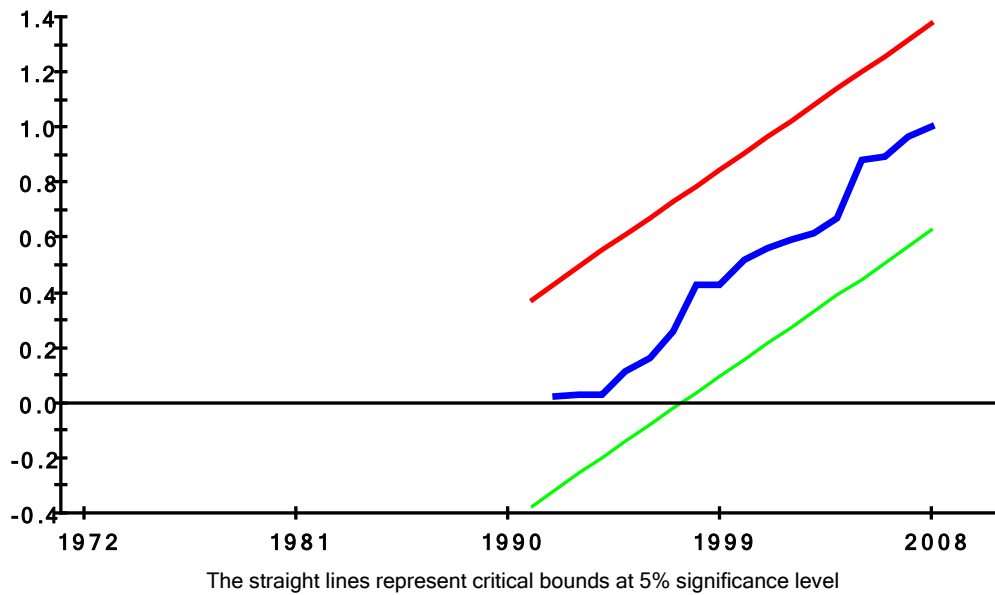
Figure G7: Economic Growth and Market Capitalisation - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
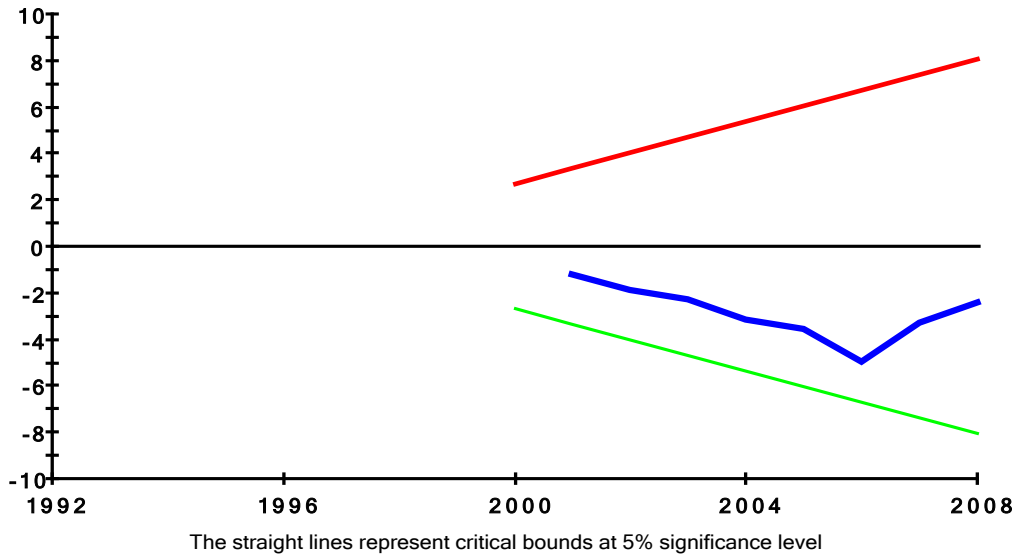
Figure

