FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN AFRICA: AN EXAMINATION OF CAUSATION AND EFFICIENCY

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By

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Abstract

This thesis assesses the significance of real bank credit in stimulating real output paying particular attention to the factors that prompt financial intermediation within the economy. The thesis contributes to the existing literature on finance and growth by providing fresh empirical evidence in the case of the Nigerian economy and Africa as a whole. In the context of Nigeria, credit Granger causes output, but the reverse is not true. In testing the factors that mobilise credit, I find that exports are negatively related to credit. Moreover, since credit usually fund non-oil exports, I also find that oil exports is negatively related to credit, whereas non-oil exports is positively related to credit. The latter also explains why capital inflows and imports are positively related to credit in my study.

Extending the analysis to Africa as a whole, I find that causality is bi-directional. In examining the factors which mobilise credit (based on three measures of output); I find that output consistently exerts a positive influence on credit, whereas inflation and exports exert the opposite effect. However, the impact of government expenditure on credit is ambiguous. These results are re-confirmed when I use an alternative estimator for robustness. In line with the variables used in the Nigerian case, both capital inflow and imports positively influence credit while the impact of exports is negative for the whole of Africa. When examining the drivers of output in the African context, I find that credit and exports positively influence output whereas inflation exerts the opposite effect. The role of government expenditure is equally ambiguous. A further robustness test again confirms these results.

The relationship between exports and credit in the literature is positive hence, it is important to investigate why the opposite holds in the Nigerian and African context. As such, I examine the efficiency of the banking system using three different measures, which includes loans, other earnings and other operating income since this may explain the counter intuitive result: export sales in Africa are largely intermediated by multi-national firms who prefer to obtain financing from credit markets that are more efficient than the African banking system. Across Africa, efficiency of the banking system is 74%, 76% and 92% when loans, other earnings and other operating income are respectively used as the output variables. This implies that 26% of credit is allocated in

an unproductive way while 24% and 8% of expenditure could be better managed. When dividing the sample into medium and low-income countries, I find the respective levels of efficiency for each of the measures to be 94% and 11%; 83% and 0%; 90% and 0% for loans, other earnings and other operating income as the output variables respectively. This result supports bank loans as the best output variable, which I use further in the estimation. Further clues as to why there should be such differences in efficiency are obtained when the sample is split by regions, since there are regional variations in the use of credit. The Central African region is the least efficient. In these economies, resources are typically held and allocated by a few individuals.

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CHAPTER ONE

INTRODUCTION

The importance of financial institutions in generating growth within the economy has been widely discussed in the literature. Early economists such as Schumpeter in 1934 identified banks' role in facilitating technological innovation through their intermediary role. Schumpeter argues that the efficient allocation of savings occurs through identification and funding of entrepreneurs who have the best chances to successfully implement innovative products and production processes. Several scholars thereafter (McKinnon 1973, Shaw 1973, Fry 1988, King and Levine 1993a) support the role of financial institutions in generating growth. Khan and Senhadji (2003) discuss the important role of financial depth to economic growth. In their view, more developed economies have more developed financial institutions. This they suggest could be due to policies made to develop the Financial System that eventually aid growth.

A large number of recent empirical studies have relied on measures of size or structure to provide evidence of a link between financial system development and economic growth. Using variables such as the size of financial intermediation or external finance relative to GDP most studies confirm that financial development has a positive impact on growth.

There are alternative definitions of growth used in this chapter such as the level of production within the economy. Other possible measures include total factor productivity, technological change affecting the use of factors of production, and human capital as highlighted in the Schumpeterian approach. Measures of growth range from real per capita GDP and the rate of physical capital accumulation, among others (Odedokun 1998; King and Levine 1993a; Allen and Ndikumama 1998). According to Bencivenga and Smith (1991), capital and labour produces consumption goods in the economy. Therefore, entrepreneurs who own the capital invested in the business use it to employ labour in order to produce goods. They also invest liquid funds into illiquid sources. This results in the production function being made up of labour and capital,

which is useful in the estimation that may account for the increase in the productive base of the economy.

Although the growth-promoting role of financial institution is clear in the literature, there remain divergent views on the issue of causality. If intermediation by banks causes growth, it causes the economy to enlarge the productive base. This in turn results in an increase in the gross domestic product of the economy, thus leading to growth. As Bayoumi and Melander (2008) point out, "a 2½% reduction in overall credit causes a reduction in the level of GDP by around 1½%".

Similarly, empirical findings reveal that economic growth can also be a causal factor for financial development. This often occurs when the level of development within the economy is responsible for promoting the growth of the financial system (a reverse case to the situation earlier described above). Some researchers observe situations with bi-directional causality. One such study is by Demetriades and Hussein (1996) who studied 13 countries and observe all three situations described above. They conclude that the issue of causality is country specific rather than general as earlier hypothesised. Several studies (Odedokun, 1998; Ghirmay, 2004) lend support to his view.

Such findings make it important to examine the relationship between financial institutions and the economy with a view to determining the direction of causality that exists amongst them. In this study, I critically assess whether the financial institutions through their role of intermediation can stimulate economic growth. With previous research work reporting reverse causality, it will be necessary to examine also the direction of causality and to determine the factors that accelerate the growth of financial intermediation.

The Financial System consists of two major arms. These are the banking sector and the stock market. According to Jappelli and Pagano (1992), the term Financial Institution is rather generic and specification is required. This is because different financial institutions could have different effects on growth. The African continent consists of developing countries. For most of the countries within the continent, the stock market

is under-developed and not very important for growth process. Most of the countries do not have sufficient data for stock market activities. In view of this, this study uses the bank level data for estimating the relationship between Financial Institutions and growth.

Three chapters of this thesis investigate the finance-growth relationship: chapter three analyses the relationship between financial institutions, proxied by banks, and economic growth in Nigeria. I discuss the motivation for choosing the Nigerian economy as the base for the study in section 1.2 below. This study adopts various methods ranging from bivariate model as proposed by Ghirmay (2004) in his study of financial development and economic growth in 16 Sub-Saharan Africa countries to a multivariate model proposed by Tang (2003) in his study of bank lending and economic growth in Malaysia. These models assist us to determine the direction of causality between the financial sector and real output.

I further test the robustness of this result using the method proposed by Demetriades and Hussein (1996) which involves conducting ADF tests, examining the long run relationship through the cointegration test and finally the direction of causality using the Error Correction Method (ECM). Likewise, the factors promoting financial sector growth are analysed using the model proposed by Crowley (2008) in his study of credit growth in the Middle East, North Africa, and Central Asia region. This approach adopts the ECM to determine the variables that are significant in the relationship. The present study covers the period 1970 to 2005 for Nigeria- the most populous African country.

My result shows reverse causation between finance and growth in Nigeria. This implies that the Financial Institutions are not well positioned or engaged in activities that propel growth within the country. Rather, the growth witnessed within the economy is due to the enlargement of their productive base, which actually stimulates banks to engage in an increased intermediation within the system.

Furthermore, the results also show that the use of the bivariate model cannot adequately explain the relationship that exists between the Financial System and economic growth. This is because the bivariate model fails the essential tests for least squares estimation. In addition, it emerges that exports (which are a major economic activity with heavy reliance on oil-exports), are not very good in stimulating financial development. Instead, we find that imports and foreign capital inflows to be very important for this purpose, implying a weak link between real economic activity and financial institutions.

Subsequently, I check whether this situation equally applies to the African continent. The second empirical chapter focuses on the estimation of the relationship that exists between the financial intermediation and growth relationship. I also analysed the factors that stimulate financial development in Africa

To analyse the relationship, this study uses variables as defined by King and Levine (1993a) who conducted a cross-sectional study on about 80 countries for a period of thirty years (1960 – 1989) using four different measures for both growth and finance respectively. However, Demetriades and Andrianova (2004) observe that they do not address the issue of causation between finance and growth. Likewise, the paper uses a cross-country methodology. With this approach, one is at best dealing with the average effects of the variables. The results show bias in favour of countries without outliers in the presence of variables with outliers, (Demetriades and Andrianova, 2004). The paper is also criticised for grouping countries with different levels of development together (Levine, 2005) and for not using money outside the banking system as a variable in the estimation. This is an important omission because the developing countries are cash dependent.

To overcome some of these limitations, I use the GMM method of panel estimation to determine the direction of causality between finance-growth. This method has several advantages over cross-sectional or time-series (Habibullah and Eng, 2006). Firstly, working with a panel increases the degrees of freedom by adding the variability of the time series dimensions. Secondly, in a panel context the method allows for control of

the unobserved country-specific effects and thereby reduces bias in the estimated coefficients. Thirdly, the panel estimator controls for the potential endogeneity of all explanatory variables by using lagged values of the explanatory variables as valid instruments (see Levine *et al*., 2000). Fourthly, the small number of time-series observations is not important given that all the asymptotic properties of the GMM estimator rely on the size of the cross-sectional dimension of the panel (Beck *et al*., 2005). Finally, when the number of cross-sectional units is much larger than the number of time-series periods, the non-stationarity problem commonly seen in time-series data can be reduced (Holtz-Eakin *et al*., 1988). The method assists in determining the direction of causation.

Likewise, I analyse the factors that promotes financial sector growth using the variables proposed by King and Levine (1993a). I support these with variables suggested by Crowley (2008) in a panel study of credit growth in the Middle East, North Africa and Central Asia region. In this thesis, For this study, I employ panel data techniques for 31 African countries covering the period 1985 to 2005.

My results show that money outside the banking system does not correlate with our proxies for growth whereas other proxies for financial development are highly correlated with growth proxies. Thus, the non-inclusion of money outside bank coffers in the study by King and Levine (1993a) is justifiable and I omit this variable from further estimations. Secondly, my findings suggest that the relationship between financial development and growth for Africa displays bi-directional causation. Furthermore, exports exert a negative effect on financial development. Briefly, this may be due to exports of goods and services within the continent which does not contribute to the growth of the banks; this issue is discussed in more detail in the second chapter of this thesis. The results also suggest that increased imports and foreign inflows are beneficial for financial development.

These results imply that the banks are not relevant in stimulating the real sector of the economy, which implies that the economy expects the real sector should mobilise the financial sector to increase the productive base of the economy. Although, according to

Frankel and Romer (1999), trade proxied by exports generates growth, this situation does not hold for Africa, despite their large dependence on exports in the form of oil and other natural resources. This result is similar to what I obtain for the Nigerian economy. I revisit this issue in the fifth chapter where I look at the efficiency of the banking sector in identifying productive projects. The view that financial institutions enhance the productive base of the economy is prevalent in the literature. However, studies find that the financial sector notably the banking industry in Africa are under-developed and not well positioned to assist their respective economies to grow. Several firms within the continent will rather seek funding outside the region (if opportune) for various reasons. This situation may have a detrimental effect on growth and banking sector development of the continent. Consequently, it is important to examine the nature of banking intermediation in Africa.

There are two main techniques in the literature to determine the efficiency of institutions. These are the Data Enveloping Analysis method (DEA) and the Stochastic Frontier Analysis method (SFA). These two methods are in use widely and it is somehow difficult to say which is better although they have differing abilities. According to Berger and Humphrey (1997), SFA is a better tool for benchmarking relative performances. This is because "it permits individuals with very little institutional knowledge or experience to select best practice firms within the industry, assign numerical efficiency values, broadly identifies areas of input overuse. Secondly, in the hands of individuals with sufficient institutional background, frontier analysis permits management to objectively identify areas of best practise within complex service operations". In essence, it is a useful tool to understand the numerical efficiency value and the X-efficiency of firms. Apart from the above reasons in favour of SFA, the DEA is a tool that is not efficient with unbalanced panel, whereas SFA is able to cope with it.

In view of these reasons, we use the SFA methodology to analyse the efficiency of the deposit money banks in Africa. There are two measures of efficiency available in literature, which are the cost function and the production function. The cost function approach considers the banks sources of funding as input while the usage of funds proxied by loans are output. This seems rational for the type of the operation of the

banking sector, which uses the customers' deposits to create loans. For the purpose of this thesis, the cost function is appropriate and I propose it for the study. Due to the nature of the banking service sector, I propose a multi-output/input approach such that the output consists of loans, other earning assets, and non-interest revenue. The inputs are capital, deposits, and labour (overhead). I extend the analysis further by calculating the x-inefficiency after dividing the continent based on the income categorisation of the countries and sub-regions as a robustness check. Data for the study are from datascope – a rich source of financial information. The study covers ten years from 1998 to 2007, for 47 African countries.

The result shows that the level of inefficiency of the financial sector ranges from about 10 to 26 percent. When I divide the countries according to income classification, it shows that much of the inefficiency within the continent is attributable to the low-income countries. The efficiency of the medium income countries is even higher than the average within the continent. Poor intermediation and possibly low skilled labour explains much of the inefficiency within the continent. Banks in Africa, mostly those in the low-income countries should be poised to eliminate inefficiency through a reduction in the cost of banking transactions and by ensuring a good level of intermediation mostly for the real sector of their economies. When I re-group the sample according to regions, the Central African region is the least efficient. This result reduces the importance of income level, but justifies bank intermediation. Countries within the Central African region are more of middle income, but have low private sector credit generally.

1.1 Objective of the Study

As stated previosuly, financial intermediation is a crucial function of banks and accounts for a significant share in their operational activities. The question we pose then is "how relevant is the performance of this function to the growth of the economy where they operate" in line with available theories and evidence in the field.

The aim of this thesis is to examine the contribution of commercial banks' credit to gross domestic product using various models to determine the importance of the credit function, and by inference financial institutions, in generating growth. Based on past and current trends drawn from historical data, the study examines the effectiveness of this sector and the direction of causality. The thesis also identifies the factors that are crucial to the growth of the financial sector, and make suggestions that will assist the sector. As previously stated, the study focuses on the Nigerian economy in the first instance and subsequently on Africa.

The main thrust of the third empirical paper is to examine the intermediation activities of the deposit money banks in Africa and whether they have been discharging these activities efficiently. This is because banks in the continent are not intermediating for exports. Meanwhile, most countries within the continent are highly dependent on natural resources and/or agricultural products, which they export to other parts of the world. This process should ideally facilitate a robust relationship with the financial sector in the form of financing these products, hence the expected positive relationship between financial development and export. This assumption does not hold for African countries. The main question we then ask in this study is whether banks in Africa intermediating efficiently or whether variations in the error component in the relationship account for the X-inefficiency. In this study, I explain the main cause of the inverse relationship between financial development and exports and make suggestions for policy measures.

1.2 Motivation for the Study

The first empirical paper in this thesis focuses on Nigeria, which is the most populous African country (140 million people) is representing about 20% of the continent's population. The country is also one of the world's top eight producers of crude oil in the world. Although the recent Article IV[1] report suggests Nigeria will be an emerging economy soon. The country is amongst the poorest economies, thus, it is crucial to

[1] IMF (2008) Article IV Consultation with Nigeria, IMF Publication No 08/16

examine the finance-growth relationship in Nigeria. We need to be able to answer the question: Are Nigerian financial institutions effective in generating growth and thus welfare?

There has been a renewed interest globally into the study of credit and its ability to generate growth. These studies concluded that firms that are able to get external finance are more likely to grow than firms that are limited to internal finance only. Beck et al (2005), Levine (2002) and Boyreau-Debray (2003) note that rather than total credit of the banking sector, it is the efficiency of credit allocation that is important for growth. According to them, credit to the public sector is weak in generating growth within the economy because they are prone to waste and politically motivated programmes, which may not deliver the best result. In other words, they conclude that financial development has a positive impact on growth if efficiently channelled. It is thus important to examine whether this postulation holds for Nigerian economy.

Similarly, there is detailed information about Nigerian banking history, but little information is available about the activities of the financial industry and their effect the economy. Specifically, factors that motivate or drive credit growth within the economy are largely under-researched, which is surprising given the importance of ensuring that financial institutions have the desired effect on the real economy. In summary, both credit and GDP growth have attracted little attention from researchers on Nigeria and there is a dearth of information on critical areas relative to the financial industry. This thesis will shed light on these areas.

The Nigerian deposit money banks dominate the financial sector and account for a large proportion (above 90%) of transactions[2] within the system. Since the above clearly shows that, the deposit money banks dominate the Nigerian banking scene, it therefore become imperative to study the effectiveness of these banks on the economy and the factors that are very crucial to their continued relevance to the system.

[2] This measured as the percentage of total assets of the deposit money banks to other financial institutions within Nigeria

The second empirical study in chapter four focuses on a large number of countries in Africa, which share similar features with Nigeria. Despite their natural endowments of oil in some countries and vast hectares of land which are used for farming, almost the whole continent live below the poverty line. Again, this situation makes it important to assess the contribution of the financial sector to the level of growth within the continent.

The recent crisis in the financial sector has further laid emphasis on the crucial role of banks in determining the growth. It also re-emphasises the need to monitor continuously this very important function of banks. One of the ways of ensuring effective monitoring of the banking and financial system is to further our understanding of the behaviour of financial institutions and our understanding of the channels of the transmission mechanism through which they can affect the real economy. This thesis contributes to this area. Secondly, as earlier mentioned, the involvement of banks in intermediation may not necessarily generate growth. As in the case of Nigeria, the critical point here is that, it is not the volume of financial intermediation per se that matters, rather it is the selection of efficient uses of credit that generate growth. Thus, Beck et al (2005), Levine (2002), and Boyreau-Debray (2003) emphasised the importance of efficiency of the allocation of credit rather than the volume of bank intermediation. This issue becomes even more pertinent due to the peculiar situation of developing countries. In economies with weak institutions, there may be substantial divergences between the two. Based on this assertion, it is important to examine whether the above postulation holds for Africa.

The third chapter of this thesis examines Nigeria by using time series methods for about thirty-six years (1970 – 2005) and reveals that the economy is not dependent on exports for the development of the financial sector. In the fourth chapter, I use the same approach to examine Africa as a whole. It turns out that capital inflows, which are a significant factor for financial development in the case of Nigeria, have similar effects on Africa

Most African countries fall under the low-income category with per capita income at the lowest quartile of the global distribution. This is against a backdrop of abundant natural

resources, which have failed to generate a commensurate level of wealth for these countries.

Previous empirical work has established that the role of banks in the course of intermediation is very significant in promoting growth within the economies. This they attributed to financial support for the firms, which results in enhanced productivity base for the country. This view supports a robust and positive relationship between financial intermediation and trade. However, for the developing countries in Africa, this postulation does not hold, as my studies point to the existence of a significant inverse relationship i.e. exports and financial development are not positively related. One main argument is because the financial sector does sufficiently support firms. They are unable to maximise output and thus they cannot generate positive feedback effects on the financial sector. In other words, the financial sector is not discharging credit efficiently to harness the gains of such activities.

In view of this, I examine the level of efficiency of the banking sector in Africa and determine the extent of their inefficiency. To the best of our knowledge, there are no previous studies on the efficiency of banks covering the entire continent. Most of the studies are country specific. Finally, I check whether regions and level of income are relevant in the determination of x-inefficiency for countries.

1.3 Contributions

Having discussed my general approach in the context of the literature, in this section I underline my specific contributions to the finance-growth relationship in Africa. In as much as there is a settled debate about the relevance and importance of the financial institutions in generating growth within the economy, the literature is not clear about the direction of causation that exists amongst them. Patrick (1966) describes the direction of causality as supply leading and demand following. Subsequent studies by Demetriades and Hussein (1996) on 16 less developed countries between 1960 and 1990 find bi-directional causality in six countries and reverse causality in six countries

while South Africa showed no evidence of causation between the variables. This has led to a growing debate on the direction of causation that exists between finance and growth. This thesis adds to the literature on the developing countries and establishes that the direction of causation for Nigeria is a reverse causation while for the thirty – one African countries using panel studies is bi-directional. The study supports the postulation by Demetriades and Hussein (1996) that the issue of causality is country specific rather than general. It also supports the study by Rioja and Valev (2003) that if the proxy for finance falls below the minimum threshold, then it will not be in a position to exert appropriate impact within the economy.

The study also shows that the source of financial intermediation is crucial. If credit is disbursed by foreign banks, there will be little impact on the development of the domestic financial sector. One channel by which this may occur is exports. My results show that for both Nigeria and Africa as a whole, I find that export does not support financial development. Rather, imports and foreign capital inflows are more significant in this regard. Many studies have examined the effect of foreign inflows on the economy, but none has analysed the relationship between it and financial sector development.

The lack of significance of trade places a significant hold on foreign inflow to mobilise the financial sector. Though the trend of real foreign inflow has been volatile, the effect is significant for financial development. A major reason for this scenario is that the financial institutions in these countries are largely undeveloped hence; the private sector seeks for funding from other countries for so many reasons that I discuss in the next chapter. The economies that ultimately provide the required funding for these economic activities eventually develop while the domestic financial institutions remain undeveloped.

My results also show that the non-inclusion of money outside the banking system in the study by King and Levine (1993a) is justifiable. From the result of my second empirical paper that focuses on the African continent, I try to include this variable, but

realise that out of all the proxies for financial development included in the study, only money outside the banking system does not correlate with the proxies for growth. This infers that though the developing economies are cash dependent, the quantity of cash kept outside the banking system may not contribute to the growth of the economies. In addition, the inclusion of developing countries in the King & Levine study along with developed countries does not give a fair representation for these countries in the sample and this may explain the observed bias. This study provides evidence on countries that are relatively close in terms development, and eliminates the bias that may occasion group of countries with different levels of development.

In chapter five, I empirically show that banks in the developing countries are highly under-developed and that the level of development affects the efficiency of these institutions. The level of economic development is accountable for the level of efficiency displayed by the financial institutions within the economy. The average level of inefficiency is estimated at about 10-26 percentage, however, the inclusion of a low-income economy increases the level of inefficiency, and vice versa for the medium income economies. I further re-group the sample into regions and observe that Central Africa is the least developed region. This shows that the level of efficient intermediation in this region is the poorest in the continent.