G8: Economic Growth and Market Capitalisation -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
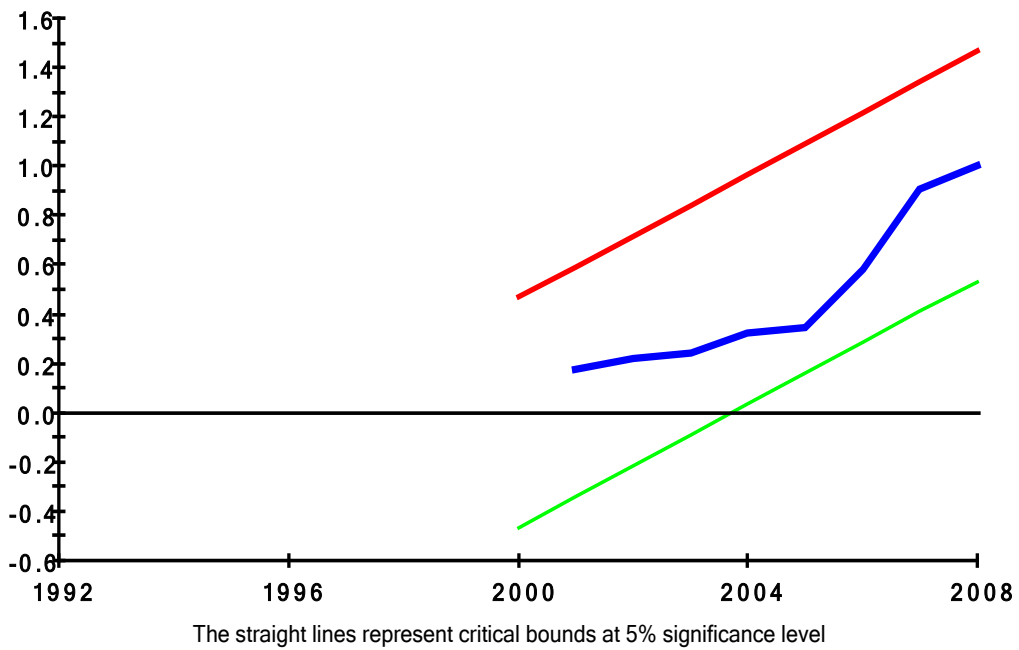
Figure G9: Economic Growth and value of Stock Traded - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
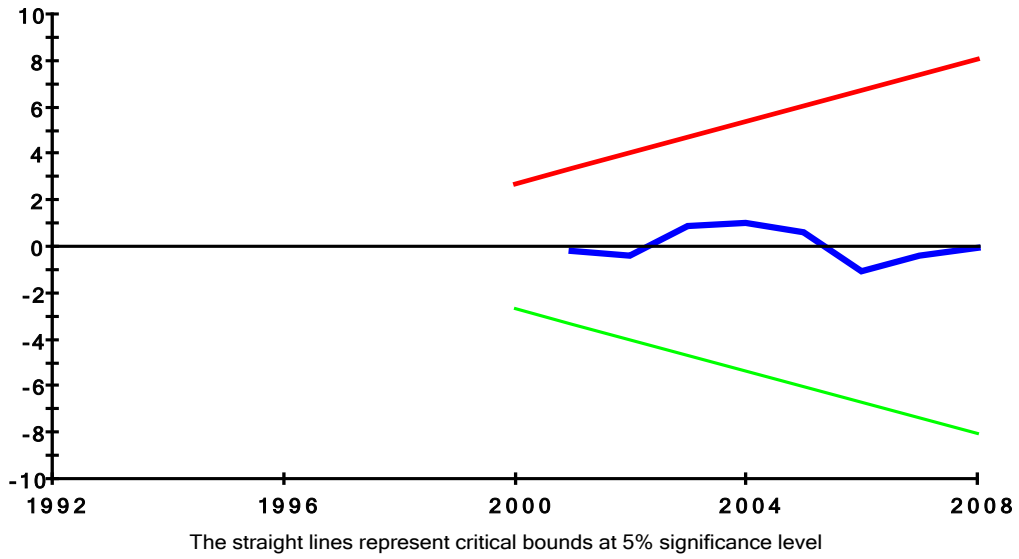
Figure G10: Economic Growth and Value of Stock Traded -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
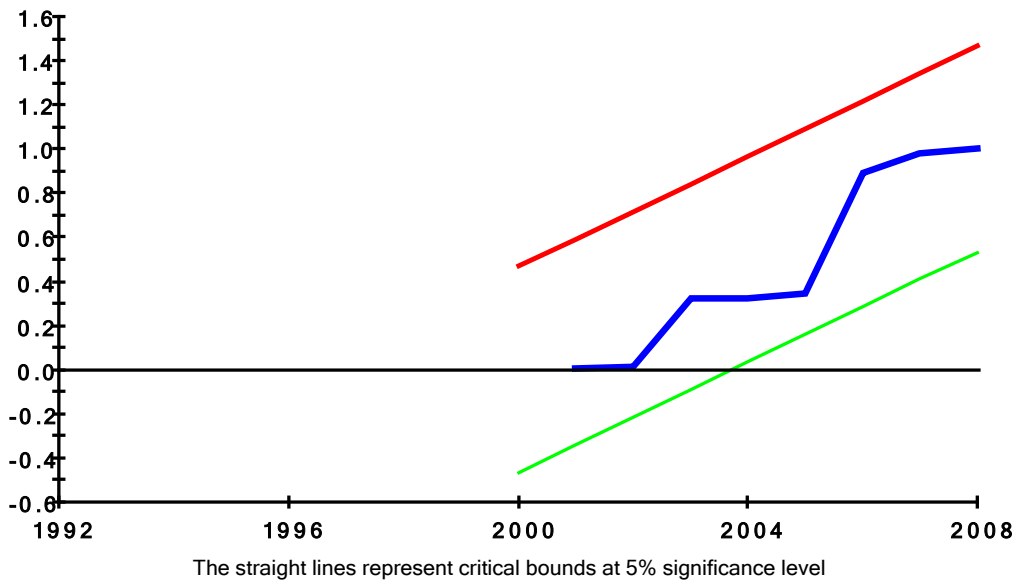
Figure G11: Economic Growth and Stock Turnover - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
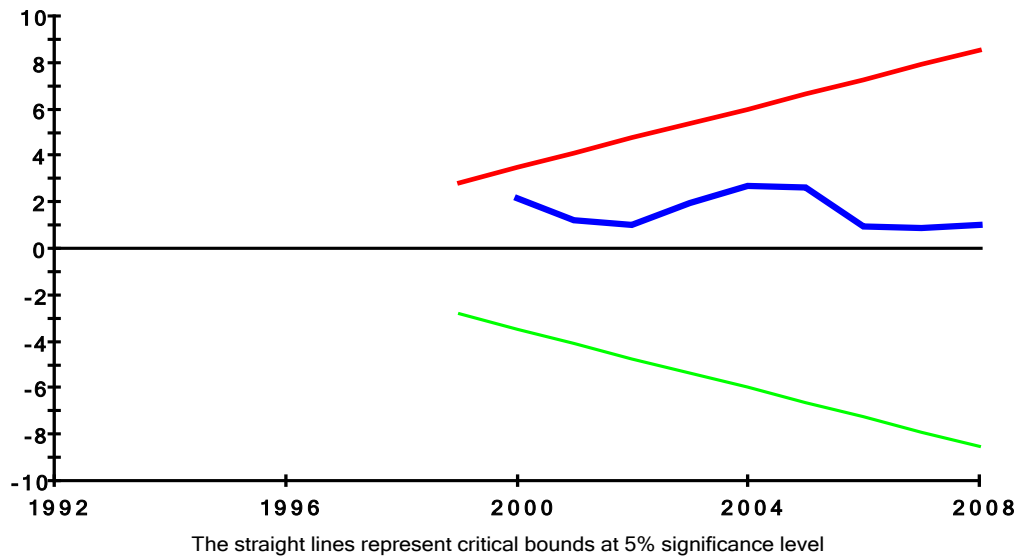
Figure G12: Economic Growth and Stock Turnover -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
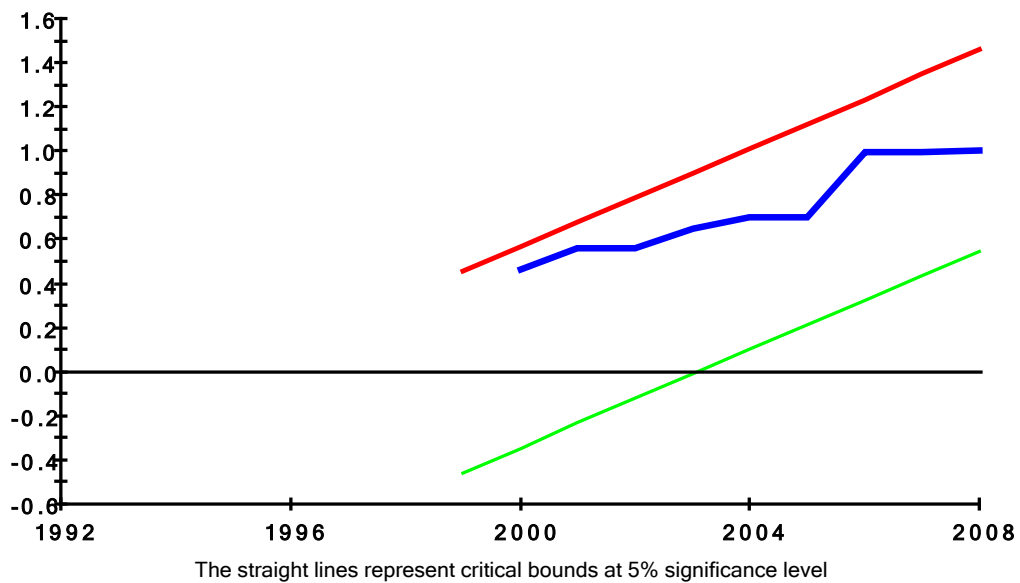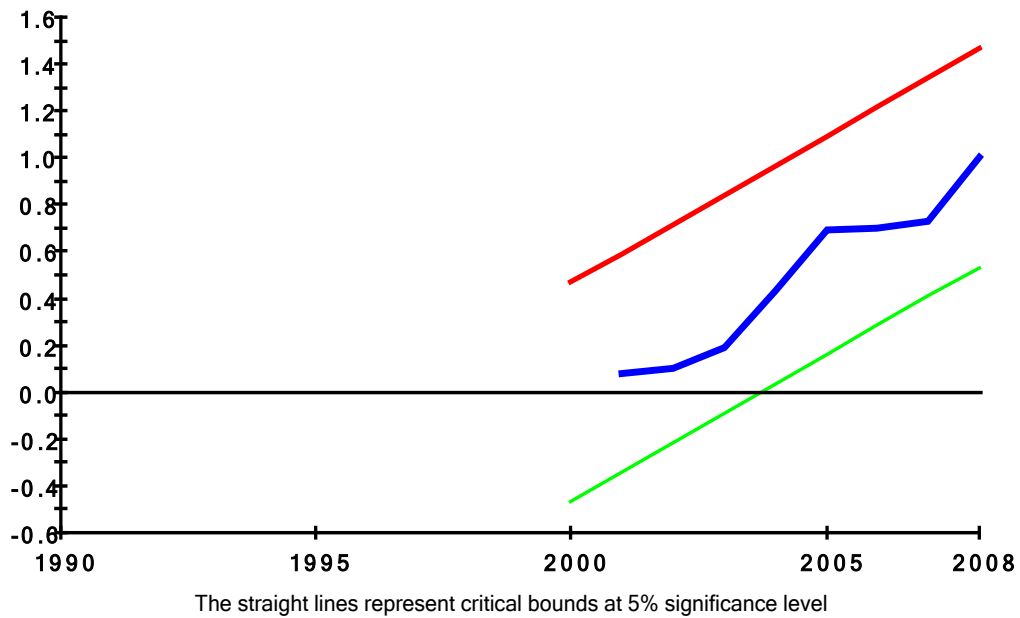
Figure G13: Economic Growth and Stock Market Developments - Plot of CUSUM for coefficients stability for ECM model.
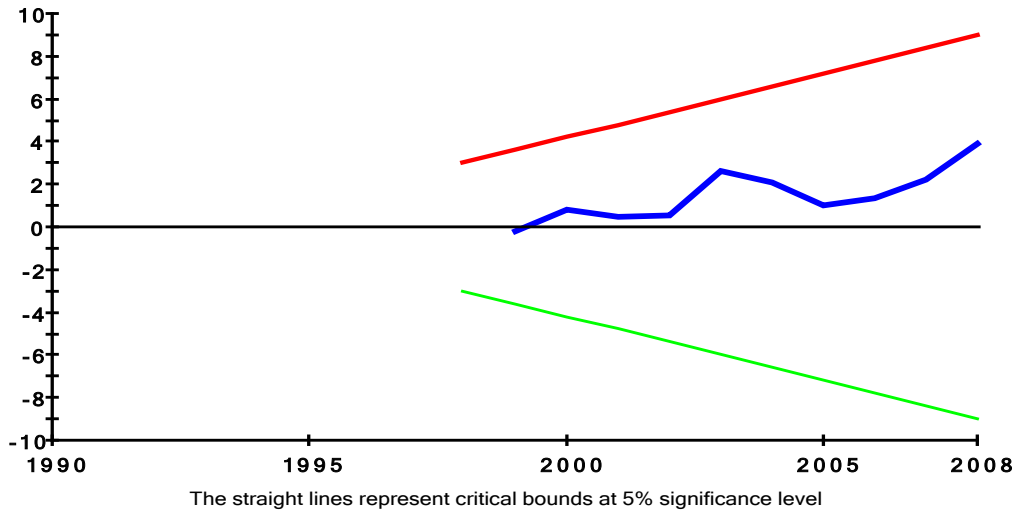

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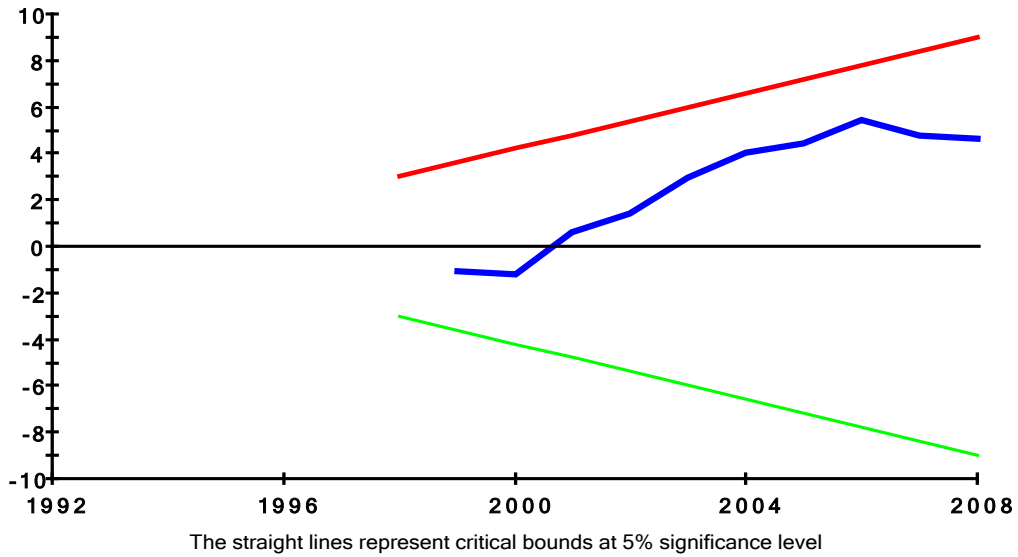
Figure G14: Economic Growth and Stock Market Developments -Plot of CUSUMSQ for coefficients stability for ECM model.

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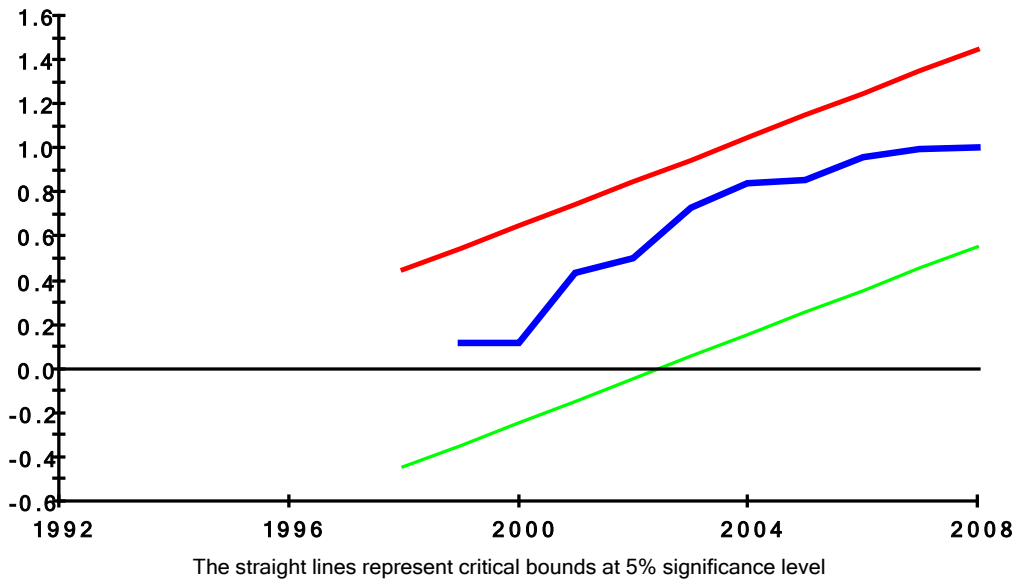
Figure G15: Economic Growth and Financial Liberalisation - Plot of CUSUM for coefficients stability for ECM model.
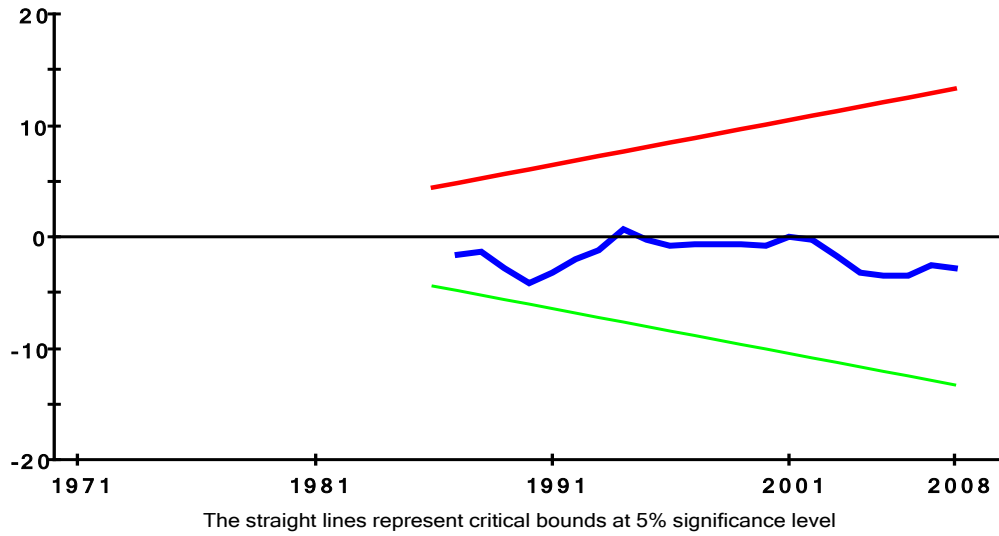

The straight lines represent critical bounds at 5% significance level
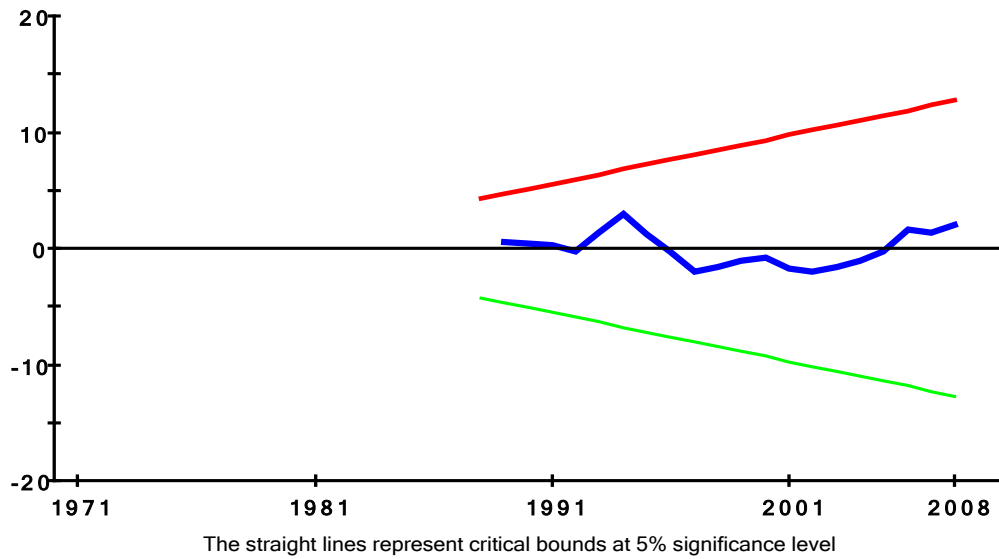
Figure G16: Economic Growth and Financial Liberalisation -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
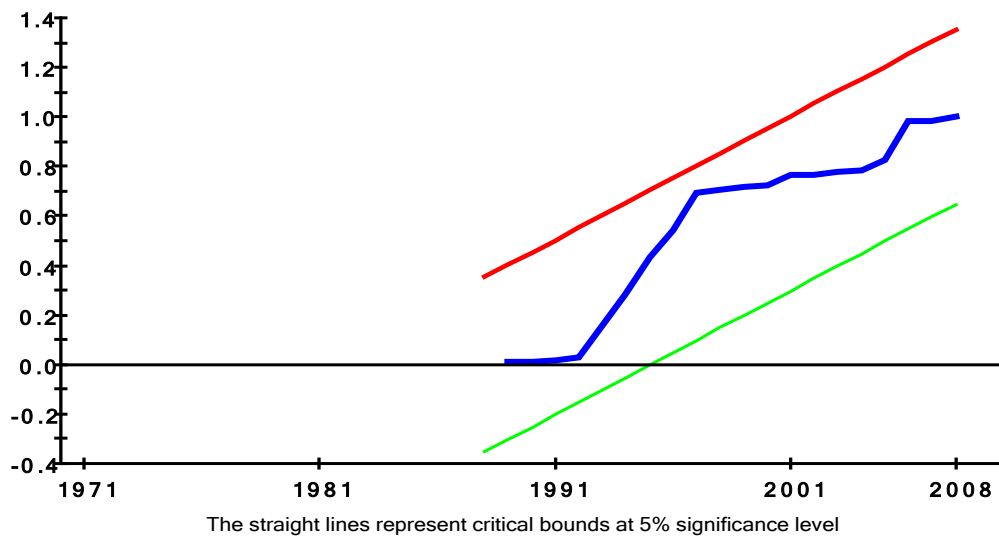
Nigeria

Figure N1: Savings function - Plot of CUSUM for coefficients stability for ECM model.
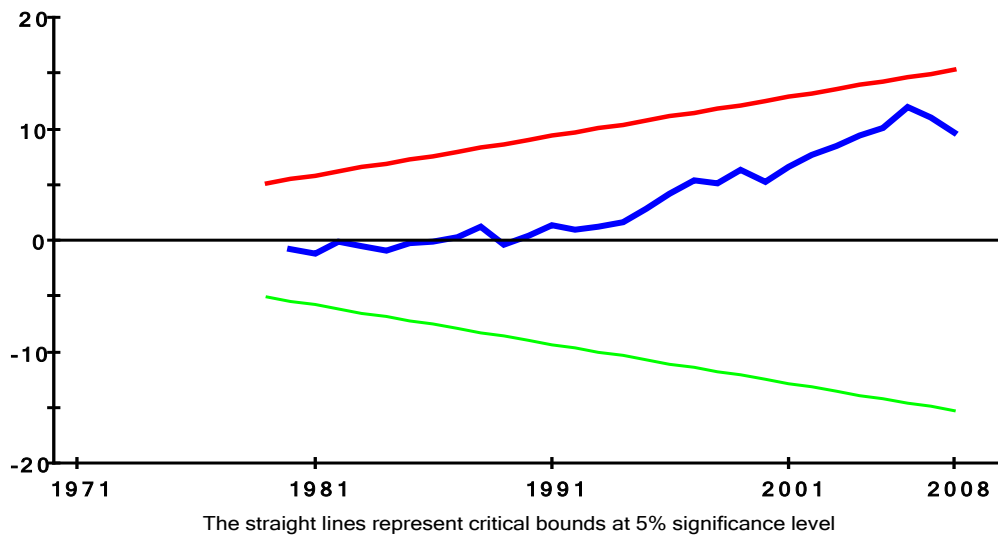
Figure