The findings also suggest that the presence of a medium income economy in a group of low-income economies has a positive effect on the efficiency of the institutions within the area. Unavailability of a medium income economy is detrimental to the level of efficiency of the deposit money banks

To conclude, this thesis has shown that financial institutions are positive tools for economic growth if their activities are channelled efficiently. Presently, the quantity of credit to the private sector is very poor, and this largely affects the efficiency of the banking system. The situation is reversible, but both the government and the banking system needs sound policy advice and this thesis contributes to that effect.

1.4 Organisation of the Study

This thesis analyses the relationship that exists between Financial Institutions and economic growth for thirty – one African countries. It consists of three empirical chapters, which are chapters three, four and five. The first chapter gives a general background to the study, stating the objective and motivation for the study and the contribution of the work to literature and or knowledge. The second chapter gives a general overview of both the Nigerian economy and the African continent. It highlights the peculiar situation of these areas, and serves as a prelude to premises used in this thesis. This chapter also discusses the theoretical foundations for the finance-growth nexus and justifies inclusion of variables used in the study along with the expected sign for the coefficients.

The third chapter, which is the first empirical study, discusses the effect of bank credit (proxy for financial development) on economic growth in Nigeria. The chapter emphasises the type of causal relationship that exists between the two variables. I examine the importance of trade (proxied by exports) along with the factors that are necessary for enhancing financial development. The chapter concludes with policy recommendations that could be useful in reversing the current scenario.

The fourth chapter constitutes the second empirical paper. Although this chapter is very similar in concept to chapter three, it has a much broader contribution in that it examines Africa as a whole. It also utilises a different methodology. The paper analyses the abilities of financial institutions to generate economic growth with a specific focus on causality. Similar to the first paper, I examine the factors that mobilise financial development and the role of trade in the relationship. The result is close to our observations in the first empirical paper.

In contrast to King and Levine who pool heterogeneous economies with respect to income, which generated criticisms of their findings, I contribute to the literature by grouping countries in terms of (i) income and (ii) region. Another critique of King and Levine is their non-inclusion of money outside the banking system. I contribute here by testing the omission and find that it is indeed valid. Whereas King and Levine use a cross-country study, I utilise a dynamic panel, which accommodates endogeneity

between finance and growth. This adds value to the literature because the use of panel data increases the degrees of freedom by adding variability to the time series dimensions; allows for control of the unobserved country-specific effects and thereby reduces bias in the estimated coefficients (Habibullah and Eng, 2006). The panel estimator controls for the potential endogeneity of all explanatory variables by using lagged values of the explanatory variables as valid instruments (Levine *et al*., 2000). The small number of time-series observations is not important given that all the asymptotic properties of the GMM estimator rely on the size of the cross-sectional dimension of the panel (Beck *et al*., 2005). Finally, when the number of cross-sectional units is much larger than the number of time-series periods, the non-stationarity problem commonly seen in time-series data can be reduced (Holtz-Eakin *et al*., 1988). Moreover, as a further robustness test, I apply OLS to the equation and find my results to be invariant

The result of the first and second empirical chapters points to the need to examine the efficiency of the financial sector (proxied by deposit money banks). Thus, the third empirical chapter focuses on the efficiency of the banking sector. In this thesis, I adopt the Stochastic Frontier Analysis (SFA) to analyse the level of inefficiency. I conclude in the sixth chapter with a summary of the thesis, recommendations, policy implications, and suggestions for further research.

CHAPTER TWO

THE FINANCIAL SECTOR AND ECONOMIC DEVELOPMENT IN AFRICA: RECENT TRENDS

1.0 Introduction

A lack of strong institutions impedes the channelization of resources and this may account for one of the reasons why the level of poverty is high within the African continent. The importance of institutions as one of the tools for development has been widely discussed in literature (Sindzingre, 2006; North, 1990 and Adebiyi & Babatope-Obasa, 2004). The basic inference is that countries with strong institutional framework are in a better position to develop while a lack of or weak institutions serve as a bane to development. This implies that the government needs to place significant emphasis on strengthening institutions in Africa to ensure their relevance for nation building. A part of motivation for this study is to draw policy recommendation that will address the situations.

2.1 Institutional Framework

In a study of development, the concept of institutions is of prime importance to any economy, though viewed from several perspectives. According to Nissanke and Sindzingre (2006), economists have reached a consensus that institutional environment constitutes one of the most important conditions for economic growth. Adebiyi and Babatope-Obasa (2004) posit that institutions matter and have a direct impact on growth. Institutions can lead to an increase in investment, a better management of ethnic diversity and conflicts, better policies and increase in the capital stock of a community.

Jutting (2003) argues that institutions prohibit, permit or require specific type of action such as political, economic or social that are important for reducing transaction costs, for improving information flows and for defining and enforcing property rights. He classifies institutions based on four areas of analysis namely:-

- economic institutions
- political institutions

- legal institutions
- social institutions

Williamson (2000) in the context of Africa describes institutions as a concept that embodies organisational entities, procedural devices and regulatory frameworks. He uses a classification that makes use of four hierarchical levels where the higher level imposes constraints on the lower level while feedback exists from the lower level to the higher level. According to Williamson, level one consists of traditions, norms and culture, which are highly informal, but transcends several generations within the environment. Level two consists of formal rules used in defining property rights. Level three relates to the rules that defines the governance, private structure of a country and contractual relationships while level four relates to allocation mechanism such as rules used for resource allocation etc.

The above analysis lends credence to the effect of institutions on growth can be positive or negative. It is widely accepted in the literature that weak institutions do not promote growth. The study by Nissanke and Sindzinre (2006) attributes institutional weakness as a major factor for the Sub-Saharan Africa failure to achieve the Millennium Development Goals and for the level of poverty and high inequality ravaging the continent. Aghion et al (1999) suggests that inequality is a deterrent for growth as it reduces investment opportunities, worsens borrowers' incentives and generates macroeconomic volatility. According to Thorbecke and Charumilind (2002), political economy theories link greater inequality to reduced growth operate through the following sub-channels

- unproductive rent seeking activities that reduce the security of property
- the diffusion of political and social instability leading to greater uncertainty and lower investment
- redistributive policies encouraged by income inequality that impose disincentives on the rich to accumulate resources
- imperfect credit markets resulting in underinvestment by the poor, particularly in human capital
- a relatively small income share accruing to the middle class – implying greater inequality, which has a strong effect on fertility, and this in turn, has a significant and negative impact on growth.

The above points apply to the situation in Africa in relation to the financial sector. According to the study by Beck et al (2005), the adoption of the IMF Structural Adjustment Programme (SAP) by some of the countries, and the subsequent liberalisation of the financial sector gave ample room for arbitrage opportunities and rent seeking for the financial institutions. As a result, credit to the private sector and total deposit relative to gross national product shows a declining trend over time; financial sector channels increase arbitrage and rent seeking activities rather than financial intermediation.

Several studies have classified the financial sector in the African continent as undeveloped. Reinhart and Tokatlidis (2003) conducted one such study and classified the financial sector as less advanced. Due to the structure of studies in this work, which initially looks at the Nigerian economy before subsequently researching into the African continent, I will examine first the institutional framework in Nigeria.

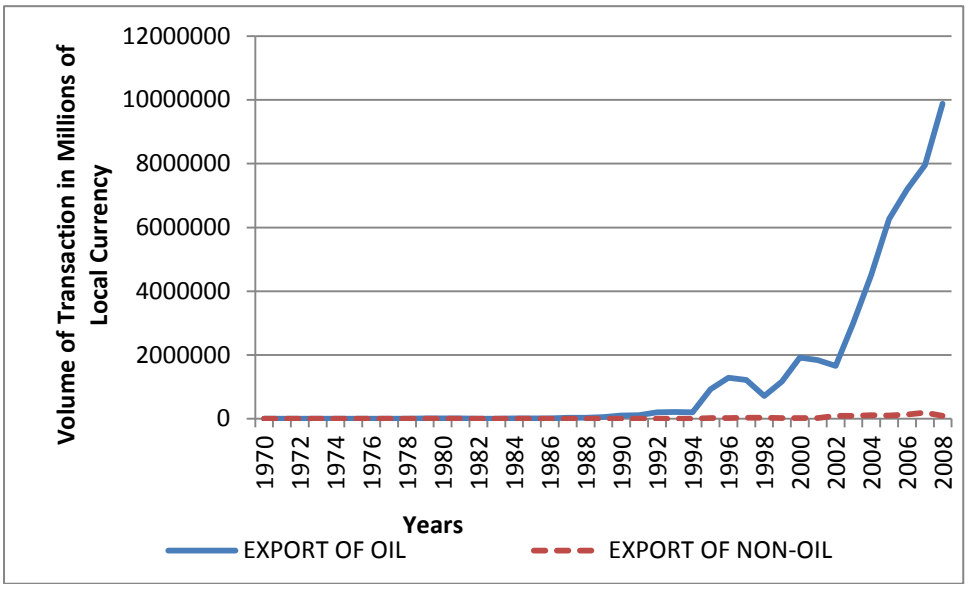
2.2 The Nigerian Economy and Institutions

Nigeria is a country with about 150 million people, which represents about 20% of the African population. Similar with other African countries, Nigeria has an abundance of natural resources including large oil reserves. The country is the eighth largest exporter of oil in the world and an influential member of the Organisation of Petroleum Exporting Countries (OPEC). The country shows positive signs towards improving the level of development (IMF, 2008). As the country moves to becoming an emerging market (IMF Article IV), the importance of the financial sector in ensuring that they are placed to harness positively the gains from the current reforms and to ensure continued development within the sector cannot be over-emphasised.

Adebiyi and Babatunde-Obasa (2004) argue that inefficient institutions in Nigeria encourage corruption and capital flight. By classifying institutions within the economy into exogenous and endogenous areas, they conclude that informal institutions do not integrate properly within the framework of government policy. This explains why policies fail because of improper integration between formal and informal sector.

A relevant case is the discovery of crude oil in the country and the subsequent economic trend. The discovery of crude oil in the early 70's has had significant effect on the growth of the economy. Consequently, there has been large increase in the GDP base of the country with a shift in the export base of the country from a multi product and agrarian economy to a mono product and oil exporting economy. The increase in government expenditure and level of corruption made many farmers forgo farming and search for better living standard in the cities. Subsequently, the government attempted to reverse this trend have not been successful to date. The graph below shows the country's export of oil and non-oil items from 1970 to 2008. Oil exports is the main source of revenue for the country most especially from the 1990's until date while non-oil export does not show any remarkable change.

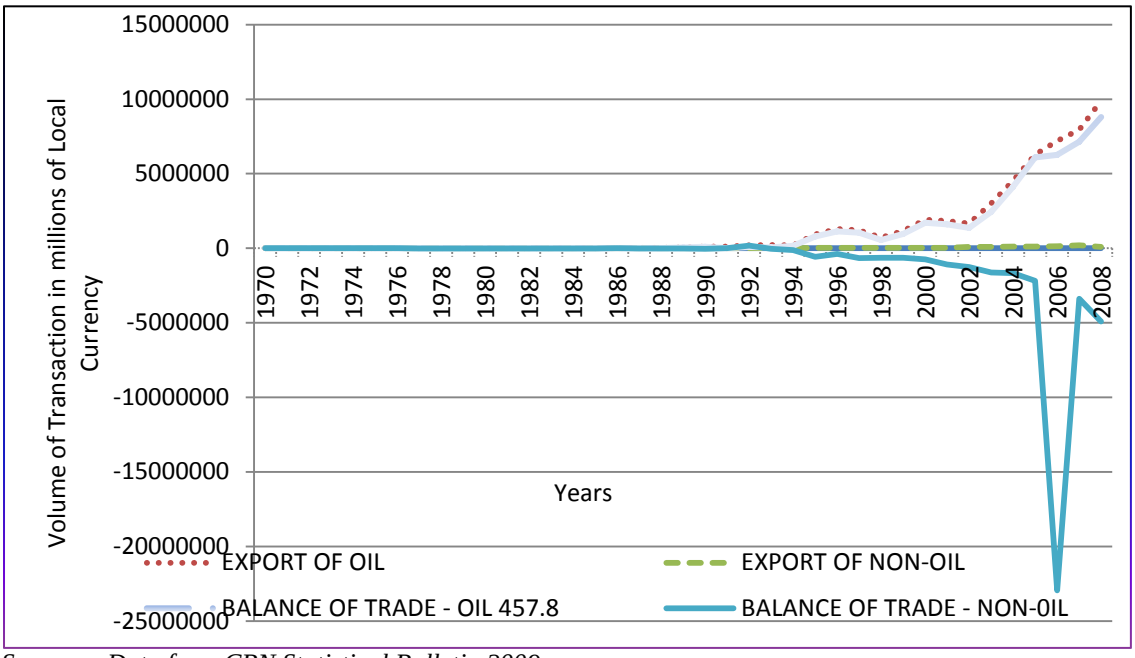
Figure 2.1: Export of Oil and Non-Oil from Nigeria (1970 – 2008)



Source: - Data from CBN Statistical Bulletin 2009

The situation also permeates the balance of trade for oil and non-oil. The balance of trade in non-oil continues to deteriorate each year. It has been negative since 1994 with a declining trend until date. Despite this scenario, the country is not poised to change this unfortunate trend.

Figure 2.2: Total Exports and Balance of Trade for Oil and Non-Oil in Nigeria



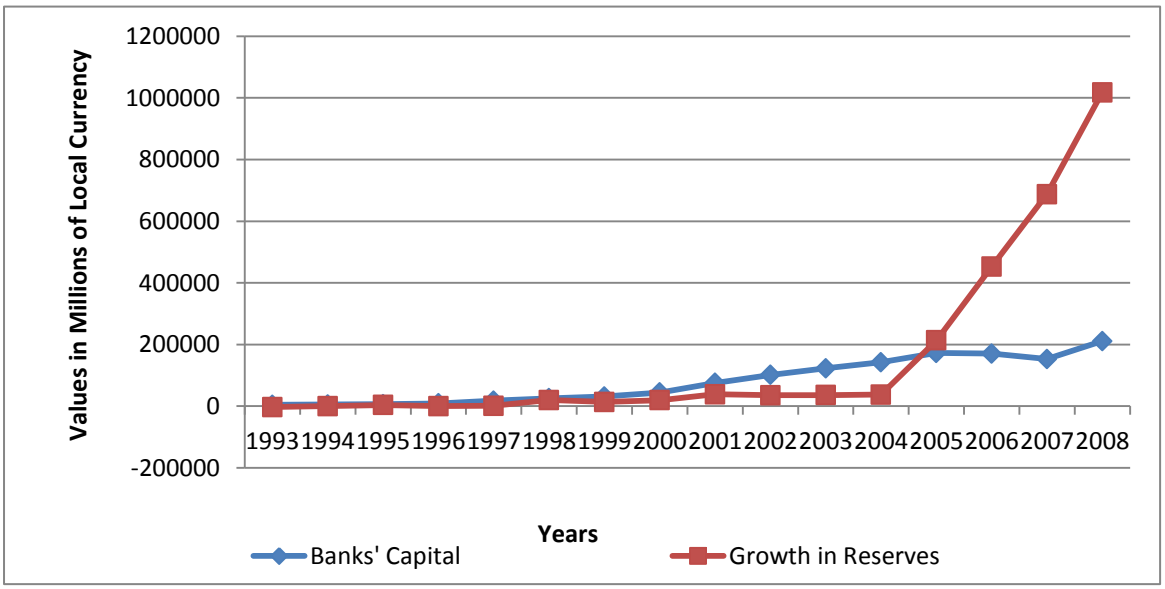
Source: - Data from CBN Statistical Bulletin 2009

Over time, the country has turned into a public sector driven economy with most citizens looking to the government for virtually all aspects of their welfare.

Financial institutions follow a similar trend. Banks in the country try to favour short-term funds, which only limited people can readily access due to the bottlenecks involved in registering mortgages on the assets. Most borrowers have no real assets to offer as collateral. This makes real assets unattractive to banks due to the difficulties they encounter in registering mortgages quickly. For example, if a borrower wishes to use a property as collateral, the bank will need to go through a lengthy and bureaucratic process before it can register a mortgage. When they are eventually registered, there are loopholes in taking possession upon default which may make it difficult to exercise right of foreclosure. Thus, banks have little motivation to issue credit backed by real assets.

These institutional and bureaucratic failures structurally impede competition in the domestic loan market. Consequently, banks in Nigeria make huge returns as shown in Fig 2.3 below. The graph depicts the amount of capital and change in reserves over a period of fifteen years and suggests that banks keep a significant amount in the form of retained earnings in proportion to their capital base.

Figure 2.3: Nominal Banks' Capital and Growth in Reserves in Nigeria

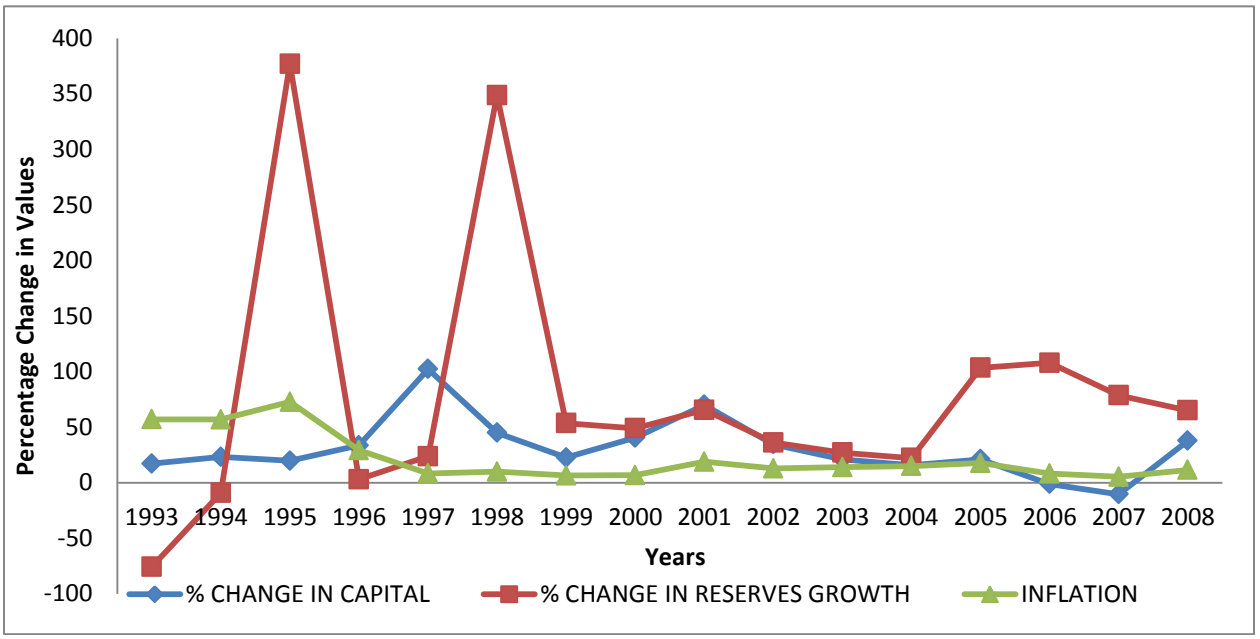


Source: - Data from CBN Statistical bulletin 2009

The growth in reserves is almost the same as the total capital of the banks. This growth has not taken account of other sources that they allocate profit to which may be more than their current capital base annually. Unlike developed economy banks, Nigerian banks are engaged in qualitative asset transformation to generate their earnings in the form of interest income.

It may be possible to adduce the growth in reserves of these banks to inflation rate, more so, that the country's rate of inflation has been volatile over the years ranging from 5% to 72%. In order to analyse this situation, the next chart (Fig. 2.4) presents the percentage change in both capital and reserves along with inflation rate over the same period. The graph shows wide disparity between the percentage change in reserves growth and the inflation rate, but the relationship between percentage changes in capital and prices rate is not as dispersed. The effect of inflation in the relationship between capital and reserves growth has not been significant. Inflation cannot explain the wide variance in the growth of reserves.

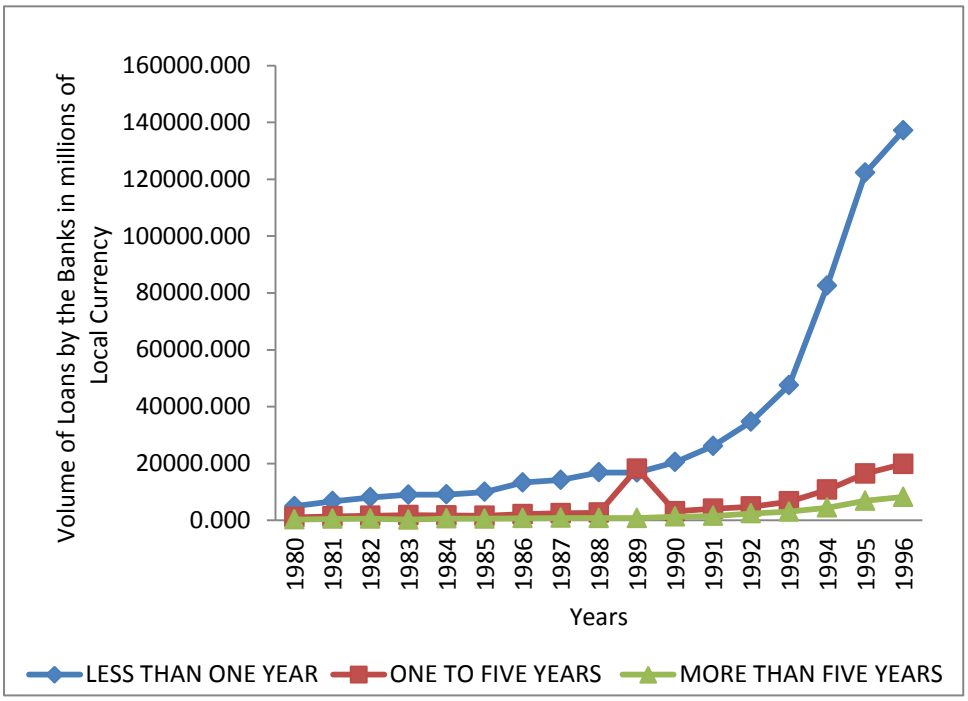
Figure 2.4: Percentage Changes in Nominal Banks' Capital and Reserves with Inflation Rate



Source: - Data from CBN Statistical bulletin 2009

Similar to this is the capital base for each of these banks which prior to 2007 was ₦500 Million (equivalent of about £2.2 million). This low capital base is not making the banks competitively positioned for cheaper and longer tenured funds globally while funds within the country are short tenured. One factor responsible for availability of short tenured funds within the country is the hitherto undeveloped pension fund sector and others in that category where the banks can source for long-term funds. As a result, banks in the country engage in short term intermediation, which largely may not support growth for an adequate result. The chart (Fig. 2.5) below reveals the maturity structure of bank loans between 1980 and 1996 (date limited because requirement for such disclosure was abolished since 1996). Bank loans with less than one-year maturity increased over the period with significant rise from 1990. Other types of loans do not give any remarkable change.