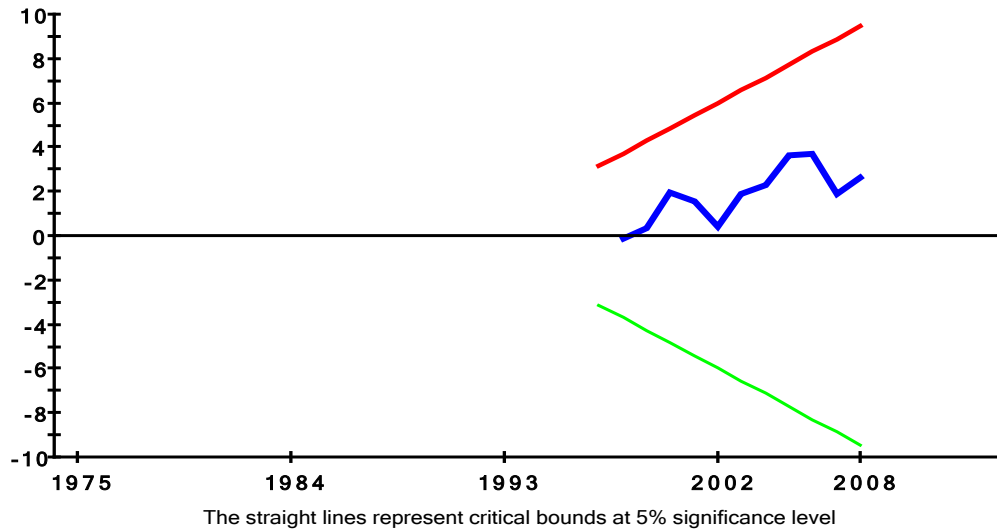N2: Savings function - Plot of CUSUMSQ for coefficients stability for ECM model.
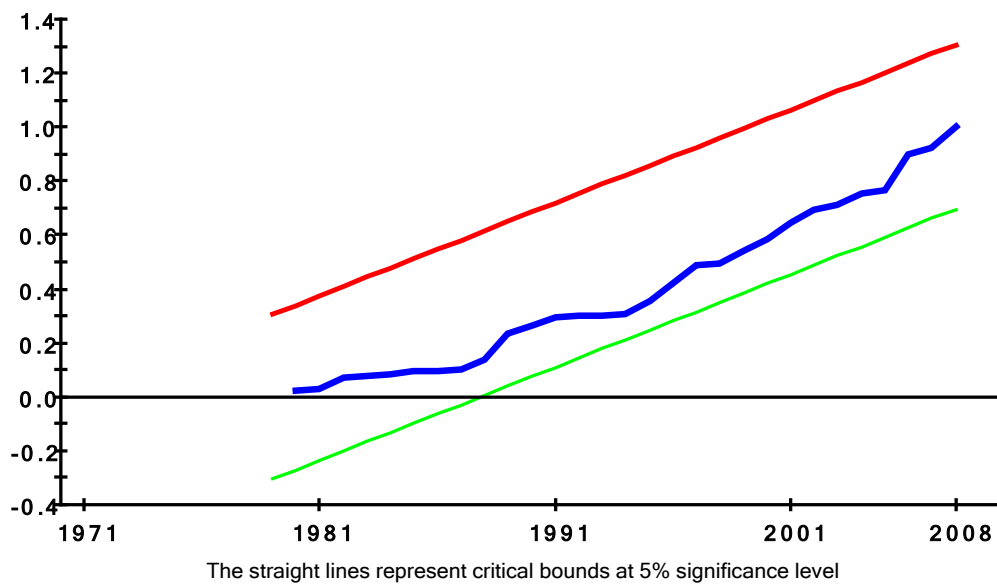
Figure N3: Investment function - Plot of CUSUM for coefficients stability for ECM model.
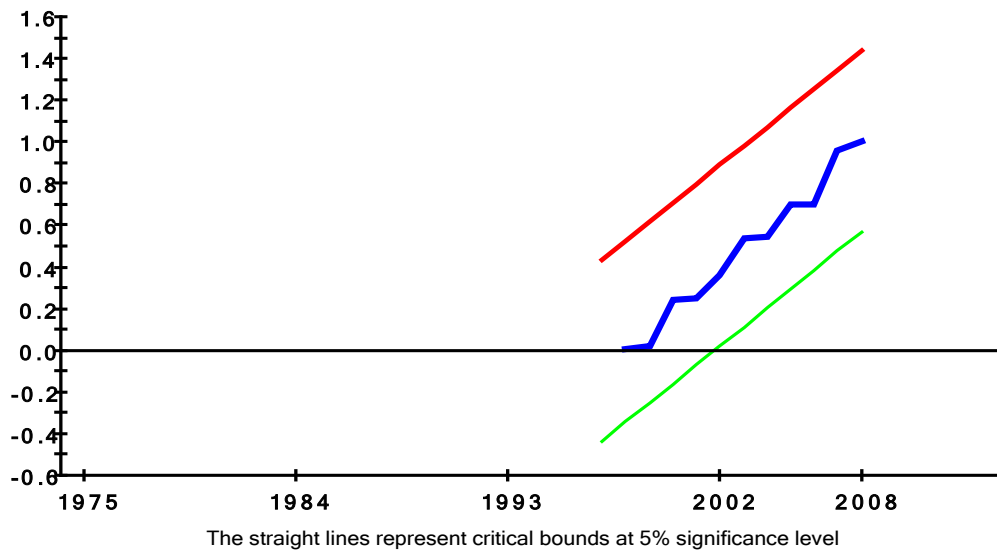