Figure 2.5: Maturity Structure of Bank Loans in Nigeria

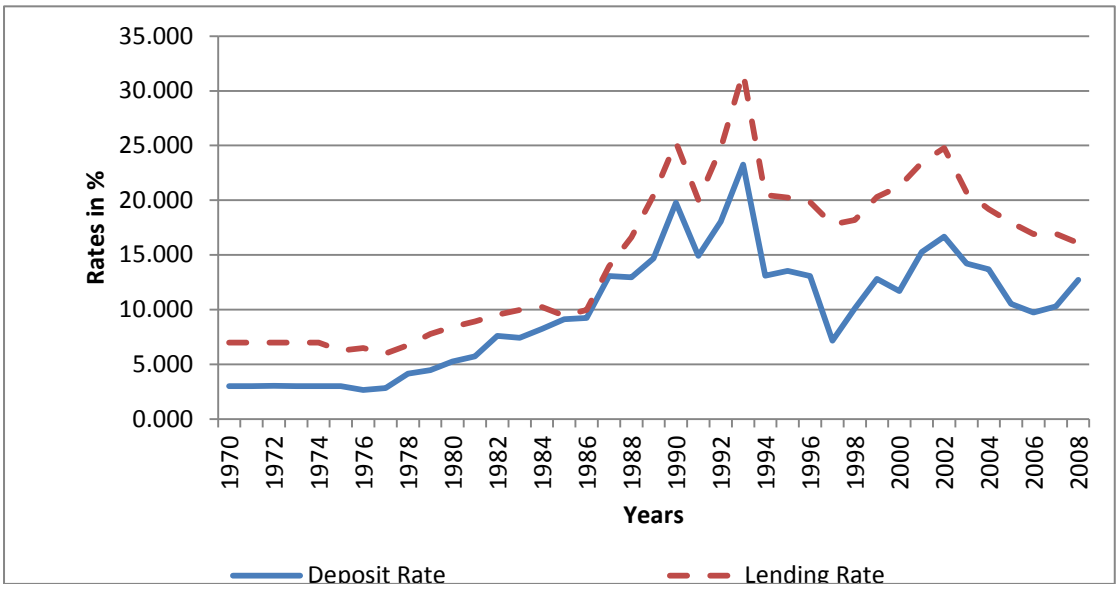


Source: - Data from CBN Statistical Bulletin 2006

Likewise, the high cost of credit is a bane for efficient performance of the intermediary role while the gap in deposit and lending rates also dissuade credible requests from clients. Osinubi and Akin-Olusoji (2006) suggest this is why the contribution of real sector to GDP, which hovers around 45% and 51%, did not increase over the years. It is a deterrent for this growth-promoting sector of the economy.

Fig. 2.6 below reveals that the gap between deposit rate and lending rate is about 5% and sometimes as high as 10% except around 1986 and 1989 when the gap was minimal with a bit of convergence in between.

Figure 2.6: Deposit and Lending Rates in Nigeria



Source: - Data from CBN Statistical Bulletin 2009

All these factors are hindrances to availability of funds by genuine businesses in the country. A credible investor will establish his ability to repay the high cost of funds. The situation may also result in information asymmetry and moral hazard as credible investors will not take the funds. Banks will therefore give the money to high-risk customers who may not eventually repay the funds.

Generally, several research findings on institutions correspond to the institutional framework in Nigeria. Though the financial system is currently under-developed, in view of the recent reforms, the system is on the route to being an emerging market. It needs to manage properly the observed lapses to harness the gains that occasion the scenario within the system.

2.3 Financial Institutions in Nigeria

The Financial Institutions in Nigeria can be broadly categorised into Banking System and Capital Market. The Banking sector has the Central Bank of Nigeria and the Nigeria Deposit Insurance Corporation as regulators within the system. The Financial Institutions consists of Deposit Money Banks, Discount Houses, Development Finance Institutions, Primary Mortgage Institutions, Finance Companies, Micro-Finance Institutions, and Bureau De Change. However, the deposit money banks (DMB) dominate the sector and account for a large volume of transactions within the system

2.4 The Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC)

The CBN came into existence through the 1958 act of parliament with six amendments in 1991, 1993, 1997, 1998, 1999 and the latest in 2007. Before 1958, there was agitation by the banking populace to have the banking institutions regulated due to the spate of bank failures that characterised the banking scene then. Thus, the period of 1892 to 1952 is the time used to investigate banking practise in Nigeria and establish the need for a regulatory body. A report produced by G. D. Paton committee[3] formed the basis for the first banking ordinance of 1952. This report culminated in draft legislation to the House of Representative in March 1958, the enactment of the CBN act in 1958 and the subsequent emergence of CBN on 1st July 1959.

Subsequently, the government promulgated a banking decree in 1969 which required the incorporation of all banking institutions in the country and equally established the minimum amount of capital acceptable for licensed banks. The minimum capital requirement depends on total deposits. It also empowered the CBN to set the structure of bank interest rates, with particular emphasis on the minimum deposit rates and minimum and maximum lending rates, with priority sectors (e.g. manufacturing, agriculture, etc) subject to preferential lending rates (Brownbridge, 1996). This decree along with the CBN act forms the basis of legal framework with which the CBN regulates the financial institutions in the country

In the later part of the 1980's, which coincides with the era of bank liberalisation, many financial institutions sprang up and interest rate was as high as 70%. In view of this, the government set up an enabling control through the Banks and Other Financial Institutions decrees No 24 and 25 of 1991. This decree repealed the banking act of 1969 with the objective of strengthening and extending the powers of the CBN to cover

[3] A committee of enquiry set up in 1948 led by G. D. Paton to investigate and ensure sound banking practice in Nigeria. The activities of this committee paved way for the establishment of the Central Bank of Nigeria.

the new financial institutions that are springing up and enhance the effectiveness of monetary policy, regulation, and supervision of banks as well as non-bank financial institutions. The CBN has limited autonomy with this decree. However, in 1997 another decree was promulgated which repealed the 1991 BOFI Decrees and was replaced by the CBN (Amendment) Decree No 3 and BOFI Decree No 4 of 1997. These decrees completely stripped the CBN of her limited autonomy and made her responsible to the Federal Ministry of Finance. The action generated widespread criticism both from within the country and beyond thus by 1998, the decrees were replaced with CBN (Amendment) Decree No 37 and BOFI Decree No 38 of 1998 where the bank was given wider operational autonomy to carry out their functions. The BOFI (Amendment) Decree No 40 of 1999 aims at addressing the issue of distress by non-bank financial institutions so that the CBN will be legally empowered to handle such matters.

The latest of the amendments in 2007 gave the CBN full autonomy and included price stability as one of the objectives of the bank as well as rendering economic advice to the Federal Government.

This institution has statutory mandate comprising of

- Issuance of legal tender
- Maintenance of external reserves
- To safeguard the international value of the legal tender currency
- To act as banker and financial adviser to the federal government

Based on the above statutory mandate, the CBN performs the following duties

- promotes and maintains monetary stability along with sound and efficient financial system
- act as lender of last resort to banks
- maintains the country's external reserves
- act as banker and financial adviser to the federal government

To perform its supervisory function, the CBN comprises of two departments namely Banking Supervision department and Other Financial Institutions department. The "banking supervision" department is charged with the supervision of the deposit money banks and discount houses while "other financial institutions" supervises the primary mortgage institutions, finance companies, micro-finance institutions and bureau de change. Supervision takes place via on-site and off-site methods. Despite this, the supervisory effort is still inadequate and deserves a review in order to meet up with the monetary and financial stability challenges (IMF 2008). They believe is necessary to support the current reforms within the sector, which focuses on making the Nigerian banks globally competitive and developed (comparable to other financial markets in the developed and emerging markets).

Presently, the current regime of the bank has introduced several reforms such as

- Increase in the capital base for each of the deposit money banks to ₦25 Billion (equivalent of about £110 million) in 2007.
- Creating a market for consumer finance and micro credit by empowering the hitherto community banks now called micro finance institutions.
- Creating and developing a market for long term debt instruments such as asset-backed securities, corporate bonds etc
- Syndication of large deals in the oil & gas sector and other sectors of the economy.

2.5 Deposit Money Banks in Nigeria

The deposit money banks in Nigeria have gone through several phases that many scholars' classify in various ways. According to Inanga and Soyibo (1989), they classify the history of Nigerian banking into four phases:-

- the era of relatively stable banking environment (1894 – 1952)
- the first banking boom era (1952 – 59)
- the era of regulation (1959 – 86)

- the era of deregulation (1986 – 1992)

The latest phase is the era of consolidation, which coincides with the administration of the current governor of the bank (2004 to 2009).

The Nigerian Banking system prior to 1952 was dominated by the foreign banks namely African Banking Corporation which later changed its name to Standard bank and subsequently First bank of Nigeria Plc; the colonial bank, changed to Barclays bank and now Union bank Plc; the British and French bank presently called United bank for Africa plc. The banking institutions then favoured well-established customers who were majorly foreigners, thus the growth of demand deposit is slow due to a penchant for cash transaction (poor banking habit). This, they assume is a result of the perceived discrimination against indigenous businesses in the allocation of funds. This assumption is widely acclaimed as the reason why indigenous people wanted to have their own banks. Thus in 1929, the first indigenous bank was set up called Industrial and Commercial bank. Unfortunately, the bank collapsed within one year of establishment. In 1931, another indigenous bank called Nigerian Mercantile bank was established, which also collapsed in 1936. However, on the 11th February 1933, National bank of Nigeria was established and remained the only functional indigenous bank until 1937 when African Continental bank was established and subsequently in 1945 Agbonmagbe bank, which later changed its name to Wema bank started operations. Several banks established during this era collapsed due to inadequate capital, inefficient and incompetent management.

The second phase started with the enactment of the first banking legislation called banking ordinance in 1952 when there were only two indigenous banks namely National Bank of Nigeria and African Continental Bank. Subsequently, indigenous entrepreneurs started banks to bridge the gap of finance availability for local investors. These banks were largely undercapitalised comparatively hence could not compete with the already established banks in operation then. Similarly, regulation does not exist then, as there was no regulatory institution in place while most of the owners of the indigenous banks do not have information about the procedure for operating the banking firm.

According to Nwankwo (1985), four main features characterised this period:-

- The implementation of the Paton commission report in the 1952 ordinance which came into effect in 1959
- The collapse of the indigenous banking boom
- The absence of new banking establishment
- The absence of Central Banking or lender of last resort

In accordance with Nwankwo's classification, many banks collapsed during this era. Many of the established indigenous banks failed with evidence of failure before business operation commenced.

The third phase started with the emergence of the central bank in 1959. Her presence did not initially bring appreciable change to the industry because most operators were ill equipped as they were not trained in the development of financial institutions hence could not prevent large scale bank failure that occurred in the early part of the era. However, the situation improved as new banks were established. According to Soyibo and Adekanye (1992), between 1959 and 1960, eight new commercial banks were established which brought the total to twelve and subsequently seventeen by 1962. To stem the tide of foreign control of banks, the government promulgated the indigenisation decree in 1969, which made it mandatory for any business entity to have local investors contribute not less than 40%. The percentage was later increased to 60% with the revision of the decree in 1977. Consequently, the government acquired controlling ownership shares in the three largest banks earlier mentioned.

Unlike in Britain where monetary policy is independent, as far back as the early 1960's, the Central Bank of Nigeria (CBN) had the power to regulate and thus control credit expansion. In 1969, another banking decree was enacted which empowered the CBN to specify the minimum and maximum lending rates noting the preferred sectors for preferential lending rates. Thus, the CBN armed with this weapon started to influence the direction of credit which they state in the monetary policy report and which became annual from 1969, the minimum percentage to the preferred sectors along with the

maximum percentage to the less preferred sectors. According to Adebiyi and Babatope-Obasa (2004), the government adjusts interest rates periodically to promote increase in the level of investment in the different sectors of the economy. For example agriculture and manufacturing sectors were accorded priority, and the commercial banks were directed (by the central bank) to charge a preferential interest rates (vary from year to year) on all loans and advances to small-scale industries. By 1974, the major objective of monetary policy was to stimulate output and employment, attain internal and external balance of payment within the economy. The CBN started imposing interest rate and credit ceiling on the deposit of banks. Currently, the government of Nigeria is pursuing a market-determined interest rate regime, which does not permit a direct state intervention in the general direction of the economy.

A major policy used by the CBN was the sectoral credit guidelines, which targeted the direction and cost of credit. The prescribed lending rate for the preferred sector was lower than the CBN determined rediscount rate albeit being contrary to the market-determined rate. The aim of lowering the rate of interest for the preferred sector was to make their cost of borrowing appealing to the banking public to encourage them to obtain credit for the specified purposes thereby enhancing production in those areas.

To ensure compliance, the CBN usually attach penalties such as transfer of shortfall in lending to the priority sectors to a specified account with them for erring banks. Often banks prefer this course of action rather than lending to the priority sectors. Several other forms of credit direction such as moratoriums for agricultural loans and the agricultural credit guarantee scheme did not change the position of banks. The effectiveness of this policy was therefore limited. Banks prefer to examine critically their customers to minimise risks associated with adverse selection and moral hazard in the process of determining their credit worthiness.

The global trend in the world crude oil market in the mid 1980s when price of crude oil, fell from US$40 to US$14.85 in 1986, resulted in serious economic imbalances within the economy. Subsequently, the country adopted the IMF Structural Adjustment

Programme (SAP). This necessitated financial sector reforms allowing free entry and free exit along with the use of indirect instruments for controlling the banking industry.

The era of bank deregulation describes the phase of liberalisation. During this period, the government eased restrictions on the establishment of financial institutions, thus many banks, finance houses and primary mortgage houses were established. This era also coincided with the period of the introduction of Structural Adjustment Programme (SAP) and it featured certain specific actions namely:-

- The introduction of the second tier foreign exchange market
- The deregulation of interest rate
- The establishment of Nigeria Deposit Insurance Corporation (NDIC)
- Increase in the minimum paid up capital from N10 million to N20 million for banks.
- The establishment of People's bank of Nigeria by the government is to ensure easy access of the low-income groups to funding and to address grassroots mobilisation of savings.
- The introduction of Community banks in 1990. This are to operate as unit banks dealing in minor banking operations, known as micro-finance institutions.

As stated earlier, the government licensed several banks, thus Soyibo and Adekanye (1992) reports that between 1986, and May 1989, 38 new commercial and merchant banks took off while 25 others had licences to start operation before the end of that year. Thus by 1990, the number of banks had increased to over 105 while 20 more are expected to start their business before the end of that year. The increase in the number of banks resulted in unprecedented competition within the sector with rates as high as 70% while the concept of arm chair banking (sellers market) gave in to a customer centred, seeking and focused approach (buyer's market), seen as a positive outcome of the restructuring occasioned by SAP.

To ensure financial soundness, the CBN in 1990 issued the prudential guidelines. This required banks to classify loans according to whether the customers service the account (i.e. payment of interest and principal is up to date). It also required them to make provisions for non-performing loans with the percentage of provisioning dependent on the duration of time that it has been none performing; suspend unpaid interest from income; classify them and make appropriate provisions for off balance sheet engagements.

By 1992, many banks already had large portfolios of non-performing assets. Eventually, many banks could not survive the period and according to Ayadi et al (1998), 16 banks were classified as distressed in 1992, twenty-nine in 1993 and over thirty in 1994. The reasons given by both CBN and NDIC were: general economic recession, policy induced shocks, increase in the level of risks assumed by banks, poor quality of loans, mismanagement and fraud. Thus, by 1998, twenty–six banks made up of thirteen commercial and thirteen merchant banks had their licenses revoked.

In order to strengthen the banks and act as a support for the era of banking reform, the 1991 Banks and Other Financial Institution Decree (BOFID) was enacted which replaced the 1969 Banking Act. This legislation did not alter previous ability of the CBN thus, they continued with previous directions concerning credit. It strengthened the legislative powers of CBN who thereafter assumed sole responsibility for licensing banks and enforcement of banking laws. The CBN puts several reforms in place including the latest recapitalisation of the banks, which according to the CBN will make Nigerian banks more competitive with the current globalisation. This legislation mandated all banks to increase their share capital to ₦25 Billion (equivalent of over £100 million) each. The compliance with this directive reduced the number of banks to twenty-five banks

Prior to 1996, the financial system witnessed rapid growth mostly from 1985 to 1996. The economy hinges on increasing revenue from the oil sector, high imports, and large fiscal deficits. Thus to curtail inflation and ensure economic growth, monetary instruments such as credit ceilings, reserve requirements, special deposits, selective

credit control, nominal interest and exchange rates were employed. The under-developed nature of the financial system prevents the realisation of many results from the sector. The most widely reported monetary instrument was sectoral credit allocation, which aimed at stimulating the productive sectors, and reduce the inflationary trend within the economy.

Adebiyi and Babatope-Obasa (2004) attribute the non-compliance with the sectoral directives by the deposit money banks to the perceived risk in increasing credit to these sectors, which they viewed as not justified in terms of risk and cost. They postulated that the high risk arises from difficulties in obtaining information on a firm's true financial condition and performance coupled with weak and inefficient institutions, which makes it difficult for banks to enforce contracts. In conclusion, they opined that the business environment in Nigeria is very risky and uncertain coupled with poor infrastructural facilities necessary to bring about substantial reduction in the risk associated with financing an extremely traumatized economy. The above scenario is widely believed as reasons why the directed credits failed to achieve the desired targets hence their implementation became less effective over time.

The failure of credit allocation created a lot of excess liquidity within the system hence in 1986 the government reduced the sector specific credit allocation targets to four and eventually abolished it in 1996. The four sectors that are mostly favoured by the sectoral credit allocation are Agriculture; Mining; Manufacturing and Export while they classify other sectors such as import, transport and communication, real estate etc as miscellaneous. However, excess liquidity continued to be a problem facing the banks while the CBN continues to adopt various strategies to overcome the trend. Despite abolishing sector specific credit allocation, subtle methods have been in use with a view to influence the direction of credit within the economy e.g. in 2003, credit availability to the real sector was encouraged through Small and Medium Industries Equity Investment scheme (SMIES) with a promise of reducing cash reserve requirement for banks that allocate 20% or more of their portfolio to the sector. In essence, sectoral credit allocation still subsists, but merely through subtle method/ approach, they only abolished the fiat approach. Overall, the government appreciates credit function of

banks as a growth-promoting instrument, which they tried to use to propel growth within the economy.

2.6 Systemic Distress

From the inception of the indigenisation decree of 1969, government ownership of banks was a common feature in the Nigerian banking system. Most banks had government investment as high as 60% while some states set up banks of their own. A critical feature of this situation is that the board of such banks cannot exercise good corporate governance as they often sacrifice good business judgement on the altar of political exigencies or good patronage. This assertion is similar to the postulation made by Demirguc-Kunt and Levine (2008) that privatisation tends to improve performance over continued state ownership. They suggest that government do not have comparative advantage of owning financial institutions.

According to Beck et al (2005) government owned banks performed significantly worse in terms of profitability and loan portfolio quality than privately owned banks. By 1990's the financial had systemic crisis resulting mainly from loans to government leading to a loss of about N5 billion (about £22 million) by banks from such loans. This scenario is due to government political influence in banks where they have controlling shares, which prevents appropriate prudential action by the management.

To this end, the CBN in 2005 restricted government ownership in banks to 10% of total shareholding of any bank. Where government investment in any bank is currently above 10%, such a limit should not increase while efforts are in place to reduce to the stipulated percentage by 2007. This directive was boosted with the recent recapitalisation of all banks to N25 billion (about £110 million) each. Deposit money banks in the country reduced significantly from 86 to 25 because the government (CBN) liquidated all the banks that failed to meet up with the mandatory increase in capital were liquidated. The banks also sought for investible funds through the capital market.

2.7 Other Financial Institutions

As earlier mentioned, there are other categories of financial institutions within the country, but the deposit money banks still dominate the system. Many of the other financial institutions do not have data on them hence difficult to include them in our empirical analysis.

2.8 Current Financial Trends within the Country

The 2008 IMF Article IV Consultation with Nigeria posited that the recently recapitalised banks are in a better position than before due to the need to generate returns on their much increased capital base. Returns are currently low and the deposit money banks try to improve this by -

- Expand credit to the private sector which doubled within two years ago when the consolidation started
- Participate in large credits to needing sectors such as the oil and gas, communication and also explore infrastructural financing
- Expand retail credit identification of customers through corporate relationship
- Increase in treasury activities and attempt to develop new products similar to the developed and emerging economies
- Universal banking continues to thrive because more than half of these banks have insurance and securities subsidiaries and some engage in regional expansion involving cross-border activities
- The banks wrote off a significant proportion of non-performing loans and standard stress tests show that the sector is currently resilient to most quantifiable shocks.
- However, intermediation ratios are still low with M2 to GDP at 21% and Private Sector Credit to GDP at 19%; this they expect to improve, subject to prevailing conditions subsisting over time.
- Growth within the sector is yet to translate into funding long-term productive investment and better access to finance for small and medium scale enterprises. This is because Private Sector Credit to Gross Domestic Product was 19%.