The straight lines represent critical bounds at 5% significance level
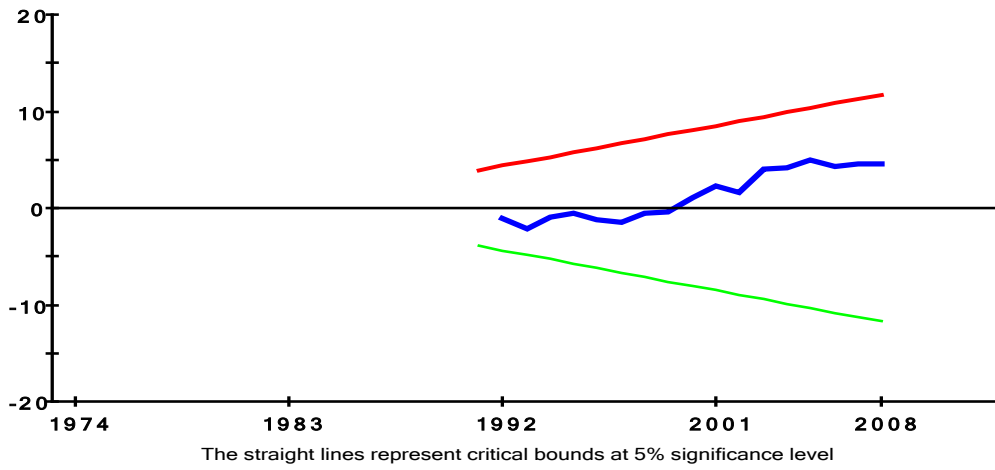
Figure N4: Investment function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
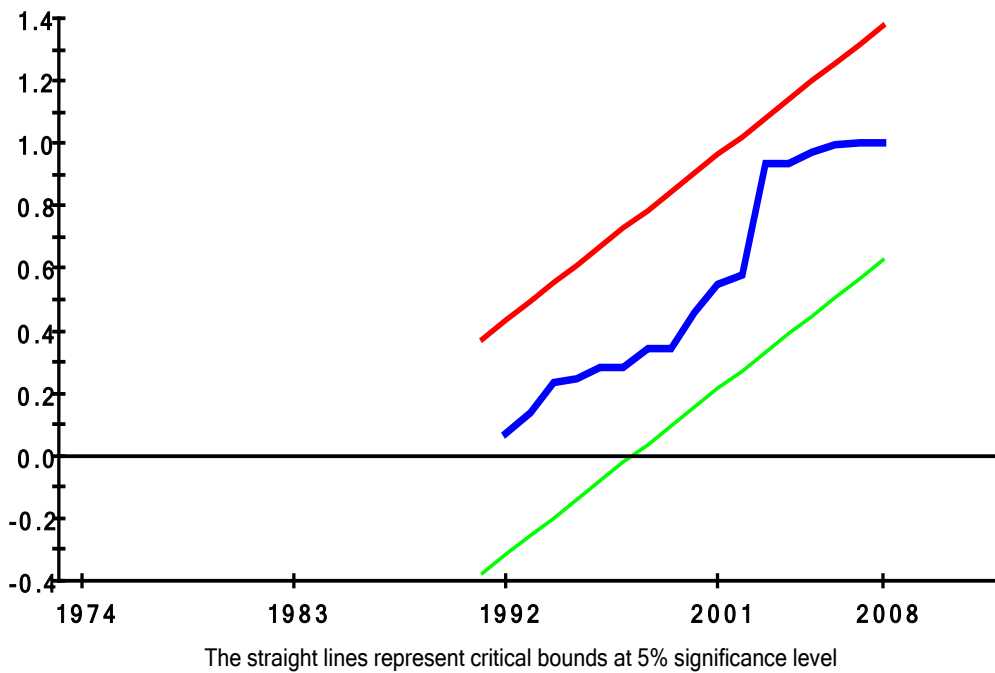
Figure N5: Economic Growth function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
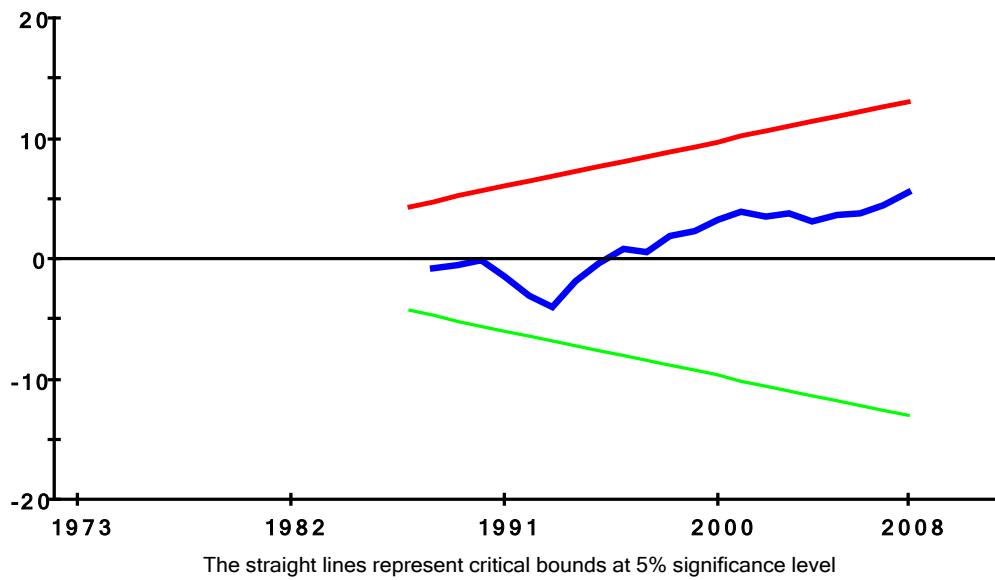
Figure N6: Economic Growth function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
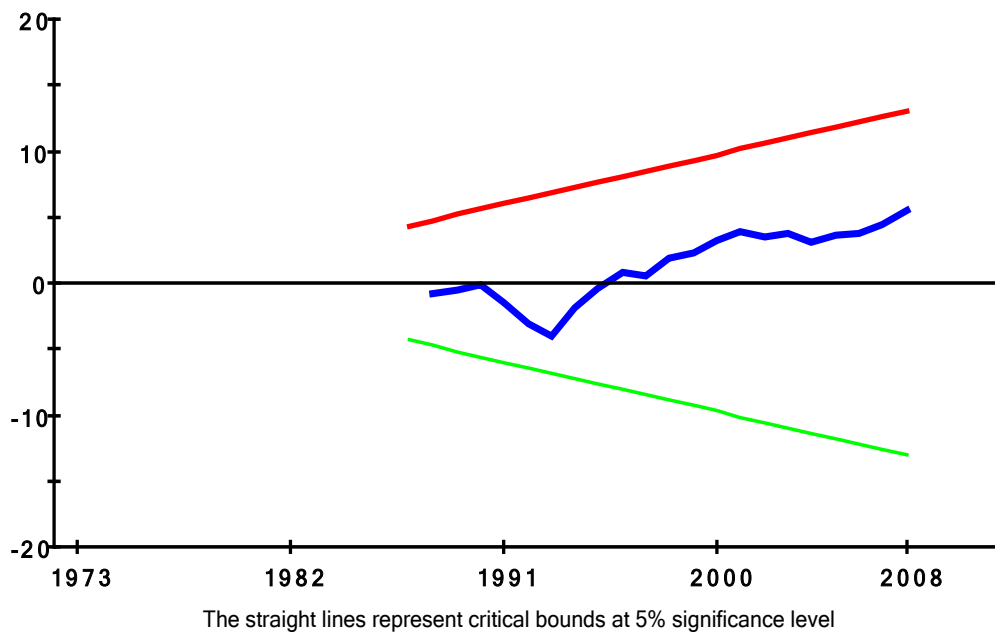
Figure N7: Economic Growth and value of Stock Traded - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
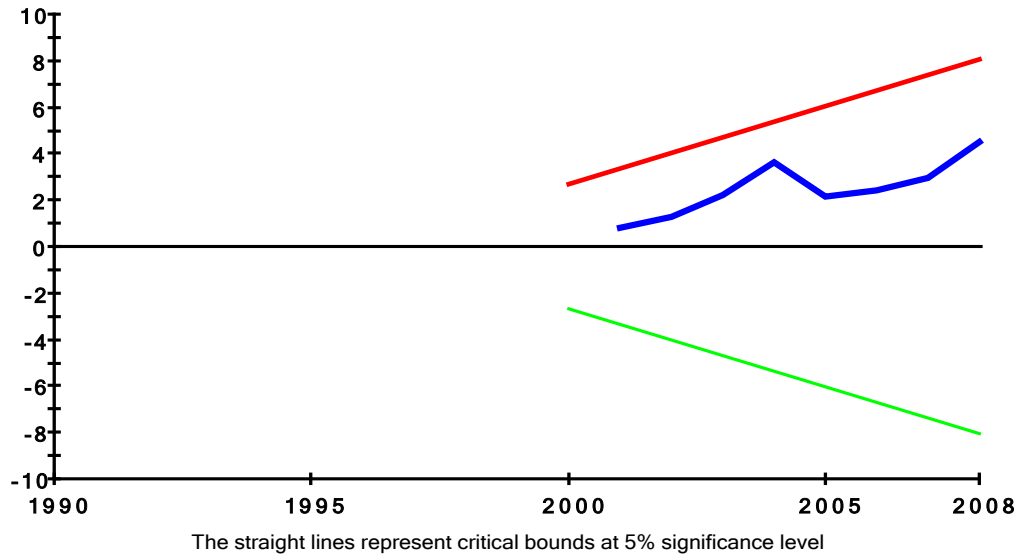
Figure N8: Economic Growth and Value of Stock Traded -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure N9: Economic Growth and Stock Market Developments - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure N10: Economic Growth and Stock Market Developments -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
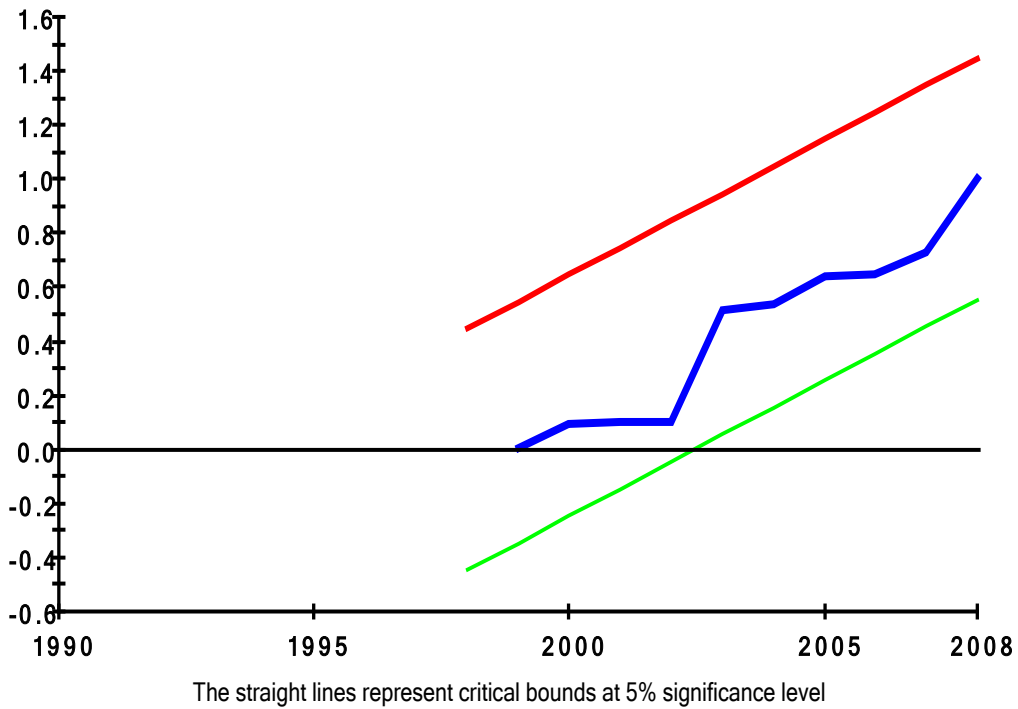
Figure N11: Economic Growth and Financial Liberalisation - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure N12: Economic Growth and Financial Liberalisation -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
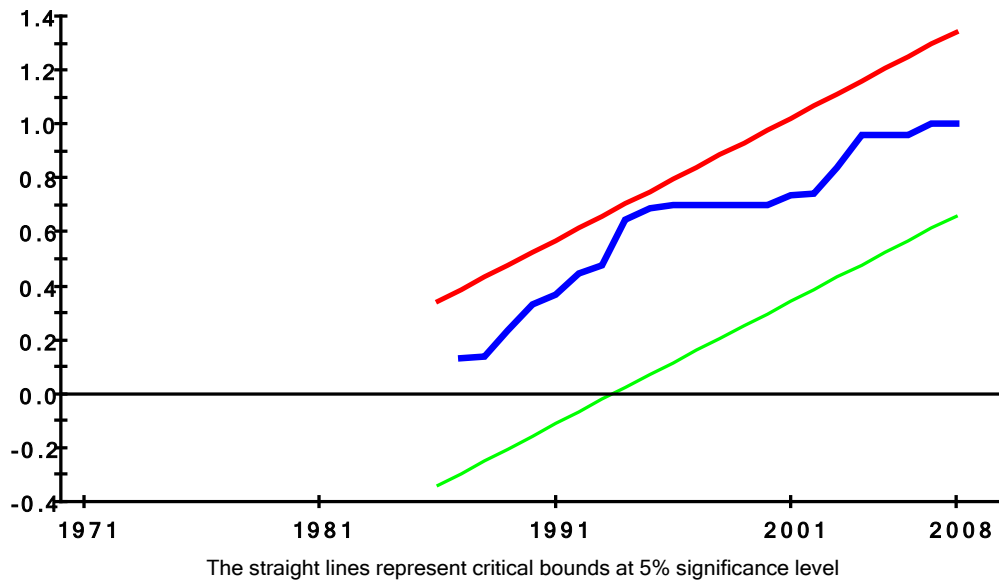
Ivory Coast

Figure IC1: Savings function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure IC2: Savings function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure IC3: Investment function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
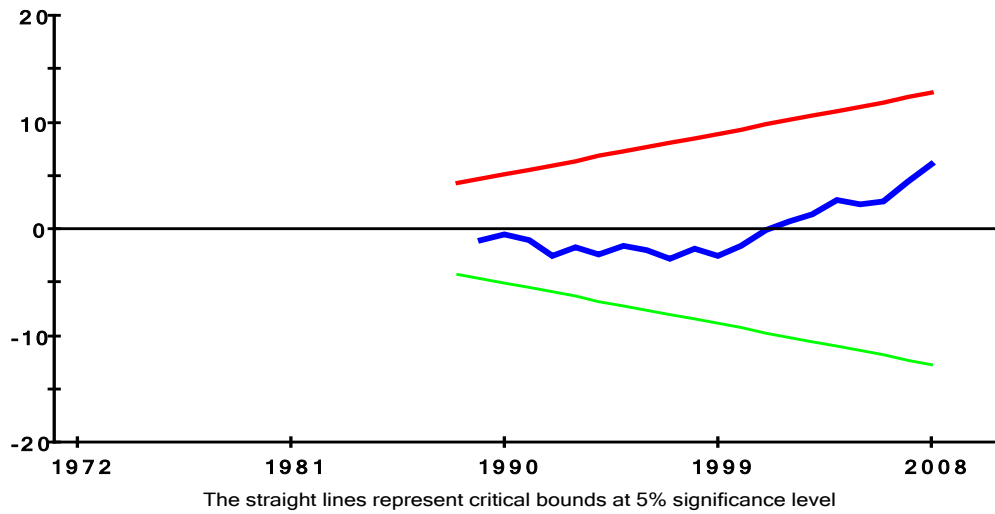
Figure
IC4: Investment function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
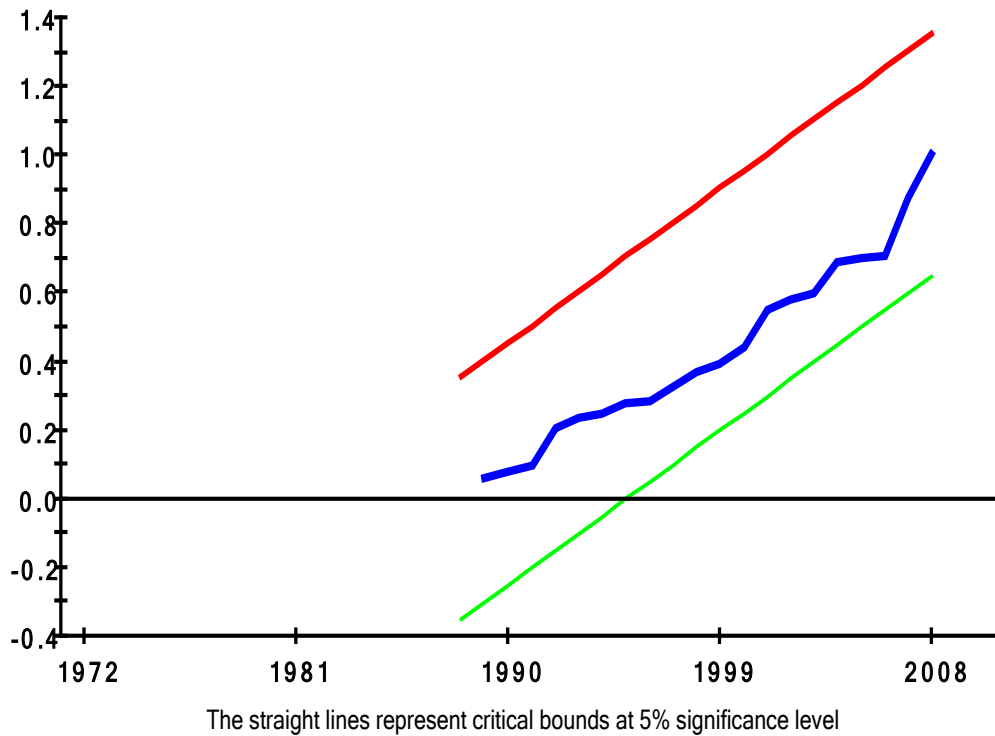
Figure IC5: Economic Growth function - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
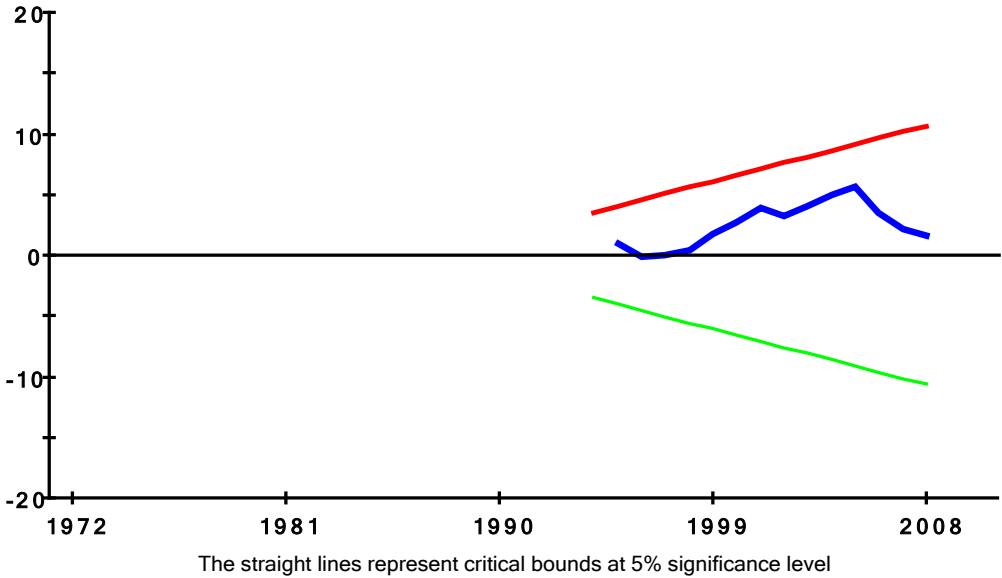
Figure IC6: Economic Growth function - Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
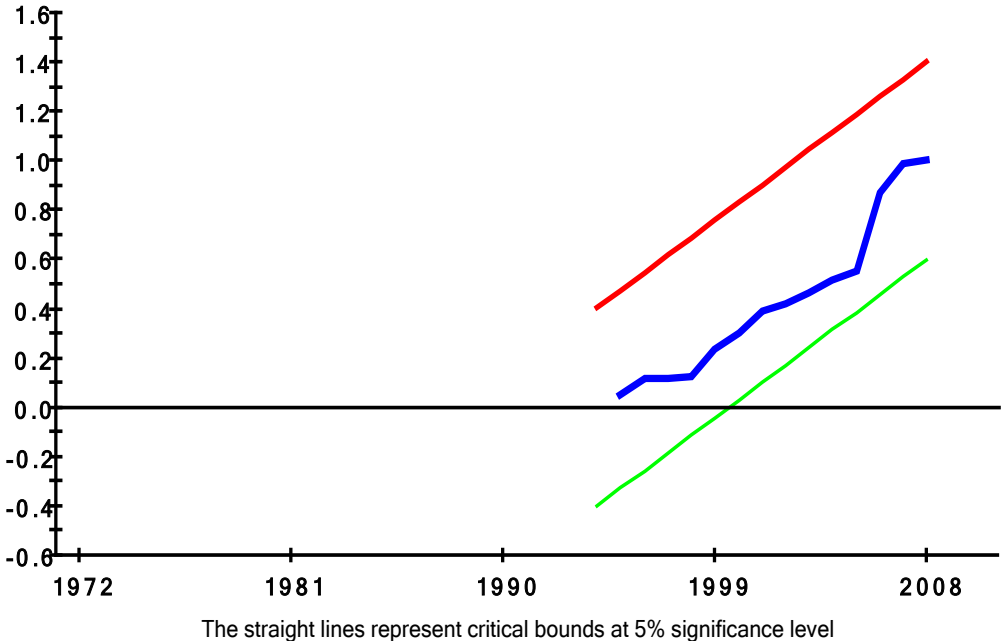
Figure IC7: Economic Growth and Market Capitalisation - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
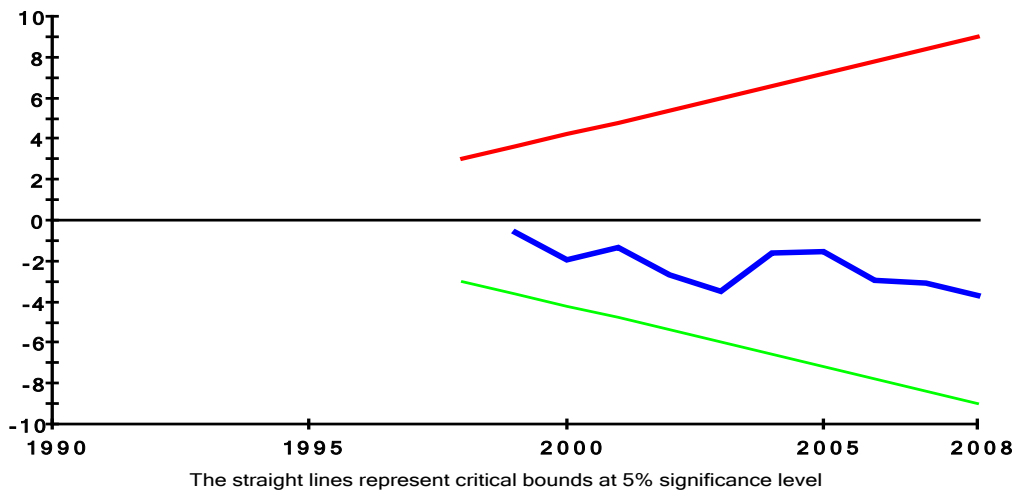
Figure IC8: Economic Growth and Market Capitalisation -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
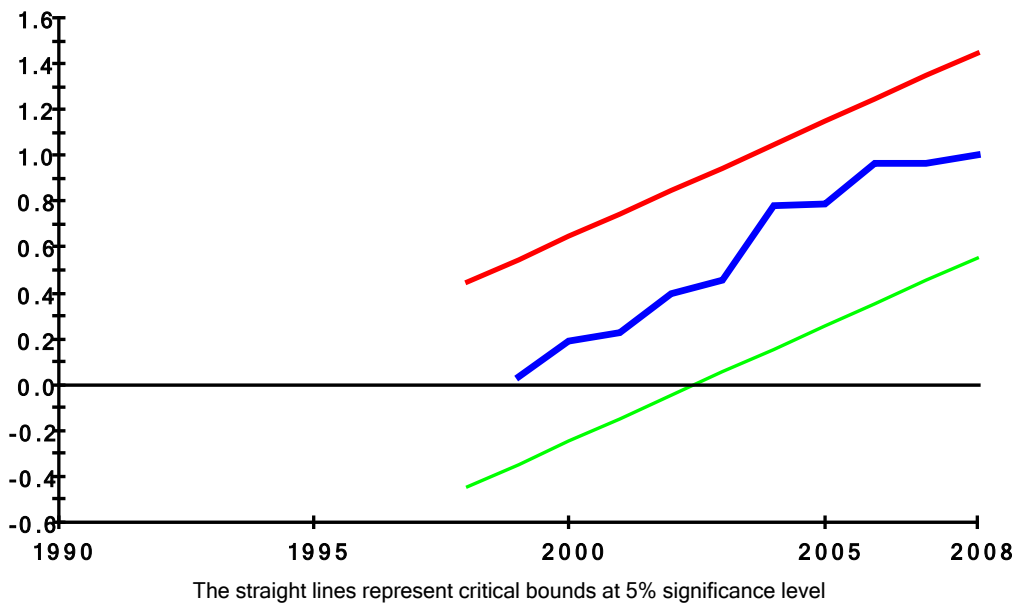
Figure IC9: Economic Growth and value of Stock Traded - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
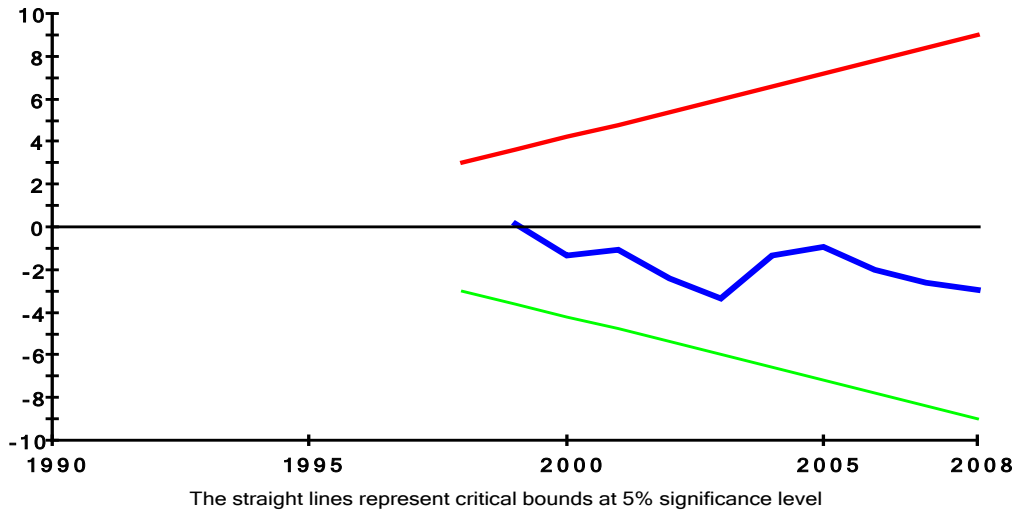
Figure