Consequently, they describe the Nigerian Banking System as improving, but will need proper monitoring and research to prevent deterioration within the sector.

2.9 The African Continent and Institutions

Africa consists of fifty-four (54) countries, most of whom they classify as under-developed. These countries at various times in the past had their legal origin from mainly three countries. These are Britain, France and Portugal. Many of these countries had history of long battle for independence and this is sometimes the reason adduced for the relative backwardness of the continent. Sequel to their independence, many African countries are known to have gone through years of wars either civil or with neighbouring countries. All these played a role in the level of development within the continent.

Figure 2.7 -MAP OF AFRICA

Source: - [*http://www.freewebs.com/maphorisa/mapofafrica.htm*](http://www.freewebs.com/maphorisa/mapofafrica.htm)

Presently, the continent is the least developed in the world with about twenty-five of these countries ranking high in the list of impoverished countries in the world. One reason attributable to the level of poverty in Africa is the level of corruption. It is practically difficult to transact a genuine business without having to grease the palm of the officials. This to some extent widens the gap between the rich and the poor with some individuals even said to be wealthier than their country. Table 2.1 below highlights some details about some of the countries that are included in the empirical analysis.

Table 2.1 -Economic and Financial Highlights of Some African Countries in 2005

Country	World Bank Income Group	Popu-Lation in Millions	GDP per capita	GDP per capita growth (%)	Liquid Liabilities / GDP	Private Credit by Deposit Money Banks / GDP	Currency Outside Banking System / Base Money	Deposit Money Bank Assets / GDP
Algeria	L M	32.9	3114.95	3.53	0.48	0.10	0.32	0.33
Angola	LM	16.6	1843.37	17.11	0.12	0.04	0.28	0.07
Benin	L	7.9	544.95	-0.45	0.24	0.15	0.39	0.16
Botswana	UM	1.8	5725.96	3.49	0.28	0.19	0.09	0.20
Burkina Faso	L	13.9	389.52	3.09	0.19	0.14	0.43	0.15
Burundi	L	7.4	107.87	-2.05	0.26	0.19	0.37	0.22
Cameroon	LM	17.8	932.15	0.07	0.16	0.09	0.29	0.11
Cape Verde	LM	0.5	2107.85	4.87	0.73	0.40	0.26	0.57
Cent. Afr. Rep	L	4.2	322.09	0.73	0.16	0.06	0.47	0.08
Chad	L	10.1	578.90	4.36	0.07	0.02	0.45	0.04
Congo, Rep.	LM	3.4	1781.56	5.31	0.13	0.02	0.35	0.03
Côte d'Ivoire	L	19.2	850.27	-0.87	0.23	0.13	0.44	0.16
Egypt	LM	77.1	1162.41	2.53	1.00	0.49	0.23	0.81
Ethiopia	L	74.7	164.80	8.95	0.46	0.18	0.28	0.28
Gabon	UM	1.4	6328.91	1.02	0.16	0.07	0.36	0.10
Gambia, The	L	1.5	302.26	2.01	0.43	0.11	0.38	0.23
Ghana	L	21.9	489.17	3.58	0.28	0.13	0.41	0.24
Guinea-Bissa	L	1.5	204.95	-0.19	0.29	0.01	0.44	0.02
Kenya	L	35.6	527.23	3.05	0.38	0.23	0.36	0.33
Lesotho	LM	1.9	694.65	-0.08	0.26	0.06	0.22	0.12
Libya	UM	5.9	7053.32	4.16	0.26	0.08	0.18	0.12
Madagascar	L	17.6	286.05	1.73	0.19	0.08	0.38	0.11
Malawi	L	13.2	215.86	-0.02	0.25	0.06	0.36	0.11
Mali	L	11.6	456.91	2.91	0.29	0.18	0.42	0.19
Mauritius	UM	1.2	5059.01	3.73	1.34	0.72	0.31	1.00
Morocco	LM	30.1	1974.73	1.93	0.97	0.57	0.38	0.73
Mozambique	L	20.5	320.39	5.98	0.25	0.09	0.32	0.16
Niger	L	13.2	251.05	3.71	0.14	0.06	0.43	0.07
Nigeria	L	141	794.08	2.89	0.17	0.12	0.41	0.16
Rwanda	L	8.9	264.57	5.04	0.18	0.11	0.31	0.12
Senegal	L	11.2	770.09	2.89	0.32	0.20	0.40	0.22

Seychelles	UM	.08	10661.2	6.95	1.27	0.31	0.35	1.03
Sierra Leone	L	5.1	237.86	3.44	0.18	0.04	0.43	0.09
South Africa	UM	46.8	5177.84	3.74	0.41	0.65	0.33	0.72
Sudan	LM	38.6	707.67	4.13	0.001	0.001	0.36	0.001
Swaziland	LM	1.1	2244.71	1.35	0.19	0.18	0.32	0.20
Tanzania	L	39	362.54	4.44	0.24	0.08	0.40	0.12
Togo	L	5.9	351.83	-1.31	0.28	0.16	0.41	0.18
Tunisia	LM	10.02	2888.40	2.97	0.58	0.60	0.46	0.65
Uganda	L	28.6	321.43	2.92	0.17	0.05	0.38	0.13
Zambia	L	11.7	609.69	2.81	0.17	0.07	0.26	0.13

Key: - L, LM and UM denotes Low Income; Lower Middle Income and Upper Middle Income Countries
Source – World Bank Development Indicator (WDI), 2007 and Beck et al (2006) database

The above data shows that twenty-four of the forty-one countries included in the table are classified as low-income countries; eleven others falls within the lower middle income countries while six are categorised as upper middle income countries. This confirms the earlier assertion that most of the countries within the continent are classified as low-income countries hence the level of poverty. All the low-income countries exhibit similar features such as very low GDP per capita. The lowest for the group was Burundi, which had 107.87 while Nigeria had the highest, which were 794.08. All these figures are very low and underscore ability for development. It is therefore not surprising to see that the GDP per capita growth for some of the countries namely Burundi, Benin, Cote d'Ivoire, Guinea-Bissau, Malawi and Togo were negative for year 2005. Even Lesotho that falls under the lower middle-income country also has a negative GDP per capita of 0.08. A recent report by the World Bank (ADI; 2008) stated that the GDP of the Sub-Saharan African countries was $744 billion. This is just 28% of China; 69% of Brazil; 74% of Russia and 80% of India. Out of this, Nigeria and South Africa accounts for almost 60% of the sub-regional GDP.

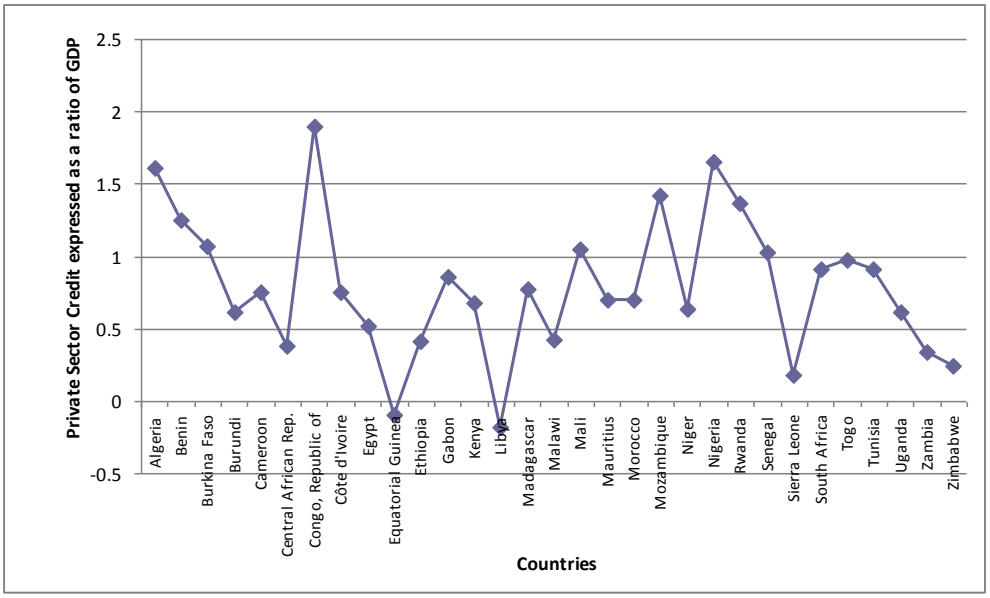
For the financial variables, the observation is not significantly different from what we earlier discuss. Essentially, when we express liquid liabilities as a percentage of GDP, the percentage for Chad is as low as 0.07, Angola was 0.12 while Congo was 0.13. Similar with the exception stated in respect of Lesotho above, Sudan, which is a lower middle-income country, recorded the lowest figure of 0.001 for the whole series. This implies that the spate of under-development transcends the low-income countries, as some of the signs are visible with the middle-income countries. If the postulation of Rioja and Valev (2004) is anything to take into consideration, not less than fifteen (15) of the listed countries had their ratio of liquid liabilities to GDP below the estimated

figure of 0.20. The basic inference is that liquid liabilities may not be contributing significantly to growth in these countries.

The ratio of Private Sector Credit when expressed as a percentage of GDP is not different from the observation in respect of liquid liabilities, rather the situation can be described as somehow worse than it. About twenty-five (25) countries are below the Rioja and Valev (2004) estimated threshold of 0.14 for Private Sector Credit required to exert a meaningful impact on growth. Specifically, sixteen countries are even within the range of 0.001 to 0.08; a range which has the highest figure to be about 50% of the estimated minimum requirement. The basic question is ”How does one expect a positive impact from intermediation, if the bulk of the fund is channelled to non-growth promoting areas of the economy.

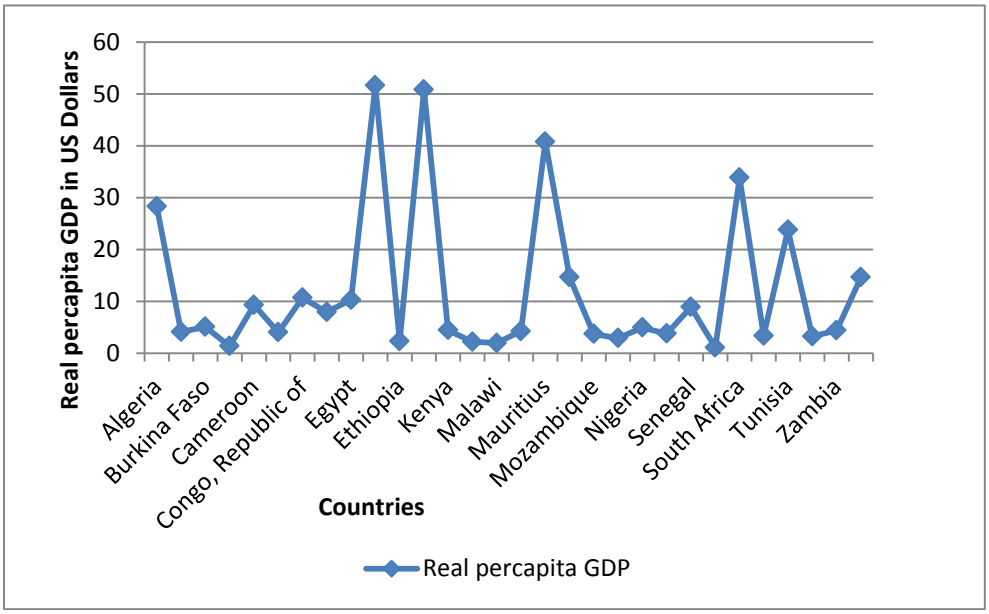
Some countries like Sudan, even though classified as lower middle-income country has the ratio of private sector credit to GDP as low as 0.001 and Guinea-Bissau with 0.01. What is more pertinent is that many countries that are classified as upper middle income countries such as Gabon and Libya; and those that are classified as lower middle income countries such as Algeria, Angola, Cameroon, Congo and Lesotho, all exhibited very poor ratios. This shows that the problem with allocation of credit to the Private Sector transcends the income level, but a peculiar situation with most of the countries within the continent. The chart in figure 2.8 below depicts the aforementioned situation and shows the current volume of credit that is available to the Private Sector by these countries. Where the GDP per capita is large, the ratio of Private Sector Credit to GDP is low as shown in the charts below.

Figure 2: Private Sector Credit as a ratio of GDP for African Countries in 2005



Source: - The World Bank Development Indicator (2007)

Figure 2: Real percapita GDP for African Countries in 2005



Source: - The World Bank Development Indicator (2007)

According to Honohan and Beck (2007), there is still a long way to go for finance to have a desired impact on African countries. This they attributed to limited access by small firms and households to any formal financial services, especially in the rural areas. In accordance with the submission of Honohan and Beck (2007), the size of the

financial system in Africa is relatively small. From the table above, I find that nine of the countries had the assets of their deposit money banks expressed as a ratio of GDP within the range of 10% and below. Some countries like Congo and Chad were as low as 3% and 4% respectively. Only seven countries recorded values above 50%. This shows that the size of the banks within the region is very small and will surely affect the volume of intermediation that these banks could possibly engage in. One reason often adduced for this is the low level of savings. This according to literature is a reflection of the ability to generate deposits and subsequently create credit

For finance to make a meaningful impact, it transcends the above discussion. Honohan and Beck (2007), state that good governance is important for strong financial systems. Where either the economy or the financial institutions (both operators and regulators) downplay the importance of sound managerial practices, the expected effects of the financial activities may not materialise. The recent World Bank report (ADI; 2008) on Africa stated that healthy growth rates is less likely without attention to jobs, governance, infrastructure, regional integration and small and medium scale enterprises. They suggest that such improvements will assist Africa to make meaningful growth over the forthcoming years.

This suggestion is important due to the many vices that associate with the continent, one of which is the high rate of unemployment, that results in brain drain from the continent in the last few decades. Secondly, as stated by Honohan and Beck (2007), the continent has high incidence of occasional economic or political meltdowns, which are because of conflicts, famine and politico-societal collapse. Some countries up until now are still engaged in some sorts of instability that affects the fragility of the economy. Similar to this is the spate of political upheaval within the continent. Many countries have had series of coups because of their political transformation while some do not have democracy rule, but rather military leaders who rule with impunity and absolute disregard for the rule of law.

In addition to the above stated issues, most of the countries have very poor level of infrastructure. A perusal of Table 2.2 below shows that most people in the continent do not have access to internet facilities. In some countries like Ethiopia and Niger, internet usage is limited to 0.2% of the population. Endogenous growth models state that,

investment in research and development, in physical capital and in human capital are major determinants of economic growth (Gross, 2001). Where a large percentage of the population are not literate enough to be able to use internet facilities, it will surely affect the level of development. Likewise, most of the road network is bad. Some countries like Chad, Tanzania, Cameroon, Rwanda and Sierra Leone have less than 10% of their road network tarred. This confirms the poor state of infrastructure within the continent, just to mention a few.

Table 2.2 -Some Development Indices for African Countries in 2005

Country	Life expectancy at birth, total (years)	Internet users (per 100 people)	Roads, paved (% of total roads)
Algeria	72	5.8	69
Angola	46	1.1	10
Benin	60	1.3	-
Botswana	43	3.3	33
Burkina Faso	52	0.5	-
Burundi	49	0.5	7
Cameroon	50	1.4	8
Cape Verde	70	6.1	69
Cent. African Republic	44	0.3	-
Chad	51	0.4	1
Congo, Rep.	53	1.5	10
Côte d'Ivoire	57	1	10
Egypt, Arab Rep.	70	11.7	78
Ethiopia	54	0.2	13
Gabon	60	4.9	10
Gambia, The	55	3.8	35
Ghana	57	1.8	15
Guinea-Bissau	47	1.9	-
Kenya	53	3.1	12
Lesotho	43	2.6	18
Libya	74	3.9	57
Madagascar	59	0.6	12
Malawi	47	0.4	-
Mali	53	0.5	12
Mauritius	72	24.1	100
Morocco	71	15.3	62
Mozambique	43	0.9	19
Niger	56	0.2	21
Nigeria	47	3.5	-
Rwanda	48	0.6	8
Senegal	53	4.8	29
Seychelles	72	25.3	-
Sierra Leone	46	0.2	8
South Africa	51	7.7	20
Sudan	57	1.3	36
Swaziland	46	3.7	-
Tanzania	54	1	4
Togo	62	5	32
Tunisia	74	9.5	68
Uganda	51	1.7	-
Zambia	44	2.9	-

Source: - The World Bank Development Indicator (2007)

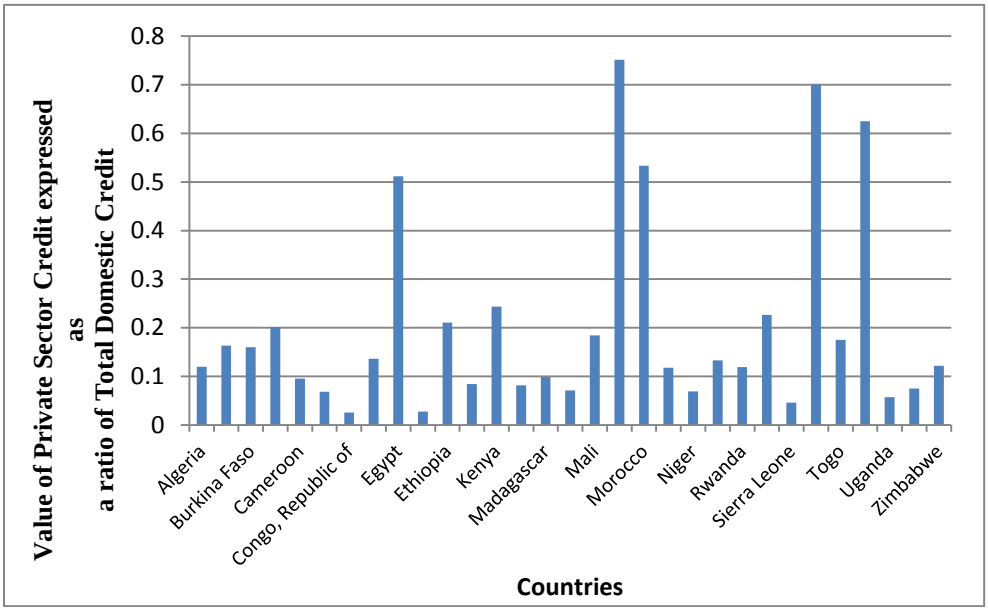
The above highlighted situation in Africa may have accounted for some of the reasons why the life expectancy within the region is exceptionally low. Some countries like Botswana, Lesotho and Mozambique have life expectancy as low as 43 years.

2.10 Banking in Africa

As earlier mentioned, the African continent consists of 54 countries, out of which about 49 are included in two different combinations for the analysis. The sample covers deposit money banks that constitute the larger percentage of the financial sector due to the under-developed nature of the capital market. This scenario makes firms to rely on the Deposit Money Banks for funds to improve their business activities, which increases the productive base of the economy. As stated earlier, literature is settled on the importance of credit to the private sector than an all bank intermediation, which are not channelled to the productive sectors of the economy. As a result, banks should be encouraged to channel funds to the growth promoting sectors of the economy.

However, for African countries, the percentage of credit to the real sector is so small to impact growth. Figure 2.9 below shows that credit to the private sector as a percentage of Total Domestic Bank Credit is either below or around 20%.

Figure 2.9: Private Sector Credit as a ratio of Total Domestic Credit for African Countries in 2005

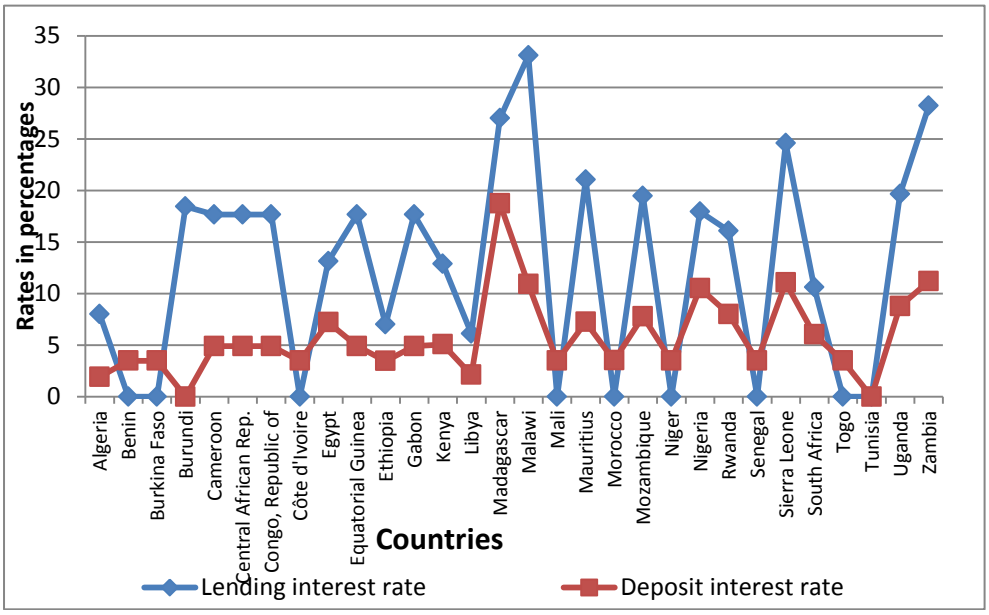


Source: - The World Bank Development Indicator (2007)

This subsequently implies that about 20% of domestic bank credit is channelled to the growth promoting sectors of the economy, while almost 80% (some countries are even more than that) is invested in areas that do not affect growth of the economy.

Apart from this, the cost of credit is another hindrance to credit expansion. As mentioned in the discussion on Nigeria, the cost of credit is very high in most of the countries; usually above single digit. Using the concept of asymmetric information and moral hazard, it has the possibility of pushing away credible investors who cannot afford such high costs. They end up (if opportune) to seek for funds outside the continent. This portends a negative signal, which we will discuss in the subsequent chapter. While the cost of credit is high, the price of deposit funds is relatively low I present this scenario in figure 2.11 below.