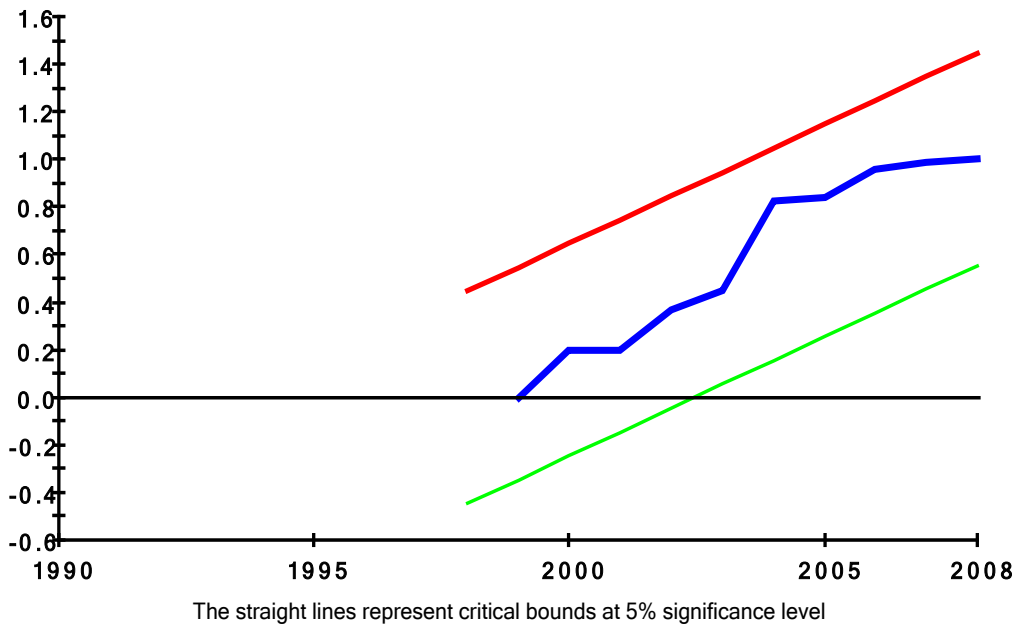IC10: Economic Growth and Value of Stock Traded -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure IC11: Economic Growth and Stock Turnover - Plot of CUSUM for coefficients stability for ECM model.
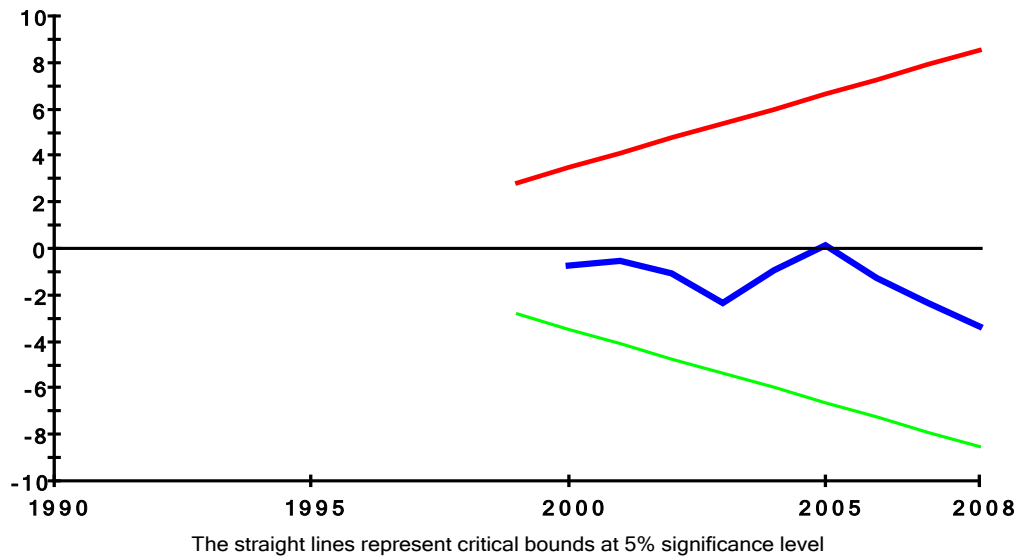

The straight lines represent critical bounds at 5% significance level

Figure IC12: Economic Growth and Stock Turnover -Plot of CUSUMSQ for coefficients stability for ECM model.

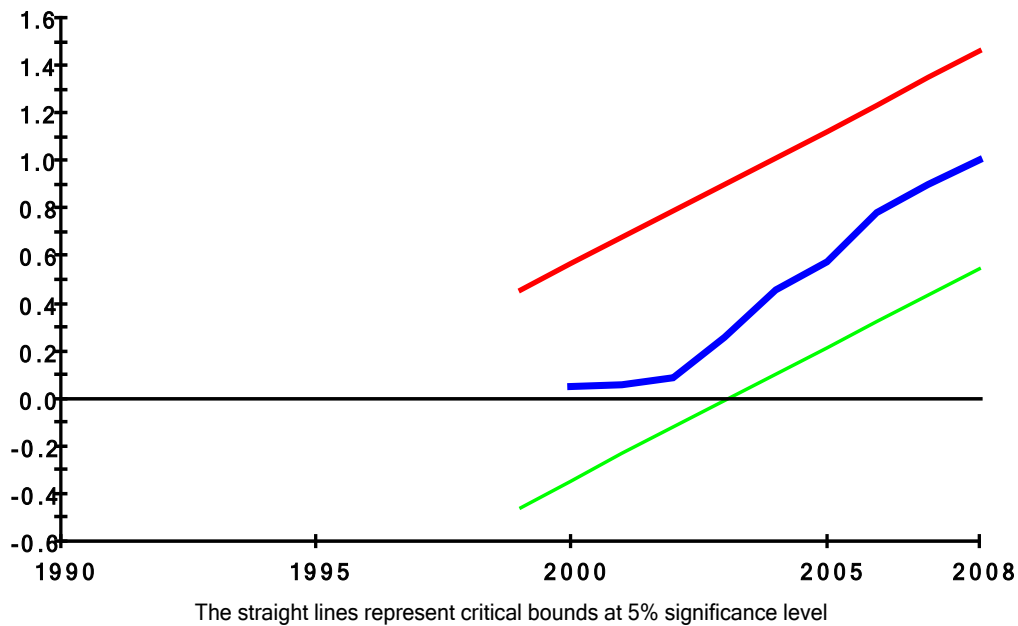The straight lines represent critical bounds at 5% significance level

Figure IC13: Economic Growth and Stock Market Developments - Plot of CUSUM for coefficients stability for ECM model.

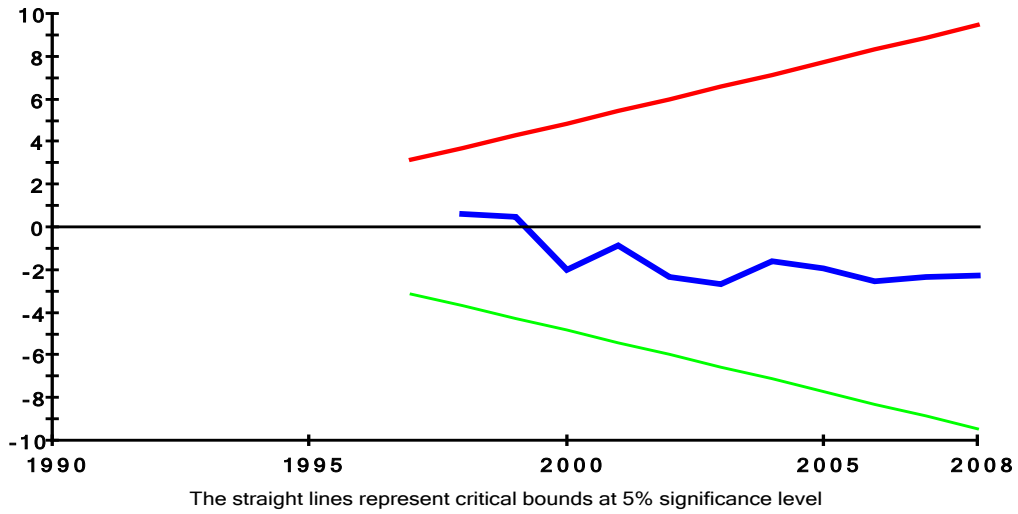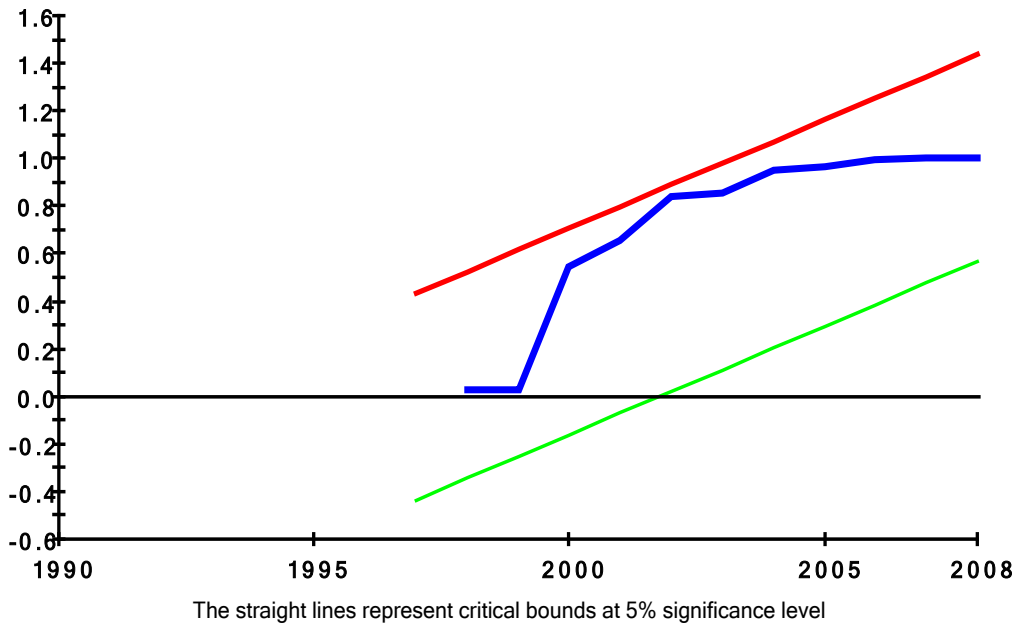The straight lines represent critical bounds at 5% significance level

Figure IC14: Economic Growth and Stock Market Developments -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level

Figure IC15: Economic Growth and Financial Liberalisation - Plot of CUSUM for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level
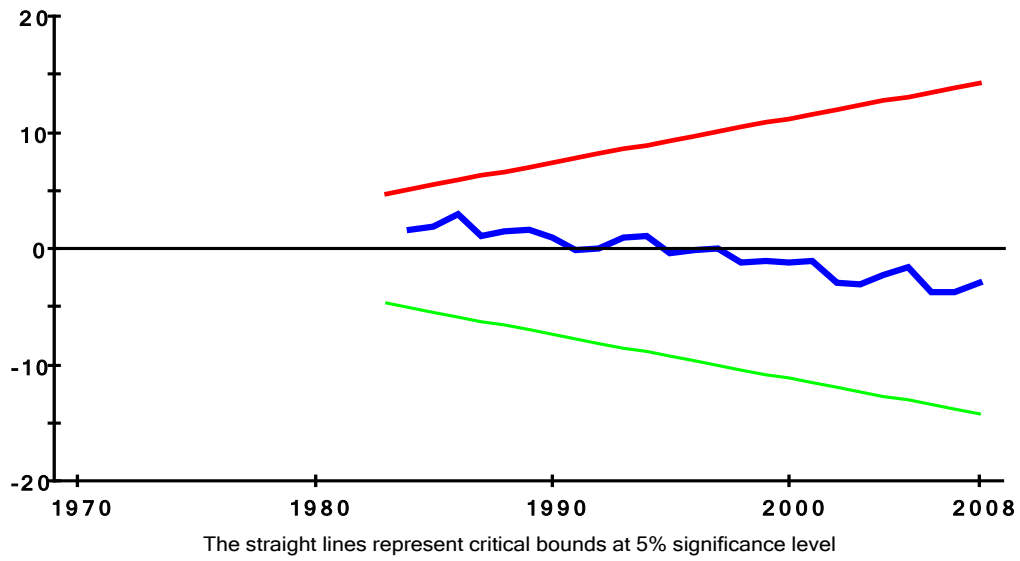
Figure IC16: Economic Growth and Financial Liberalisation -Plot of CUSUMSQ for coefficients stability for ECM model.

The straight lines represent critical bounds at 5% significance level