Figure 2.11: Lending and Deposit Interest Rates for African Countries in 2005



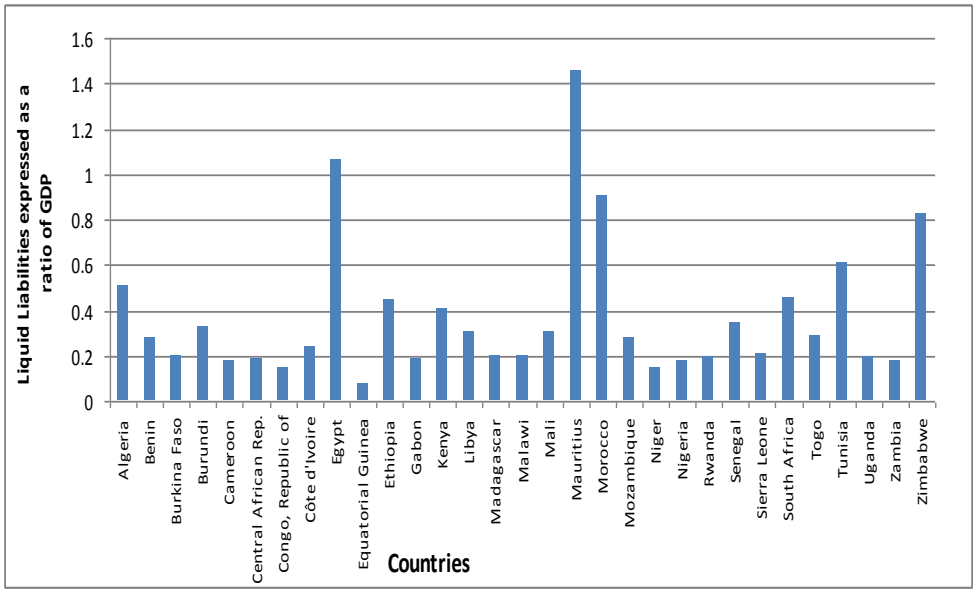
Source: - The World Bank Development Indicator (2007),

Note: - Countries that are on the zero line depicts no data availability

This chart shows wide gap between lending and deposit rates which may discourage credible investors and savings which provides opportunity for high profits for the bank at the expense of the banking public.

Rioja and Valev (2004) suggest that with a minimum threshold of 20% for liquid liabilities, economies will be able to harness growth better. Figure 2.12 below shows that several African countries still fall below this threshold. The above could explain some of the reasons why finance may not play the expected roles in national development.

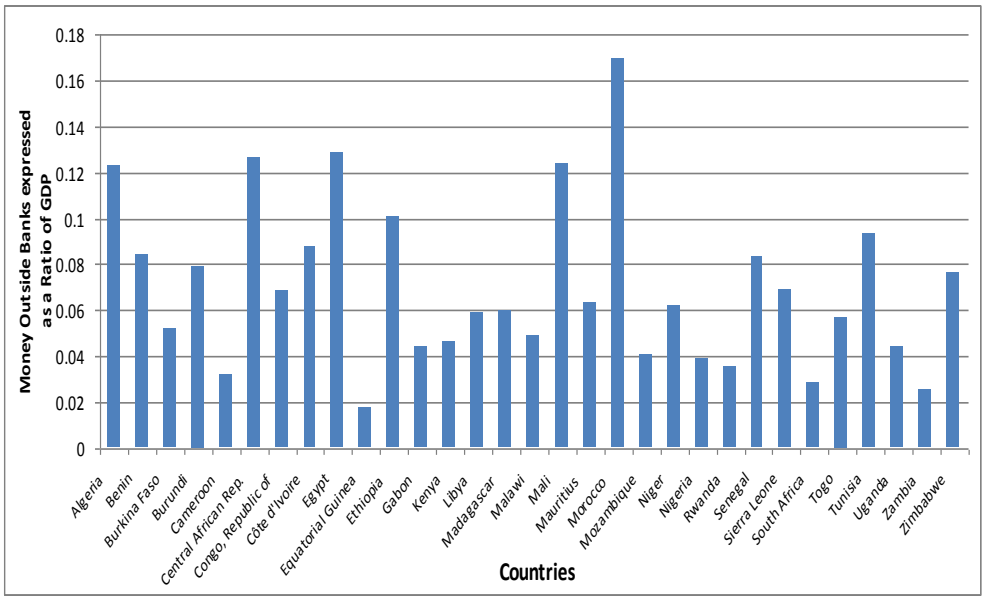
Figure 2.12: Liquid Liabilities as a ratio of GDP for African Countries in 2005



Source: - The World Bank Development Indicator (2007)

In addition to the above, an additional measure of financial depth is the ratio of money that is outside the banking system. I express this variable as a ratio of GDP and present it in figure 2.13 below. Except for few outliers, most countries are within the range of 0.4 to 0.8. This asserts that African countries still maintain a sizeable amount of money outside the banking system. One of the studies conducted in this work shows that money outside the banking coffers does not correlate positively with the growth proxies. Intuitively this means that such funds miss out in the concept of financial intermediation hence understandable when it does not correlate with the growth proxies.

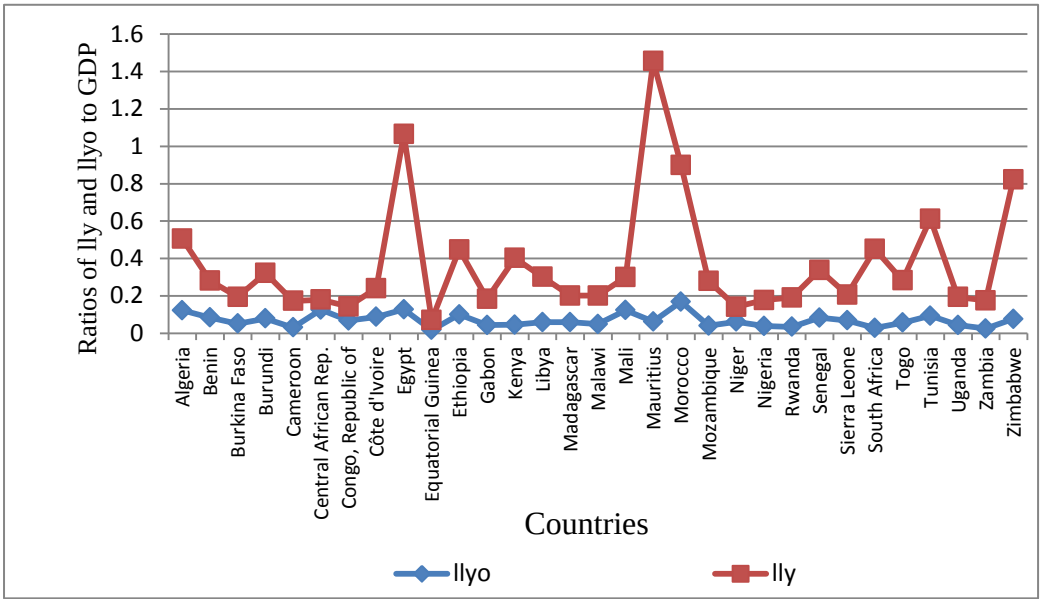
Figure 2.13: Money outside the Banking System as a ratio of GDP for African Countries in 2005



Source: - The World Bank Development Indicator (2007)

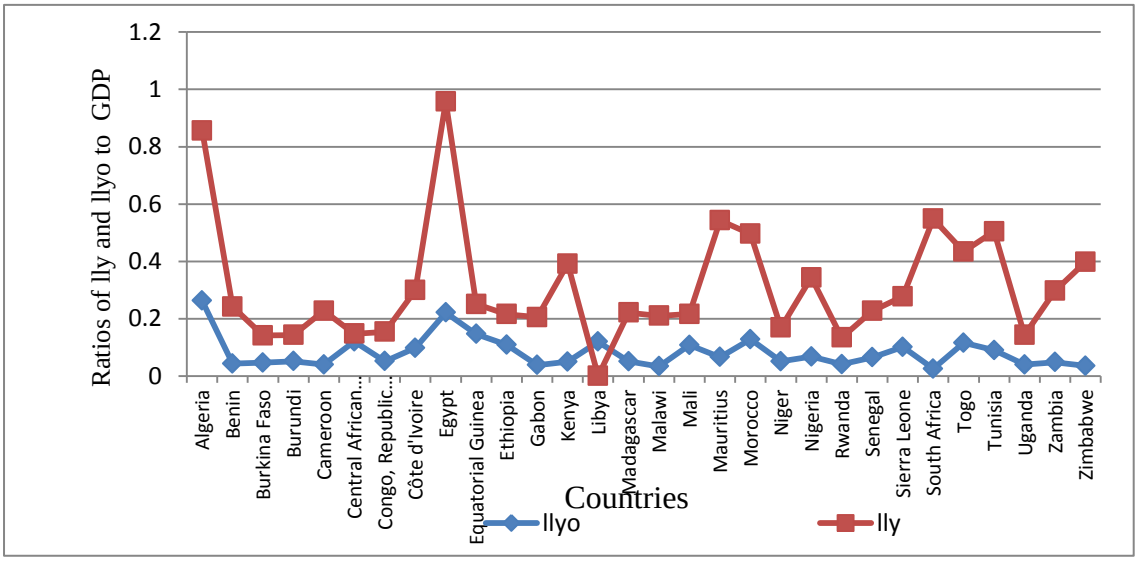
However, the volume of money outside the banking system seems to be reducing over time. Figures 2.14 and 2.15 below shows that liquid liabilities expressed as a percentage of GDP increases between 1985 and 2005, while money outside the banking system expressed as a percentage of GDP for the same period shows declining trend. This is a good sign, but still has to reduce further the amount of money that is outside the banking system and at the same time increase the liquid liabilities.

Figure 2.14: Liquid Liabilities (lly) and Money outside Deposit Money Banks (llyo); both expressed as a ratio of GDP for African Countries in 2005



Source: - The World Bank Development Indicator (2007)

Figure 2.15 -Liquid Liabilities (lly) and Money outside Deposit Money Banks (llyo); both expressed as a ratio of GDP for African Countries in 1985

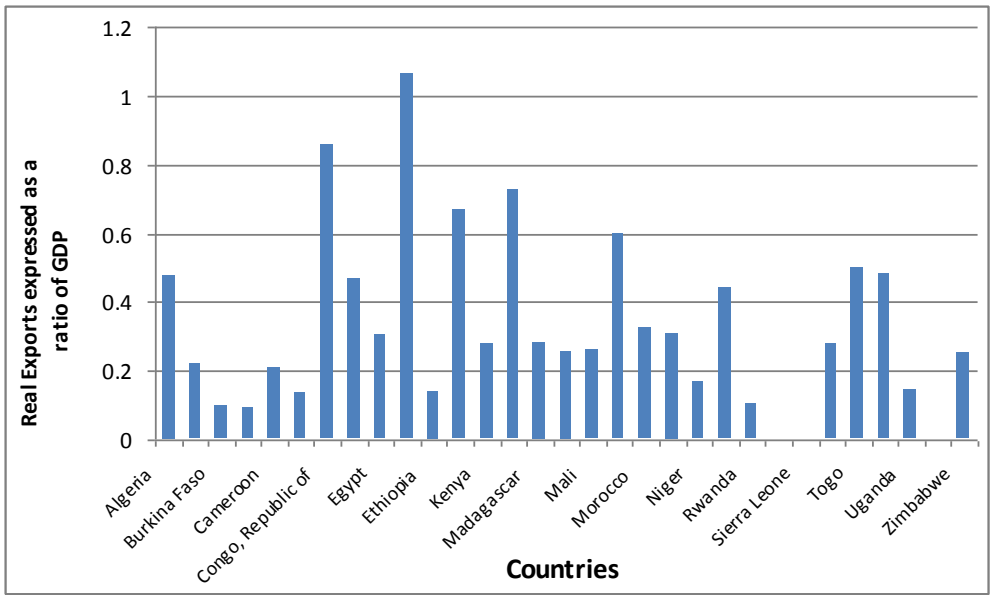


Source: - The World Bank Development Indicator (2007)

As previously stated, Africa is endowed with naturally resources, most of which are raw materials because added value are highly minimal. According to Frankel and Romer (1999), exports are very important in stimulating growth. This, according to them happens because trade is capable to raise income by spurring the accumulation of physical and human capital; thereby increasing output for given levels of capital. Figure

2.16 below shows exports of goods and services expressed as a ratio of GDP. A perusal of this chart shows that most of the countries had values within the range of 40% and below. The only exception is Equitorial Guinea which has above 100% value. This country is an oil exporting country. Therefore, the value of exports within the region is low for a meaningful development activity. If the products exported are transformed through addition of value, it will have positive impact on the value of export and may impact development at a better rate. Unlike the liquid liabilities and private sector credit, where we use the threshold estimation of Rioja and Valev (2004), this assertion is not based on such estimation thus limited to inference.

Figure 2.16: Real Exports as a ratio of GDP for African Countries in 2005



Source: - The World Bank Development Indicator (2007)

So far, I have examined the role of institutions in both Nigeria and Africa in general. Most of the premises considered in assessing this proffered similar result, which implies that the situation in most of the African countries is relatively similar. The position is not different when I consider the financial system (the deposit money banks), except for few countries that have outstanding result in some aspects of economic measurement, yet they show a poor figure when compared with other areas. This implies that no country totally passes the essential criteria for development. According to Honohan (2007), economic growth is the surest way to a substantial and sustained reduction in poverty in Africa; policy for long-term growth requires focusing on the larger and more

formal parts of the financial system. The continent should endeavour proper strategies for a sustained growth.

Financial Development and Economic Growth: Theoretical Framework

The seminal work by King and Levine (1993a) postulates existence of a relationship between financial development and growth. In this section, I provide some theoretical justifications for the underlying relationship. The research by Pagano (1993) adopts an endogenous growth model, which presents aggregate output (Y) as a linear function of aggregate capital stock (K). A is the coefficient denoting the impact of K on Y.

$$Y_t = AK_t \quad (1)$$

This equation is based on a competitive economy as discussed by Romer (1989) and assumes that technology has constant returns to scale while productivity is an increasing function of the aggregate capital stock (K). If we assume that B is a parameter by individual firms that responds to average capital stock according to $B = AK_t^{1-\alpha}$, then output of each firm will be

$$Y = BK_t^{\alpha} \quad (2)$$

Moreover, where there is N identical number of firms, output will be:

$$Y_t = Ny_t \quad (3)$$

It is assumed that population is stationary and that the economy produces a single good that can be invested. If depreciation is δ per period, Gross Investment is given by

$$I_t = K_{t+1} - [1 - \delta]K_t \quad (4)$$

In a closed economy with no government, capital market equilibrium requires that savings (S_t) be equal to gross investment (I_t):

$$S_t = I_t \quad S_t = I_t \quad (5)$$

It is also assumed that a proportion of the flow of savings will be lost in the process of financial intermediation, therefore

$$\varphi S_t = I_t \quad (6)$$

From equation (1) above, growth rate at time (t+1) is:

$$g_{t+1} = \frac{Yt+1}{Yt-1} = \frac{Kt+1}{Kt-1} \qquad (7)$$

If we drop the time indices, equation (5) becomes

$$g = A\frac{1}{Y} - \delta = A\varphi s - \delta \qquad (8),$$

where $s = \frac{S}{Y}$

Equation (8) is the key theoretical justification for my empirical approach since it shows that financial development can affect growth through an increase in φ, which is the proportion of savings funnelled to investment. This in the research represents credit to the private sector, which is one of the proxies for financial development used for estimation in chapters three and four. As depicted above I expect this proxy to be positive to growth. Financial development can also affect growth through an increase in A which is the social marginal productivity of capital. It may equally influence s, which is the private savings rate. This is a function of the intermediation concept which assumes that increase in savings rate increases funds which the deposit money banks allocates to for lending purposes. It therefore means that private savings increases, banks will be capable of giving out more funds to the private sector. This depends on the efficiency of utilisation, which I discuss later in the research.

Demetriades and Luintel (1997) use the AK growth model to analyse the relationship between finance and growth. They are of the opinion that where the economy's growth rate depend positively on the average product of capital and the proportion of resources devoted to capital accumulation, financial sector policies can influence both the process of financial intermediation and the equilibrium growth rate through several channels. Several versions of this model are used by other scholars too. (Romer, 1994; Greenwood & Smith, 1997).

The above case typifies a closed economy; however, we can adapt the model for open economy situation as discussed below.

The Case for an Open Economy

Trade and Growth

Easterly et al (1991) uses a model similar to Pagano (1993) in equation (1) above to accommodate openness. They consider two types of capital: K_1 and K_2 and model output as presented in equation (9) where F represents measures that enable the two types of capital to be combined to produce output.

$$Y = AF(K_1, K_2) \qquad (9)$$

The production function exhibits constant return to scale and diminishing marginal product on each output. Where there is no policy intervention, marginal productivity of the two types of capital will be equal, thus

$$F_1 = F_2 \qquad (10)$$

Let us assume that the two types of capital are used to produce two different types of goods that are traded internationally. Thus K_1 could be interpreted as capital invested on goods imported from abroad while K_2 is the capital used for domestic consumption, investment and exports. With this approach, the introduction of additional capital supports the existence of a relationship between output and trade, which underpins my empirical approach and is described by equation (11) below.

$$g = A\varphi i - \delta \qquad (11)$$

Based on this equation, the relationship between output and trade is expected to be positive (as detailed in table 2.3 above which provided the empirical justification for the use and sign of the variable), which is supported by Odedokun (1998), and King & Levine (1993a) and the result of my empirical analysis in chapters three and four of this research.

Foreign Inflow and Growth

Equation (11) above assumes that economic agents maximise the present value of their future welfare. It therefore implies that they will have to reward investors with adequate returns on their capital to willingly postpone consumption. In such a situation, growth will be captured as presented in equation (12), where $(A - \delta)$ denotes net rate of return on capital, ρ as the rate of discount and $1/\sigma$, the elasticity of intertemporal substitution (EIS). EIS pins down the response of capital to fluctuation in discount rate. The difference between net rate of return on capital and discount rate, multiplied by the elasticity of intertemporal substitution gives growth.

$$g = (A - \delta - \rho)/\sigma \qquad (12)$$

Using the similar model to that of trade above, Easterly (1992) proposes two types of investment where K_1 is the stock of cumulative foreign direct investment and K_2 is the capital stock owned and operated by nationals. The model assumes that nationals do not have access to international capital market while foreigners cannot operate in the local market. Owners of foreign capital have access to international market and will only invest in the domestic market when the local rate is not lower than international rate hence the marginal product for the foreign market. This implies that marginal product of foreign capital increases with lower ratio of foreign and domestic capital. In such a situation, equation (12) can be re-written as presented in equation (13) with F_2 as the marginal productivity of private capital

$$g = (AF_2 - \delta - \rho)/\sigma \quad \text{for } F_2 < 0 \quad (13)^4$$

The equation postulates a positive relationship between growth and foreign capital. My empirical study shows a positive relationship between foreign inflow and growth both in Nigeria and Africa as a whole. This result can be explained because the countries involved in this study are developing who are highly dependent on aid.

[4]The model is slightly modified with the exclusion of the tax component

Inflation and Growth

Inflation rate in the countries included in this study is observed to be widely dispersed over the period of study. While some countries had single digit inflation rate, many were above 30% and some had rates up to 65%. This can jeopardise possible chances of investment for these countries. In this model, inflation is treated as a tax on capital, which discourages investment. For this purpose, equation (11) can be re-written to accommodate inflation hence

$$g = A\varphi(\pi)i - \delta \quad \text{for } \varphi < 0 \qquad (14)$$

The understanding here is that inflation will make investors to reduce the volume of their investment hence a reduction to the growth process. It is expected to have a negative sign. This postulation is similar to the findings in my empirical estimation in chapter four. The high volatility associated with inflation in the countries of study may affect the development of the countries, as it will discourage potential investors.

Government Expenditure and Growth

Developing countries rely on public institutions because the private institutions are weak for the desired impact within the economy. This makes government expenditure important for growth. In explaining the role of government expenditure to growth, Easterly et al (1991) introduced the third type of capital to equation (9). This capital is called government capital (K_3) and presented in equation (15) below

$$Y = AF(K_1, K_2, K_3) \qquad (15)$$

The basic assumption here is that government capital is financed with a fixed share of the income from the formal sector and that it is used to finance productive investment. As such, both φ (efficiency of allocation of capital) and F_2 (marginal productivity of private capital) will have positive relationship with government expenditure.

Given that growth is promoted by efficient use of government capital, if government expenditure is utilised on areas that are not growth prone, the effect may not be positive.

I next discuss the theoretical basis for the demand-following and supply leading hypothesis, which I empirically investigate in subsequent chapters. I use a similar model to the AK growth theory.

Economic Growth and Financial Development: A Theoretical Framework

Demand-Following and Supply Leading Hypothesis

The concept of demand following hypothesis assumes that when the productive capacity of the economy increases, it propels the financial institutions to meet the financial requests of the firms. Formerly, Luintel and Khan (1999) model this with a demand function as presented in equation (16). The equation comprises of financial development (X); per capita output (Y) and real interest rate (R).

$$X = F(Y, R) \qquad \text{for } f_i > 0 \qquad (16)$$

It is assumed that X is the summation of x_1 and x_2; with $x_1 = f_1(Y)$ and $x_2 = f_2(R)$; for $f_1>0$ and $f_2>0$. Likewise, Banerjee et al (1998) makes a similar proposition by including per capita Investment to equation (16)

$$X = F(Y, I, R) \qquad \text{for } f_i > 0 \qquad (17)$$

The connection between finance and growth is stated explicitly by King & Levine (1993a) and further expatiated by Levine (2004). This equation forms the basis for the supply-leading hypothesis, which assumes that the activity of the financial institution causes an enlargement of the economy. In the study, output (Y) is affected by "financial factors" (X) and "all other factors" associated with growth (P) that finance does not capture. In essence, finance affects growth through funding of the firms by which the productive base of the economy increases.

$$X = B(X, P) \qquad \text{for } b_i > 0 \qquad (18)$$

The intuition used by King & Levine (1993a) is applied to both equations (16) and (17), thus present these in equation (19)[2] below. M is used to capture other factors associated with financial development (X) that are not captured by output(Y).

$$X = F(Y, M) \qquad \text{for } f_i > 0 \qquad (19)$$

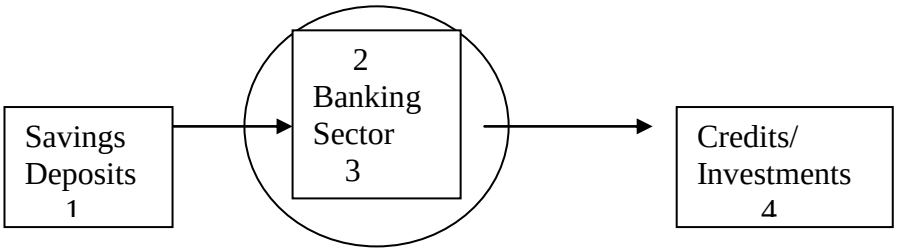
Based on this assertion, we now have two models that are similar to each other, with equation (18) explaining supply – leading hypothesis while equation (19) explains the demand – following hypothesis. The positive notation for b_i and f_i implies that the relationship between financial development and economic growth is expected to be positive and vice versa. My two empirical papers presented in chapters three and four supports this position. While financial development has positive relationship with economic growth, economic growth also has a positive relationship in most of the regression equations in the study.

All the variables, which, I discuss above under theoretical concepts for financial development and economic growth, are expected to have the same coefficient sign when financial proxy is the dependent variable. The only exception is our proxy for trade openness, which though presented in various forms in the analysis, but had negative coefficient.

2.11 Role of Banks in Intermediation

Finance literature provides support for countries with better/efficient financial systems to grow faster while inefficient financial systems bear the risk of bank failure (Kasekende, 2008). With the aid of an illustrative diagram presented in figure 2.17 below, he classified the functions of a sound financial system into four categories.

Figure 2.17: Functions of Financial System



Source: - Kasekende Louis (2008) Developing a Sound Banking System

According to the study, number 1 represents banks function of deposit mobilisation; 2 represents banks function in transforming savings into an adequate credit supply; 3 stands for financial institution dealings in financial transaction through payment system and 4 relates to allocating of these credits into economically and financially viable projects.

A major function of banks is to supply credit. This is an obligation by a financial institution to a customer for a specified amount of money at a fee called interest repayable over a period called duration subject to agreed terms and conditions. Before banks can give credit, they must source for fund called deposit, which constitutes the major component of their liability. Currently, the Basle Accord stipulates that banks should maintain 8% of their risk weighted total asset as capital.

Banks accept deposit from individuals and institutions thus mopping up savings from the surplus sector to the deficit sector of the economy (Mishkin 2007). Though they are subject to certain regulations by the authorities, financial intermediaries still determine the rules for allocating funds, as such play significant role in determining the type of investment activities, the level of job creation and the distribution of income (Gross 2001). This is of particular importance because without access to external finance by firms and industries, the constraint of self-finance sharply biases investment strategy towards marginal variations within the traditional technology (Mckinnon, 1973). A further view was proposed by Bencivenga and Smith (1991) when they opined that financial intermediation assist to channel savings into long term assets that are more productive than short term assets. Thus by eliminating liquidity risk, banks engage in qualitative asset transformation as they increase investment in high return illiquid asset and accelerate growth with the short-term deposit received from their clients.

Bagehot (1873) stated that a major difference between England and poorer countries was that in England, the financial system could mobilise resources for serious development. As such good projects would not fail for lack of capital. Thus, it was not limited to ability to pool savings alone but also allocating them to the most productive uses. Similarly, Demirguc-Kunt and Maksimovic (1996) opined that the higher is the

level of development of the financial institutions, the more relevant they are in growth. According to Demirguc-Kunt and Maksimovic, financial systems facilitates portfolio diversification for savers and investors; thus the more developed the financial system, the more choices is available to investors. This enhances a more efficient allocation of resources in the productive activities.

Likewise, Oura (2008) in his recent study postulated that having an efficient equity market does not seem to compensate for the lack of efficient debt financing opportunities in enhancing firm growth. The research which dwelt on corporate finance patterns and their relationship with external finance (finance sources that are external to the firm, but domestic to the economy) dependence and growth also observed signs of inefficiency in India's financial systems, particularly in the debt financing mechanism. He thus attributed the economy's recent growth to other factors such as strong productivity growth, which might have covered up any potential impact from financing side. Therefore, productivity growth could be highly cyclical as it has been in many other successful Asian economies.

Transaction cost reduces with the emergence of financial institutions. It is widely known that they assist in collecting and processing information about investment opportunities more efficiently and at lesser cost (King and Levine 1993a). Thus, they enjoy economies of scale with the existence of banks. This action reduces the cost of investment. In essence, a low financial development distorts growth and increases the cost of financial transaction.

Asymmetric information between borrowers and lenders which causes adverse selection and moral hazard often prevent market adjustment to operate between demand and supply through the price mechanism. Adverse selection is an ex-ante credit risk which entails the possibility of not knowing the customer sufficiently thus making a bad credit decision. Moral hazard is an ex-post credit risk, which entails the possibility of the borrower acting contrary to the agreed terms and conditions. However, banks are able to minimise these risks through screening and monitoring of potential customers. According to Gross (2001), financial intermediaries merely determine the allocation of

capital by diminishing (but not eliminating) the level of risk through information gathering and special contract design. This implies that banks utilise the imperfect nature of the market to determine who to allocate funds to.

The efforts of various governments trying to direct bank credit in favour of some sectors lends credence to the proponents of bank finance causing or stimulating economic growth. More recently, Habibullah and Eng (2006) use the GMM technique developed by Arellano and Bover (1995) and Blundell and Bond (1998) and conducted causality-test analysis on 13 Asian developing countries. The result is in agreement with other causality studies by Calderon and Liu (2003), Fase and Abma (2003), Christopoulos, and Tsionas (2004). They find that financial development promotes growth, thus supporting the old Schumpeterian hypothesis.

King and Levine (1993a) employs cross country study to examine the link between financial development and economic growth using eighty countries made up of developed and developing economies. The aim of the research was to find out whether higher levels of financial development correlate significantly with faster current and future rates of economic growth, physical capital accumulation and economic efficiency improvements. The result shows that finance does not only follow growth; finance seems important to lead economic growth. Several research works on finance and growth support a positive correlation between the two variables while causality emanates from finance to growth. It may thus be apt to suggest from previous research work that financial services with particular emphasis on bank credit stimulate economic growth.

2.12 Banks as agent for growth

The proponents of endogenous growth model which states that investment in research and development, in physical capital and in human capital are major determinants of economic growth have always identified the role of banks in generating growth within the economy. This view is not a new phenomenon as said earlier due to seminal work by economists like Schumpeter (1934) on the importance of banks in facilitating

technological innovation through their financing role. Other researchers thereafter made similar postulations, though used different methodologies to explain the whole process. One of such person is Goldsmith (1969) in his study of 35 countries between 1860 and 1963.

Allen and Ndikumana's (1998) findings suggest that financial activities assist to reduce liquidity risk and allow the management of risk for savers and investors. They also assist to channel savings into long-term assets that are more productive than short-term assets (Bencivenga and Smith, 1991). Thus by eliminating liquidity risk, banks can increase investment in high return illiquid asset and ultimately accelerate growth. Similarly, Demirguc-Kunt and Maksimovic (1996) discussed the concept of portfolio diversification for savers and investors. The more developed the financial system, the more choices it offers to investors, thus enhancing a more efficient allocation of resources in the productive activities.

Following the line of argument of the previous researchers, Gregorio and Guidotti (1995) investigate the relationship between long run growth and financial development proxied by ratio of bank credit to the private sector to GDP. They find that the proxy correlates positively with growth though with changing impact across countries. A negative correlation emerges in a panel data for Latin America. This result they attribute to financial liberalization in a poor regulatory environment. Gregorio and Guidotti conclude that the main channel of transmission from financial development to growth is the efficiency rather than the volume of investment. Hao (2006) examines how the development of financial intermediation influences China's economic growth. He posits that financial intermediation development contributes to growth through two channels; first, the substitution of loans for state budget appropriation and the mobilization of household savings. Consequently, loan expansion does not contribute to growth if the distribution is inefficient. Honohan (2007) further explores this view. He states that financial access correlates negatively with income inequality. This implies that access to finance promotes per capita income thereby enhancing growth, emphasising the importance financial development and its favourable impact on economic growth.

Odedokun (1998) gives a slightly varied view on the issue. He suggests that the combined effects of financial intermediation which are the externality and inter-sectoral factor productivity differential effects on growth are positive and do not appear to depend on the stage of economic development attained. This view supports a strong role for financial institutions to impact growth and does not believe that the level of development of the country does not really matter in this instance. Despite all these views, some scholars do not adduce the growth of the economy to financial development. They are of the opinion that the financial institutions are not as important as it is currently ascribed to them.

In the view of Robinson (1952), the economic activity actually propels the financial development to expand their credit base thereby increasing the productive base of the economy. He concludes with the statement "where enterprises lead, finance follows". Others have also expressed similar views like Lucas (1988) and Favara (2003). They believe that researchers elaborate the role of finance because evidences from their work posit a weak relationship between financial development and economic growth. Even Favara (2003) is of the opinion that the relationship between them is not linear, thus if dynamic specification and slope heterogeneity across countries are considered, the effect becomes an inverse relationship.

A recent argument in the literature is natural resource curse, which I discuss in the next section.

5

Theoretical Analysis of Non-Linearity and Threshold

Albu (2007) discusses a simple concept of nonlinearity in economic relationship with a simple equation consisting of the advertising expenditure in a company (W_t), where $0 \leq W_t \leq 1$. Thus, I present this discrete dynamic system in equation (20) below

$$W_{t+1} = f(W_t) = \mu W_t(1 - W_t) \qquad (20)$$

It is assumed that the company's level of income (V_t), initially increases with increase in advertising expenditure (Wt) up to a stage after which it starts to decline. It is also assumed that expenditure in time (t+1) is proportional with income obtained in time (t) and represents the relationship as

$$V_t = \lambda W_t(1 - W_t), \lambda > 0 \qquad (21)$$

$$W_{t+1} = \gamma V_t, \quad \gamma > 0 \qquad (22)$$

A combination of equations (21) and (22) results in equation (20) where $\mu = \lambda\gamma$, and when simulated results in a non-linear relationship. Rioja & Valev (2003) made a similar postulation when they hypothesise that the relationship between financial development and economic growth may not be equal, thus varying according to the level of development of each country. Specifically, the study observed a number of developing countries where a robust positive positive effect of finance on growth cannot be established and postulated that postulated a threshold of about 0.14 for Private Credit and 0.21 for Liquid liabilities. The government of each country is viewed to be capable to foster or refrain financial sector development in determining growth.

This argument is similar to the natural resource curse hypothesis, which postulates that countries that are highly dependent on natural resources such as oil, gold, diamond etc experience lesser growth. As a result, they may have negative relationship between natural resource dependence measured as ratio of primary exports to GDP and development parameters (Wantchekon, 1999; Ross, 2003 a and b; Sala-i-Martin & Subramania, 2003). This is due to the spate of political unrest; corruption and waste that afflicts these countries. In particular, emphasis is laid on corruption which could be in the form of inflated contracts or outright refusal to perform contracts for which funds was disbursed. In such a situation, the effect could be negative as the funds meant for public usage is now in the hands of few who are in privileged position of power. Some past rulers in these countries are richer that the country they ruled because of massive amasses of public money for their personal use. The outcome of these vices is that development variables will fall short of what obtains in the stable economies, as such below the level where it can significantly affect the economy positively.

Specifically, in the first empirical study on Nigeria, export of non-oil is positive to financial development, while oil export is negative to it. Nigeria is a mono-product

economy (dependent on oil exports), hence total exports is also negative to financial development. A possible explanation will be high rate of corruption, which makes a large amount of the resources meant for the whole economy diverted to personal accounts. I got a similar result for the panel estimation on African countries. It is not possible to examine the effect of primary products for African countries as we did in the Nigerian study due to non-availability of data for that purpose. Nonetheless, these countries are all primary producers of export products and highly dependent on the revenue for development albeit being plagued with numerous political and economic vices earlier discussed. Some other developmental variables included in the study such as government expenditure equally show unstable result at some point. Before proceeding to the empirical section, Table 2.3 below presents a summary of the expected signs based on the theoretical models reviewed above**.**

Table 2.3: Expected Coefficient Sign based on theoretical discussion

Variables	**Dependent Variable**	**Model**	**Theoretical Expectation**	**Regression**
Growth	Financial Development	Luintel & Khan (1999)	Positive	Tables 3.7, 4.5, 4.8
Financial Development	Growth	Pagano (1993)	Positive	Tables 4.4, 4.7
Trade	Growth	Easterly et al (1991)	Positive	Tables 4.4, 4.7
Government Expenditure	Growth	Easterly et al (1991)	Positive*	Tables 4.4, 4.7
Inflation	Growth	Easterly et al (1991)	Negative	Tables 4.4, 4.7
Foreign Inflow	Growth	Easterly et al (1991)	Positive	
Trade	Financial Development	Equation (19)	Positive*	Tables 3.7, 4.5, 4.8
Government Expenditure	Financial Development	Equation (19)	Positive*	Tables 4.5, 4.8
Inflation	Financial Development	Equation (19)	Negative	Tables 4.5, 4.8
Foreign Inflow	Financial Development	Equation (19)	Positive	Tables 3.7, 4.8

* denotes some expected variations between financial development proxy and trade; growth / financial development proxy and government expenditure based on the explanations above

CHAPTER THREE

BANK CREDIT AND ECONOMIC GROWTH: THE NIGERIAN EXPERIENCE

3.0 Introduction

The existence of a relationship between finance and growth seems incontestable as many researchers have worked on the issue and positively confirmed it. What is debatable is the direction of causality between finance and growth. Patrick (1966) describes the direction of causality as supply-leading and demand-following hypothesis. Mckinnon (1991) buttressed this postulation. When causal relationship runs from financial development to growth, it is termed supply leading because the activities of the financial institution increase the supply of financial services, which creates economic growth. Similarly, when the growth within the economy results in increase in the demand for financial services and this subsequently motivates financial development, then it is termed demand-following hypothesis. Other scholars believe that causality runs in both directions.

3.1 Types of Causation

Supply – Leading Hypothesis

The proponents of this hypothesis believe that the activities of the financial institutions serve as a useful tool for increasing the productive capacity of the economy. They opine that countries with better-developed financial system tend to grow faster. As previously stated, early economists like Schumpeter (1934) have strongly supported the view of finance led causal relationship between finance and economic growth. Subsequently, several researchers have supported the findings. According to Mckinnon (1973), a farmer could provide his own savings to increase slightly the commercial fertiliser that he is now using and use it to calculate the return on the marginal new investment. However, there is a virtual impossibility of a poor farmers' financing from his current savings, the total amount needed for investment in order to adopt the new technology. As such, access to finance is likely to be necessary over the one or two years when the change takes place. The need by firms which the banks support ultimately increases output.

Going through the literature in more detail, the seminal study conducted by King and Levine (1993a) on seventy-seven countries made up of developed and developing economies used cross-country growth regression. The aim of the research was to find out whether higher levels of financial development correlates significantly with faster current and future rates of economic growth, physical capital accumulation and economic efficiency improvements. The result showed that finance not only follows growth; finance seems important to lead growth. This further buttressed the assertion that financial services stimulate growth. Greenwood and Jovanovic (1990) also find that financial institutions produce better information, improve resource allocation (through financing firms with the best technology) and thereby induce growth. Several research works on finance and growth support a positive correlation between the two variables while causality emanates from finance to growth.

Following the line of argument of the previous researchers was Gross (2001) who used two growth models to examine the impact of financial intermediation on economic growth. He stated that growth does not happen for exogenous reasons; instead, governments through appropriate policies particularly with regard to financial market can influence it. The recent work of Demirguc-Kunt and Levine (2008) in a review of the various analytical methods used in finance literature, find strong evidence that financial development is important for growth. This is because it is crucial to motivate policymakers to prioritise financial sector policies and devote attention to policy determinants of financial development as a mechanism for promoting growth.

Diego (2003) uses panel estimation technique to assess the mechanisms through which policy changes have influenced the growth performance of fifteen European Union economies also supports the above postulations. He concludes with the aid of two channels. First is the increase in the level of financial intermediation measured by the rise in the private credit to GDP. The second channel was the improvement in the quality and efficiency of the financial intermediation process proxied by the fall in the growth rate of the ratio of non-performing loans to total loans. The result reveals that the harmonisation process affects growth through the increase in the level and efficiency

of financial intermediation. The liberalisation of capital controls primarily affects growth through improvements in the degree of efficiency in financial intermediation, he concluded.

In furtherance to the above studies, a good number of other recent studies lend further credence to a causal relationship between credit and economic growth. The IMF autumn 2008 Global Financial Stability Report detected a statistically significant impact of credit growth on GDP growth. Specifically, it was revealed that "a credit squeeze and a credit spread evenly over three quarters in USA will reduce GDP growth by about 0.8% and 1.4% points year-on-year respectively assuming no other supply shocks to the system".

The research work by Swiston (2008) on the USA used a VAR containing two lags to construct a model. He used variables such as nominal interest rate, yield on investment grade corporate bonds with remaining maturity of 5-10 years to capture long term interest rate, real GDP, oil prices, equity returns and real effective exchange rate made positive contribution in that direction. He posits that credit availability proxied by survey results on lending standards is an important driver of the business cycle, accounting for over 20% of the typical contribution of financial factors to growth. A net tightening in lending standards of 20% basis points reduces economic activity by ¾% after one year and 1¼% after two years

Demand – Following Hypothesis

The proponents of this view opine that growth does not relate to banks. They postulate that growth is a causal factor for financial development. According to them, as the real sector grows, the increasing demand for financial services stimulates the financial sector (Gurley and Shaw 1967). Robinson (1952) was of the opinion that economic activity propels banks to finance enterprises. Thus, where enterprises lead, finance follows.

Following the same line of argument was Goldsmith (1969) who used an alternative view of emphasising the role of capital accumulation in economic growth. According to him, overall financial development matter for economic success as it lowers market friction, which increases the domestic savings rate and attracts foreign capital. Financial policies such as direction of credit to sectors itself do not seem to matter much as policy makers may achieve greater returns by focusing less on the extent to which their country is bank based or market based and more on legal, regulatory and policy reforms that boost the functioning of the markets and banks. Using data from 35 countries between 1860 and 1963, he empirically concluded, "A rough parallelism exists between economic and financial development in the long run".

Similarly, Lucas (1988) believed that economists have badly overstressed the role of financial factors in growth. In essence, banks only respond passively to industrialisation and growth. Empirically, a re-examination by Favara (2003) of the analysis of Levine et al (2000) used the panel estimation technique and reported that relationship between financial development and growth is at best weak. He is of the opinion that there is no indication that finance spurs growth, rather for some specifications, the relationship is puzzlingly negative. Therefore, the effect of financial development on growth is ambiguous and not robust to alternative dynamic specifications. This he attributed to the fact that financial development does not have a first order effect on growth; the link between them is not linear and if the dynamic specification and slope heterogeneity across countries are considered, the effect is negative.

The findings by Muhsin and Eric (2000) on Turkey further lend credence to this postulation. According to their study, when they use bank deposit, private sector credit or domestic credit ratios as proxy for financial development; causality runs from economic growth to financial development. They conclude that growth seems to lead financial sector development.

Bi-directional Causality

The proponents of this view postulate that there is a bi-directional relationship between finance and growth. Demetriades and Hussein (1996) investigate 16 less developed countries between 1960 and 1990 with the aid of time series technique. They uncover a long run relationship for indicators of financial development and per capita GDP in 13 countries. However, they find bi-directional causality in six countries and reverse causality in six countries while South Africa showed no evidence of causation between the variables. Likewise, Odedokun (1998), use the ordinary least square method and reports varying degree of effects of finance on growth for both high and low income groups in the developing countries.

Demetriades and Andrianova (2004) postulate that whether financial development Granger causes growth, it is important that the financial system is well functioning. If so, they believe it will assist the real economy to exploit available new opportunities. When there is reverse causation, it assumes that when the real economy grows, there will be more savings coming into the financial system, which will allow it to extend new loans.

We can apply this assertion to the Shan and Jianhong (2006) study of China where they find a two-way causality between finance and growth. With the aid of VAR techniques and using five variables namely GDP, total credit to the economy, labour, investment and trade, they find that financial development was the second most important factor after the contribution from labour force growth in affecting economic growth. They also find that strong economic growth in the last 20 years has significant impact on financial development by providing a solid credit base, concluding that Granger causality from GDP growth to financial development is stronger than the causality from finance to GDP growth.

Lastly, although evidence from their empirical work support the fact that both finance and real output relates positively to each other, the relationship is country specific and one should not extrapolate one country's experience to another. Based on this assertion,

this research will examine the causal relationship that exists between finance and growth in Nigeria.

3.2 Indicators of Credit and Economic Growth

In this study, I focus on the role of private sector credit to drive economic growth. Previous work uses various measures of financial development. For example, Allen and Ndikumama (1998) use credit to the private sector, volume of credit provided by banks and liquid liabilities of the financial system (measured by M3). King and Levine (1993) use the ratio of liquid liabilities of the financial system to GDP; ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets and ratio of claims on the nonfinancial private sector to total domestic credit. Oura (2008) use the ratio of external (bank) finance to total firm finance while Davis (2004) use four variables as indicators of financial development namely – stock market capitalisation, stock market turnover, listed companies and bank credit. Some other studies use stock market indicators, which indicate financial development for more advanced countries.

In general, total domestic bank credit can be sub divided into two: credit to the private sector and credit to the public sector. As earlier stated, empirically studies show that credit to the public sector is weak in generating growth within the economy because they are prone to waste and politically motivated programmes, which may not deliver the best result to the populace. (see for example Beck et al 2005; Levine 2002; Odedokun 1998; King and Levine 1993). Boyreau-Debray (2003) finds a negative correlation between growth and banking debt due to the fact that Chinese banks were mobilizing and pouring funds into the declining parts of the Chinese State Enterprise, and hence the system has not been growth promoting. Demirguc-Kunt and Levine (2008) emphasised the importance of focusing on allocation of credit to the private sector as opposed to all bank intermediation. Similarly, Beck et al (2005) and Crowley (2008) also confirm private credit as a good predictor of economic growth.

As previously discussed, there is little information available about how the activities of the financial industry affect their respective economies. In essence, the factors that drive credit growth are largely not researched hence the contribution of the well acclaimed private sector credit to the growth of the economy may not be easily measured. Thus, I fill this gap by analysing the contribution of private sector credit to the growth of the economy and determine the factors that are significant for credit growth.

Credit is not the only factor promoting growth within the economy. Frankel and Romer (1999) establish the importance of trade in generating growth within the economy. In their view, trade proxied by total exports has a quantitatively large and robust positive effect on income. They find that a rise of one percentage point in the ratio of trade to GDP increases income per person by at least one-half percent. This they believe happens because trade appears to raise income by spurring the accumulation of physical and human capital; thereby increasing output for given levels of capital. Nigeria is a country that has foreign trade accounting for a sizeable proportion of GDP. A perusal of the ratio of real exports to real GDP reveals that real exports which accounted for about 10% of GDP in 1970, increased to over 50% by 2004 with the highest percentage increase in 2000 at 59%. Based on the postulation of Frankel and Romer (1999) above, it is important to investigate the effect of such an increase, which is in excess of 300% between 1970 and 2006, to the growth of the economy.

The Nigerian economy in the past three decades has witness a drift from a multi-product agrarian economy to a mono-product oil dependent economy. As highlighted in chapter two, the percentage contribution of oil and non-oil to total export were 57.6% and 42.4% in 1970. This has increased and reduced to 98.3% and 1.7% respectively for oil and non-oil export by 2005. Therefore, the increase witnessed with total export is attributable to oil export. Crowley (2008) posits that oil export impacts credit growth directly by providing wealth and liquidity in the exporting countries.

The significance of foreign inflows in enhancing credit growth has also been widely discussed in literature, but there is no consensus opinion about the effect so far. Crowley (2007b) finds that foreign inflows are significant for growth of credit in Slovak

Republic. Several other previous studies support this assertion (Arvai 2005 and Duenwald et al 2005). However, Cottarelli et al (2003) posited that domestic savings flows is the main factor responsible for the growth of credit in Eastern Europe, and as such there was no evidence that foreign inflows is significant in stimulating credit growth.

In conclusion, many studies discussed in this paper support the role of banks as agents for growth within the economy. Though there are some contrary evidences, they are few when compared to those in support of the proposition. Secondly, many studies support the existence of a long run relationship between finance and growth. What is unsettled is the issue of causality between the two variables. However, the efficiency of the system rather than the volume of financial activities are vital to facilitate development. It is important that they allocate funds to their most productive uses.

3.3 Data, Analytical Method and Model Formulation

Empirical studies have agreed that there exists a linear relationship between credit and economic growth. In order to examine this, previous studies have used several analytical approaches. These include cross-country growth regression used by King and Levine (1993a); panel techniques used by Rioja and Valev (2003) and time-series used by Demetriades and Hussein (1996). These approaches Demetriades and Andrianova (2003) summarised that 'It is difficult to draw out any reliable policy implications from cross-country or panel regressions, and those conclusions that we may draw from time-series studies for individual countries cannot be generalised'. In essence, time-series is more applicable for single country analysis; hence I use time-series method of estimation following the approach proposed by Ghirmay (2004), Tang (2003), Demetriades and Hussein (1996). According to Demetriades and Andrianova (2003), this allows the use of appropriate statistical procedures, such as cointegration to test for the long run relationships; they also allow the use of statistical procedures that can shed light on the causality between two or more variables in both the long run and the short run. However, not without its limitation, it is suitable as an appropriate tool in single country analysis.

Demetriades and Hussein (1996) conclude that both Engle/Granger and Johansen based ECM are useful in determining the direction of causality between variables in a series. They however accord more importance to the result of the second technique because the Wald tests based on the levels VAR approach are, at best, only valid asymptotically (Toda and Phillips, 1993). Davis and Madsen (2008) further explain it when they show that Granger causality does not give proof on causality. According to them, it is only useful in assessing whether there is a consistent pattern of shifts in one variable preceding the other. It is mainly useful in establishing grounds for further investigation. Therefore, we use the Engle Granger and Johansen based ECM in establishing the direction of causality.

The determinants of credit growth are discussed in literature as earlier stated. What is very clear is that, there is no universal model for dealing with this issue. According to Rioja and Valev (2003), what appears not to have, statistical significance in one area may have a positive significant effect in other areas, even with varying degrees of significance. Rioja and Valev use the multivariate model developed by Crowley (2008) to determine this relationship. The model adopts a cross-country regression approach to determine the factors that are crucial in driving credit growth within the Middle East, Mediterranean North Africa and Southwest Former Soviet Union countries of Central Asia.

The empirical analysis in this paper consists of two parts. The first part analyses the significance of bank credit for growth, while the second part identifies the factors that are important for the financial development of the country.

3.4 Model Specification - Is Bank Credit Important for Growth in the Nigerian Economy?

In analysing the effect of bank credit on growth, I start with the bivariate model developed by Ghirmay (2004) in the study of thirteen African countries on financial development and growth. The models that I used in estimating this relationship are: -

$$LY_t = \beta_0 + \beta_1 LC_{t-1} + \varepsilon_t \qquad \textit{model 1a}$$

$$LC_t = \beta_2 + \beta_3 LY_{t-1} + \varepsilon_t \qquad \textit{model 1b}$$

Where: - LY = Log of Real Gross Domestic Product growth

LC = Log of Real Private Sector Credit growth

β_0 and ε_t are the constant and the error terms respectively

To avoid the bias of using bivariate framework in estimation as stated by Lucas (1988) and Al-Yousif (1999) due to possible omission of variables, I add exports to model 1a and 1b above (Frankel and Romer 1999 and Darrat et al 1989), as in the multivariate model by Tang (2003) in the context of bank lending and growth in Malaysia. The models that I estimate are -

$$LY_t = \beta_5 + \beta_6 LC_{t-1} + \beta_7 LX_{t-1} + \varepsilon_t \qquad \textit{model 2a}$$

$$LC_t = \beta_8 + \beta_9 LC_{t-1} + \beta_{10} LX_{t-1} + \varepsilon_t \qquad \textit{model 2b}$$

where: - LX = Log of Real Total Export growth

In estimating these models, I anticipate the possible problem of causality (earlier discussed). This is expected to be analysed with the use of the econometric approach used by Demetriades and Hussein (1996) for estimating whether financial development causes growth using time- series on sixteen countries and named it model 3 below.

Two measures of financial development are used. They are the ratio of bank deposit liability to nominal GDP (D), which captures the broad money stock excluding currency in circulation. According to them, currency held outside the banking system represents

a large component of the broad money stock in the developing countries. The second measure of financial development is the ratio of bank claims on the private sector to nominal GDP (F), which I use to capture the extent of financial intermediation. I argue that it is possible that increase in bank deposit liability does not result in increase in credit to the private sector because the government apportions the increase in financial saving through higher reserve requirement. These two ratios depict the extent of financial development at a specific time. The indicator for growth is real GDP per capita (G) measured in domestic currency. All the variables are in natural logarithms. I measure the variables of financial development individually against that for economic growth with a view to establish the extent of financial deepening within the area.

As previously stated, we use the Johansen ECM method to determine the direction of causality. The procedure involves conducting:-

- Unit root tests to establish the order of integration of each variable

- establishing the long run relationship between the variables through a cointegration test and

- Use the ECM test for determining the direction of causality.

The ECM model tested is: - $\Delta LG_t = \mu + \Gamma(L)\,\Delta LG_{t-1} + P_0 LG_{t-1} + \varepsilon_t$

Where LG represents Log of GDP per Capita; μ represents the constant; Γ(L) are polynomials of the order of k-2; Po are polynomials of the order of k-1 and ε_t is the error term. The same model applies to other variables namely LF which represents log of bank credit and LD representing log of bank deposits.

For the bivariate models of LG & LF and LG & LD respectively, the above models is re-written as -

$$\Delta LG_t = \mu + \beta_{11}\Delta LG_{t-1} + \beta_{12}\Delta LF_{t-1} + \Omega_{11}\Delta LG_{t-1} + \Omega_{12}\Delta LF_{t-1} + \varepsilon_t \quad \text{model 3a}$$

$$\Delta LG_t = \mu + \beta_{21}\Delta LG_{t-1} + \beta_{22}\Delta LD_{t-1} + \Omega_{21}\Delta LG_{t-1} + \Omega_{22}\Delta LD_{t-1} + \varepsilon_t \quad \text{model 3b}$$

In essence, models 1-3 provides solution to the first research question on the significance of bank credit in generating growth within the economy. It is expected that these variables will have positive relationship with each other as stated in my previous discussion in chapter two and also listed in table 2.3 above.

Many empirical studies have postulated that private sector credit is a better stimulant for growth rather than other forms of credit (Levine 2002; Odedokun 1998). As earlier stated, a country that develops the private sector is more likely to witness growth than that where the large chunk of the credit goes to the public sector. Against this background, we make use of credit to the private sector as a measure of bank credit.

3.5 ESTIMATION AND INTERPRETATION OF RESULTS - IS BANK CREDIT IMPORTANT FOR GROWTH IN THE NIGERIAN ECONOMY

The ADF test conducted for the variables shows that the series in accordance with Ghirmay and Tang models are integrated to the order of one hence I(1) except GDP that is integrated to the order of 2. However, observation made in respect of the regression results, which I discuss in the latter part of this work, makes it necessary to conduct causality test. Likewise, these papers discussed above are not detail in the analysis of causation hence the method and variables discussed by Demetriades and Hussein (1996) is used for this purpose. This requires conducting the ADF and cointegration tests before the eventual causation tests.

To conduct the cointegration test, I use the model by Demetriades and Hussein (1996) which we discuss earlier. This model uses two proxies for financial development. They are ratio of ratio of bank deposit liabilities to nominal GDP (D) and the ratio of bank claims on the private sector to nominal GDP (F). Real GDP per capita (G) represents the level of economic development. The variables (G, D and F) which are lagged and presented in their log form are integrated to the same order I(1) as revealed in the unit root test result (Table 3.1) below.

Table 3.1: - Unit Root Tests for Δ^2DLY, ΔLC, ΔLX, ΔLG, ΔLD and ΔLF

H_0: unit root: H_1: no unit root

Variables	Δ^2LY	ΔLC	ΔLX	ΔLG	ΔLD	ΔLF
DF	-7.044*	-6.132*	-7.488*	-4.481*	-4.327*	-6.052*
ADF	-4.905*	-4.118*	-4.128*	-3.675*	-3.497*	-3.671*

LY means log of Real GDP; LC means log of Real Private Sector Credit. LX means log of Real Total Exports. LG means log of GDP per Capita. LD means log of Ratio of Bank Deposit to GDP. LF means log of Ratio of Private Sector Deposit to GDP. Δ means growth in the real variable and D before the variable means first difference of the growth of that variable.

The result of models 1 and 2 are in Table 3.2 below. In order to establish the direction of causality based on the time series result, both the economic growth and financial sector variables are used as dependent variables separately for the two models.

Table 3.2 - ECM REGRESSION RESULT 1970-2005

Model No / Dependent Variable	**1a/** Δ^2LY_t	**1b/** ΔLC_{t-1}	**2a/** Δ^2LY_{t-1}	**2b/** ΔLC_{t-1}
Intercept	0.014 (0.337)	0 .004 (0.763)	0.018 (0.203)	-0.009 (0.474)
Δ^2LC_{t-1}	0.016 (0.811)	-0.768 (0.616)	0 .029 (0.619)	-0.524** (0.001)
Δ^3LY_{t-1}	-0.524* (0.038)	0.003 (0.977)	-0.520* (0.031)	0.157* (0.042)
Δ^2LX_{t-1}			0.074 (0.137)	-0.166** (0.001)
ECM	0.025 (0.610)	-0.953** (0.000)	0.052 (0.215)	-0.188** (0.000)
R2	0.151	0.648	0.211	0.666
DW	1.814	1.952	1.649	2.216
DIAGNOSTIC TESTS				
LM Test	2.526 (0.112)	0.619 (0.431)	0.361 (0.548)	1.508 (0.219)
Ramsey	0.103 (0.748)	0.305 (0.580)	0.280 (0.597)	0.316 (0.582)
Normality	17.033* (0.000)	0.494 (0.781)	29.209* (0.000)	0.367 (0.832)
Heteroscedasticity	1.100 (0.294)	2.246 (0.134)	0.929 (0.335)	0.042 (0.837)

*LY means log of Real GDP; LC means log of Real Private Sector Credit; LX means log of Real Total Exports while Δ means growth in the real variable and D before the variable means first difference of that growth of that variable. Figures in parenthesis represent the p-values of the variables in the regression while ** and * depicts 1% and 5% level of significance for the coefficients respectively. * in the diagnostic section denotes significance at 5% level*

In the error correction model (ECM) regression output (1a) where proxy for growth is the dependent variable, only its lag is significant, but with a negative coefficient. The negative sign is as expected as it depicts the short run adjustment of the variable to the dependent variable. However, the model fails normality test hence has to be interpreted with caution. In model 1b where proxy for financial development is the dependent variable; the lag of the dependent variable is has a negative coefficient (as expected according to table 2.3 above which provided the empirical justification for the use and sign of the variable), but not significant. The non-significance of the lag of the dependent variable possibly suggests omission of variable because the other variable included is insignificant too, but the ecm coefficient of 0.953 is significant at 1%. This suggests that it will take about eleven months for the adjustment done in the regression to take place. The model satisfies all diagnostic requirements.

Despite the inclusion of export in model 2a when proxy for growth is the dependent variable, the result is similar to model 1a. The lag of the dependent variable has negative coefficient (as expected according to table 2.3 above which provided the empirical justification for the use and sign of the variable) and significant at 5%. The model fails normality test while the included variables are not significant either. Therefore, the model has to be interpreted with caution. Model 2b shows a better result than that of model 1b. All the variables included except the intercept are significant. This implies that the lag of credit to the private sector, output and experts are important in stimulating financial development. The ecm coefficient (0.188) is large and significant at 1%. This implies that it will take about two months for the adjustment done in the regression to take place. However, the coefficient for export is negative. This runs contrary to literature, but I explain this as the outcome of the resource curse effect on the country. The leaders siphon most of the exports proceeds while the remaining does not pass through the deposit money banks that are the main engine for financial intermediation in the country. Most of the funds siphoned are kept in banks outside the country while others keep their loot within the country, but away from the local banks, as they are not willing to account for the source of such funds if called upon to do so.

The critical observation from the four regressions discussed above is that when proxy for growth presented in the log form or the lagged values is the dependent variable, it

fails normality test. This may mean incorrect specification of the model. The second models with private sector credit as dependent variable has the coefficient for the lag of the dependent variable negative and tiny, but significant at 1%.. The ECM coefficient for these models is large and significant at 1% each.

Models1b and 2b satisfies all ordinary least square assumptions. Specifically model 2b has all the variables for economic growth and exports are significant while model 2a is not. This observation may suggest a situation of reverse causation between bank credit and economic growth in Nigeria. However to empirically confirm this assertion, model 3 developed by Demetriades and Hussein (1996) is used. As earlier stated, the Johansen method for establishing cointegration is favoured, as this is capable of detecting more cases of cointegration tests than the Engle-Granger approach. I present the result in table 3.3 below.

Table: 3. 3 Johansen Cointegration tests

	Trace Statistics			
Variables	k=1	k=2	k=3	k=4
LG, LD	23.77***	20.60***	15.89**	16.38**
LG, LF	*23.12***	*17.25***	*14.66**	*16.05***

*LG – log of GDP per Capita, LD – log of Ratio of Bank Deposit to GDP, LF – log of Ratio of Private Sector Deposit to GDP; K= number of lags; Results are based on one lag of each variable. Null hypothesis: r=0; Alternative: r=1; while *, ** and *** means significance at 10%, 5% and 1% levels respectively*

The result shows that financial sector variables cointegrates with real GDP per capita from lag one thus the hypothesis of no cointegration is rejected for all the variables. It means that there exists stable relationship between the financial sector indicators and real GDP per capita. The outcome of this result makes it possible to conduct Granger Causality test and the ECM causality tests using the Johansen method.
The Granger Causality test we estimate for each pair of variables is –

$$LG_t = \mu_0 + \mu_1 LG_{t-1} + \mu_2 LG_{t-2} + \beta_1 LF_{t-1} + \beta_2 LF_{t-2} + \varepsilon_t$$
$$LG_t = \mu_3 + \mu_4 LG_{t-1} + \mu_5 LG_{t-2} + \beta_3 LD_{t-1} + \beta_4 LD_{t-2} + \varepsilon_t$$

where: - LG represents log of GDP per Capita, LD represents log of Ratio of Bank Deposit to GDP, LF represents log of Ratio of Private Sector Deposit to GDP and ε represents the stochastic disturbance term. Granger Causality will be established if the coefficient β is non-zero or otherwise. The test is carried out based on two lags of the variables and data ranges from 1970 to 2005.

The result of the short run Granger Causality in Table 3.4 below shows that there is no relationship in the short run between the two pairs of variables. These variables are log of GDP per Capita (*LG)* and log of ratio of Private Sector Credit to GDP (*LF*) on one hand and log of GDP per Capita (*LG)* and log of ratio of Bank Deposits to GDP (*LD*) on the other. Despite this observation, the findings cannot be conclusive; it only serves as a starting point for further empirical tests, which the Johansen ECM method intends to accomplish.

Table 3.4- Results of Short run Granger Causality test

Variables	Outcome	Variables	Outcome
LG ⟶ *LF*	Null Hypothesis accepted	*LF* ⟶ *LG*	Null Hypothesis accepted
LG ⟶ *LD*	Null Hypothesis accepted	*LD* ⟶ *LG*	Null Hypothesis accepted

Hypothesis: - Null: no causation; Alternate: causation; K= number of lags =2;
N = 33;

Table 3.5 Results of ECM tests with Johansen cointegrating vectors between LG and LF; LG and LD

Variables	$\beta_{12}=0$	$\alpha_1=0$	$\beta_{12}=\alpha_1=0$	Variables	$\beta_{21}=0$	$\alpha_2=0$	$\beta_{21}=\alpha_2=0$
	$F(k, n_2)$	$t(n_2)$	$F(k+1, n_2)$		$F(k, n_2)$	$t(n_2)$	$F(k+1, n_2)$
LG ⟶ *LF*	7.527	6.565***	4.489***	LF ⟶ *LG*	3.433	0.188	3.696
LG ⟶ *LD*	2.554	7.761***	2.048***	*LD* ⟶ *LG*	2.202	3.199	2.640

*K= number of lags = 1; *** means significance at 1 level*
Hypothesis: - Null: no causation; Alternate: causation
n= number of observation = 33; n_2= n-2k-2

The result presented in tables 3.4 and 3.5 shows that the model accepts the hypothesis of no causality from real GDP per capita to the two financial development variables in the short run but rejects same at 1% level of significance in the long - run. As previously stated, where there is a variance in the results of Granger Causality and the Johansen method, the Johansen approach is preferred. This means that real output Granger causes

financial development. Therefore, the suggestion of reverse causation in the earlier models supports this result. Further examinations of the pair of the variables with the system equation using the seemingly unrelated regression method also buttress the above assertion. The equations that I test are stated below which anticipates a positive relationship between the proxies of growth and financial development as discussed in chapter two above and the result is presented in table 3.6 below. All the variables are significant at 1% while only the intercept for equation 1 and 2 are significant at 5%. The Adjusted R^2 is equally high which shows that the variables exert high influence over each other although the proxies for financial development and their respective lags exert greater influence on growth. The result aligns with the theoretical explanations above and supports strong relationship between financial development and economic growth.

SURE equations for the results in table 3.6 are: -

$$\Delta LG = C(1) + C(2)^{*}\Delta^{2}LG + C(3)^{*}\Delta LF + C(4)^{*}\Delta^{2}LF \quad (1)$$

$$\Delta LG = C(5) + C(2)^{*}\Delta^{2}LG + C(6)^{*}\Delta LD + C(7)^{*}\Delta^{2}LD \quad (2)$$

$$\Delta LF = C(8) + C(4)^{*}\Delta^{2}LF + C(9)^{*}\Delta LG + C(2)^{*}\Delta^{2}LG \quad (3)$$

$$\Delta LD = C(10) + C(7)^{*}\Delta^{2}LD + C(9)^{*}\Delta LG + C(2)^{*}\Delta^{2}LG \quad (4)$$

Table 3.6 - Seemingly Unrelated Regression (SUR) Result

Variables	Coefficient
C(1)	-0.363* (0.028)
C(2)	1.021** (0.000)
C(3)	-0.949** (0.000)
C(4)	0.763** (0.000)
C(5)	-0.307* (0.041)
C(6)	-0.942** (0.000)
C(7)	0.766** (0.000)
C(8)	-0.503** (0.005)
C(9)	-0.996** (0.000)
C(10)	-0.446** (0.006)
Adjusted R^2- Equation 1	0.994
Adjusted R^2- Equation 2	0.994
Adjusted R^2- Equation 3	0.852
Adjusted R^2- Equation 4	0.827
No of Observation	35

*Note: Figures in parenthesis ( ) are the p-values of the variable while ** and * depicts 1% and 5% level of significance for the coefficients respectively. LG represents log of GDP per Capita, LD represents log of Ratio of Bank Deposit to GDP, LF represents log of Ratio of Private Sector Deposit to GDP.*

3.6 MODEL SPECIFICATION – FACTORS DETERMINING THE GROWTH OF CREDIT IN NIGERIA

To establish the factors that drive credit growth, I use the variables developed by Crowley (2008) in the case of credit growth in the Middle East, North Africa and Central Asia region (model 4). Attempts to use Private Sector Credit deflated by Gross domestic Product in the model results did not work. We adopt the ECM, which presents the lag of the dependent variable as part of the explanatory variable. With this approach, the models satisfy the various diagnostic tests. We use real values and exclude inflation from the list of variables.

The model that we test in this study is -

$$Real\ Private\ Sector\ Credit\ Growth_t = f(\beta_0 + \beta_1 \Delta Real\ Domestic\ Product\ Growth_{t-1} + \beta_2 \Delta\ Real\ Private\ Sector\ Credit\ Growth_{t-1} + \beta_3 \Delta\ Real\ Trade\ Growth_{t-1} + \beta_4 \Delta\ Real\ Total\ Capital\ Account\ Growth_{t-1}\ \ model\ 4$$

where: - β_0 denotes Constant; Real Trade Growth is used to proxy total exports, oil exports, nonoil exports, total imports and net trade while Real Total Capital Flow is used to proxy foreign capital flow.

This model assists us to establish the factors that drive credit growth in the country. The data used in this study are annual, covering a period of thirty six years between 1970 and 2005, and obtained from the International Financial Statistics (IFS) site and the Statistical Bulletin of the Central Bank of Nigeria (December, 2006. The model developed by Crowley (2008), which has financial development as the dependent variable fits properly for the purpose of this research. The aim is to establish the factors that drive credit growth in the country. The model uses real values of the variables and the Error Correction Method (ECM) to determine the relationship. Private Sector Credit is the dependant variable and the result presented in Table 3.7 and 3.8 below.

Table 3.7 - ECM REGRESSION OUTPUT OF CREDIT GROWTH, 1970-2005

Model No	1	2	3	4	5
Intercept	0 .004 (0.763)	-0.009 (0.474)	-0.001 (0.910)	-0.005 (0.643)	-0.002 (0.833)
Δ^2RPSCR	-0.768 (0.616)	-0.524** (0.001)	-0.497** (0.003)	-0.531** (0.000)	-0.466** (0.000)
Δ^2RGDP	0.003 (0.977)	0.157* (0.042)	0.148* (0.034)	0.135 (0.057)	0.144* (0.040)
Δ^2REXP		-0.166## (0.001)	-0.025 (0.513)		
Δ^2RCAPAC			0.0002** (0.000)	0.0002** (0.000)	0.0002** (0.000)
Δ^2RIMP				0.063 (0.117)	
ECM $_{t-1}$	-0.953** (0.000)	-0.188** (0.000)	-0.040** (0.000)	0.033** (0.002)	-0.019** (0.000)
R^2	0.648	0.666	0.742	0.739	0.730
DW	1.952	2.216	2.078	2.001	2.041

*Note: Figures in parenthesis ( ) are the p-values of the variables. The symbols of ** and * depicts 1% and 5% level of significance for the coefficients and with the expected sign while ## and # also denotes significance at 1% and 5% level of significance but the sign of the coefficient does not tally with the literature. The symbol of * in the diagnostic section denotes significance at 5% or 10% level.*
KEY: - RPSCR is Real Private Sector Credit; REXPOIL is Real Export of Oil; RGDP is Real Gross Domestic Product; REXPNOIL is Real Export of Non Oil; RIMP is Real Import; REXP is Real Total Export; RCAPAC is Real Total Capital Flow

Table 3.8- DIAGNOSTIC TESTS FOR THE ABOVE REGRESSIONS

Model No	**1**	**2**	**3**	**4**	**5**
LM Test	0.619 (0.431)	1.508 (0.219)	0.411 (0.521)	0.084 (0.771)	0.267 (0.606)
Ramsey	0.305 (0.580)	3.016 * (0.082)	0.033 (0.855)	0.255 (0.613)	0.139 (0.710)
Normality	0.494 (0.781)	0.367 (0.832)	3.899 (0.142)	5.734* (0.057)	4.121 (0.127)
Hetero	2.246 (0.134)	0.042 (0.837)	0.778 (0.378)	0.971 (0.324)	0.710 (0.399)

3.7 INTERPRETATION OF RESULTS - FACTORS DETERMINING THE GROWTH OF CREDIT IN NIGERIA

From the above tables, almost all the models satisfy the Ordinary Least Square requirements. The coefficient for the intercept was very tiny and negative in all the results except model one, which is positive, though still tiny. This runs contrary to the findings of Crowley (2008) because the coefficient for intercept is large in his results. The autoregressive coefficient for real private sector credit growth was negative and large in all the results except in the first model that tested the bivariate relationship between credit and real output. The coefficient was not significant, but negative. As explained earlier, I expect the negative sign as it depicts the short run adjustment on the dependent variable. Similarly, the coefficient for real gross domestic product growth was positive and significant in all the regressions while the ECM coefficient is significant in all the models. The significance of the ECM further affirms the existence of long run relationship between the variables and that some adjustments take place within the current period based on the disequilibrium of the previous periods for each model.

The ECM coefficient for the first model is large and significant at 1%. This suggests that the pair of real private sector credit growth and real gross domestic product growth alone is not sufficient to explain the relationship that exists between financial development and growth. For the second model, both real private sector credit growth and real export growth were significant at 1% with large coefficient of -0.524 for real private sector credit growth and small coefficient of -0.166 for real total export growth respectively. The negative sign for the coefficient of export follows the argument proffered above. The ECM is significant at 1% while real output is significant at 5%. This result runs contrary to the findings of Crowley because real total export growth is

not significant in his study. This result instead affirms the findings by Frankel and Romer (1999) that exports are significant for financial development, though in this case shows an inverse relationship.

In the third model, I include real capital inflow to model two. Both real private sector credit and real GDP follow the same pattern as explained in model two. However, real export is insignificant with a negative coefficient while real capital inflow has a tiny coefficient, but significant at 1%. The ecm coefficient is -0.40 which implies that the speed of adjustment will take about 5 months. In model four, I remove real export and include real import. Both real private sector credit and real GDP follow similar pattern as explained in above, though real GDP is now significant at 10%. The addition of real imports to model three made no significant change to the result. The model fails normality test, further affirming the importance of foreign inflow as a significant variable in stimulating financial development. The coefficient of real import is positive, but not significant while the coefficient for real capital inflow is not different from the model with the inclusion of real export.

Due to this observation, I then present model five by excluding real import. All the variables were significant including the ECM at 1%, while R^2 and DW were about 73% and 2.041 respectively. The coefficient of real capital flow does not exhibit any significant change from that of model three and four. The coefficient for real private sector credit growth is large at -0.466. This shows that foreign capital flow is highly significant in enhancing credit growth within the economy, though the coefficient is tiny. The findings show that a one percent increases in real total capital flow will cause about two basis point increase in real private sector credit. This is different from the findings of Crowley (2008) who finds that foreign capital flow was not significant, thus concluding that foreign capital is not an important determinant of financial development in the countries that we study. However, the result supports the findings of Arvai (2005) and Duenwald et al (2005) that foreign inflows are important in driving credit growth. In view of this, I postulate that real capital inflow is the single variable that exerts significant impact on financial development.

I investigate further to find out why the coefficient for trade is negative in the results. As earlier mentioned, Nigeria is a country that is dependent on oil export revenue. I divide the exports of the country into oil export and non-oil export and regressed this in separate regressions. The result presented in table 3.9 below shows that the coefficient of oil export is negative and significant at 5% while that of non-oil export is positive and significant at 5% too. With this result, I confirm that the export of oil is responsible for the negative coefficient observed in this study. This implies that while export of non-oil passes through the intermediation process, which aids financial development, export of oil, misses this process due to the reasons earlier discussed in this study. When exports is replaced with imports, the result is better than with oil exports inclusion because imports has a positive relationship (as expected and shown in table 2.3 above where the empirical explanation justifying inclusion and the sign is stated) with financial development similar to the result with the inclusion of non-oil exports. The explanation is similar to that of non-oil experts

Table 3.9 - ECM REGRESSION OUTPUT FOR OIL, NON-OIL EXPORTS AND IMPORTS WITH CREDIT GROWTH AS DEPENDENT VARIABLE (1970-2005)

Model No	**6**	**7**	**8**
Intercept	-0.006 (0.649)	-0.010 (0.422)	0.004 (0.785)
Δ^2RPSCR	-0.659** (0.000)	-0.262 (0.087)	-0.512** (0.002)
Δ^2RGDP	0.241** (0.006)	0.077 (0.371)	0.213* (0.013)
Δ^2REXPOIL	-0.147## (0.011)		
Δ^2REXPNOIL		1.837* (0.034)	
Δ^2RIMP			0.142* (0.012)
ECM_{t-1}	0.171* (0.021)	-0.608** (0.001)	-0.023 (0.506)
R^2	0.571	0.631	0.581
DW	2.314	2.180	2.208

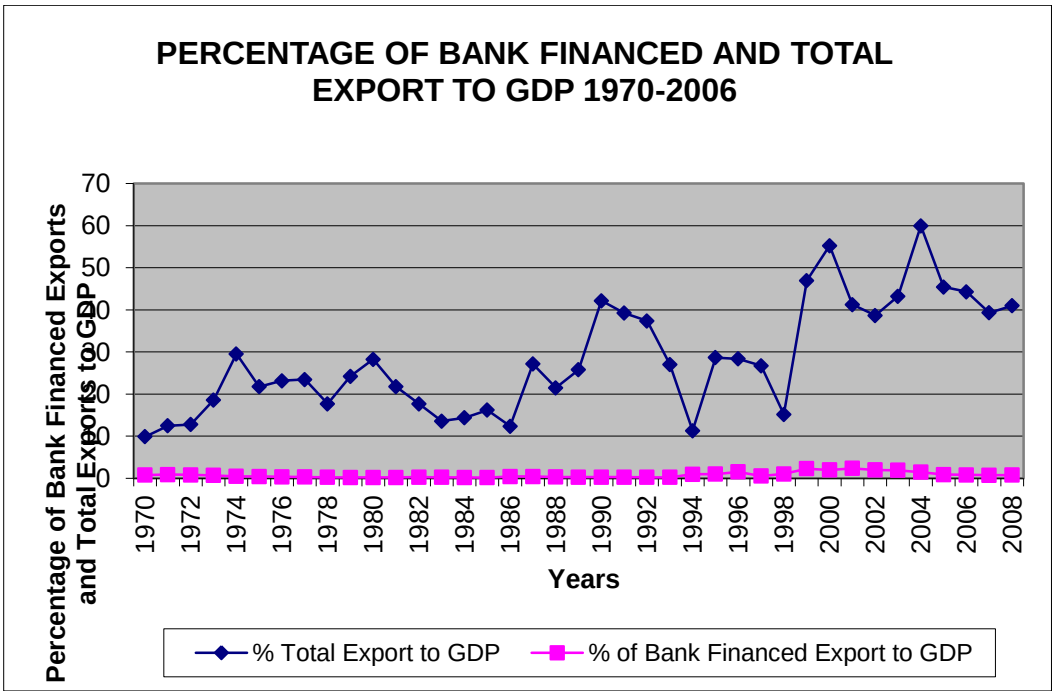
*Note: Figures in parenthesis ( ) are the p-values of the variables. The symbols of ** and * depicts 1% and 5% level of significance for the coefficients and with the expected sign while ## and # also denotes significance at 1% and 5% level of significance but the sign of the coefficient does not tally with the literature. The symbol of * in the diagnostic section denotes significance at 5% or 10% level.*
KEY: - RPSCR is Real Private Sector Credit; REXPOIL is Real Export of Oil; RGDP is Real Gross Domestic Product; REXPNOIL is Real Export of Non Oil; RIMP is Real Import.

Table 3.10: DIAGNOSTIC TESTS FOR THE ABOVE REGRESSIONS

Model No	**6**	**7**	**8**
LM Test	4.450* (0.035)	1.627 (0.202)	0.649 (0.420)
Ramsey	1.030 (0.310)	0.117 (0.733)	2.128 (0.145)
Normality	1.487 (0.476)	0.996 (0.608)	0.956 (0.620)
Hetero	1.950 (0.163)	0.206 (0.650)	0.964 (0.326)

As earlier stated, when I include total exports growth in model three, there was no appreciable change to the result presented for model five while total export growth was not significant. One tends to question the importance of export as a variable in buttressing financial intermediation within this country. A graph representing the relationship is in figure 3.1 below:

Figure 3.1: Percentages of Bank Financed Exports and Total Exports to GDP (1970 –2008)

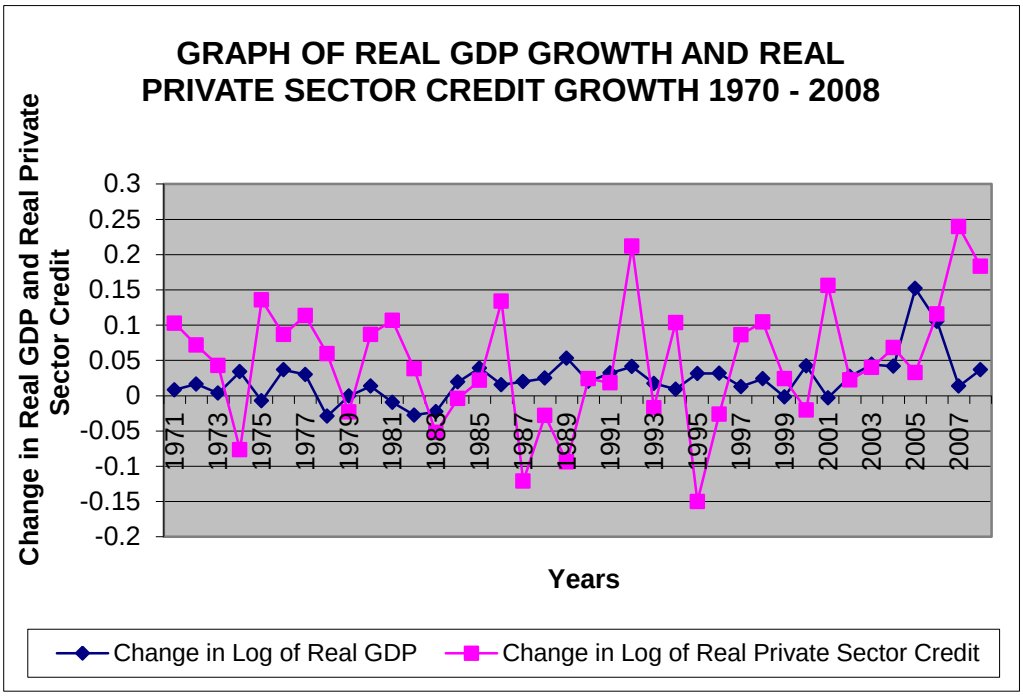


Source: - Data from CBN Statistical Bulletin 2009

From this graphical illustration, it can be seen that a very insignificant portion of total exports was financed by bank credit, hence the situation depicted in the model. A possible explanation is that exports from Nigeria are mainly crude oil, which the multi-national companies handle. They source for their funding from outside the country. The proceeds from these exports are not available for intermediation by the financial system because the Central Bank of Nigeria who is the banker to the government collects the proceeds for the government accounts. As such both the supply and demand aspect of exports finance is not available for financial intermediation. Total exports can only be significant for financial development when it is properly intermediated into the financial system. This therefore explains why real total capital flow may be better in explaining financial development in Nigeria than real total exports. The explanation is in addition to the natural resource curse earlier stated above.

From the above discussion, model five seems the one that best explains the relationship between financial development and economic growth. A critical observation in the result was that the coefficient for real private sector credit was negative in all the results except model one, which is in broad agreement with the findings by Crowley (2008). This observation made us to present both real private sector credit growth and real gross domestic product growth in figure 3.2 below and highlight that the variables exhibit high volatility. The graph also reveals that real gross domestic product growth exceeds real private sector credit growth. This is contrary to Crowley's (2008) finding that private sector growth exceeds gross domestic product growth in almost all the 23 MDC countries. Thus, we can postulate that the economy is growing faster than credit availability. This may be a reason for the reverse causation observed earlier.

Figure 3.2: Real GDP and Real Private Sector Credit Growth in Nigeria (1970 – 2008)

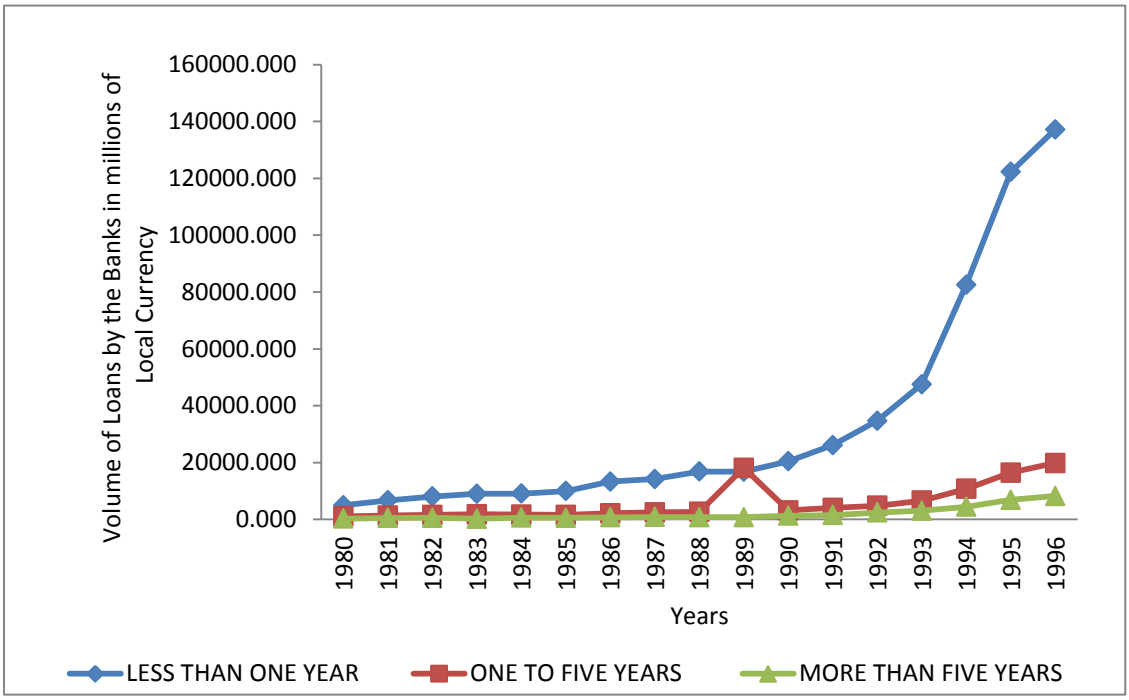


Source: - Data from IFS Database

From the result of model five, it emerges that a unit change in output results in about 14% change in real private sector credit. This low effect can be attributable to the fact that deposit money banks' credit is short tenured (as represented in figure 3.3 below) which to a large extent may reduce the ability of such credits to impact positively on the economy.

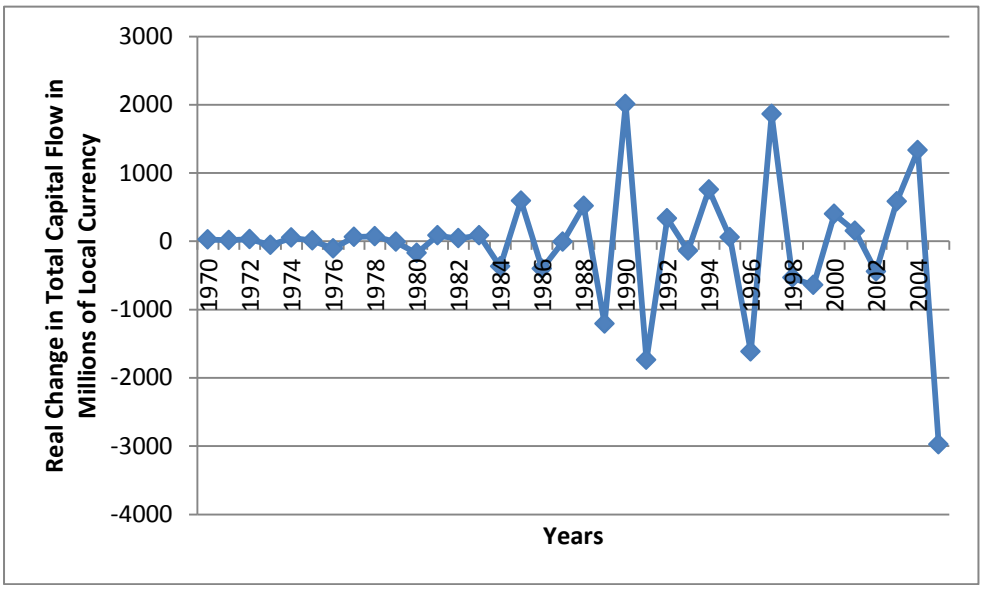
My findings identify foreign capital flow as a very significant factor in stimulating financial intermediation within the country. This foreign capital flow according to figure 3.4 below also exhibits high volatility, which is likely to have accounted to some extent for the high volatility observed with real private sector credit growth.

Figure 3.3: Maturity Structure of Bank Loans in Nigeria 1980 - 1996



Source: - Data from CBN Statistical Bulletin 2006;
Date limited because requirement for such disclosure was abolished since 1996

Figure 3.4: Real Total Capital Account Flow Growth (1970 – 2008)



Source: - Data from CBN Statistical Bulletin 2009

The volatility of foreign capital inflow suggests that it cannot sustain the financial system. The country needs to ensure proper relationship between total exports and financial development. Banks in the country need to be relevant to financing of oil export which accounts for the significant aspect of the country's total export. This will

assist the country to depend less on foreign capital flow, which exhibits high volatility, but on a more stable total export proceeds.

3.8 Conclusion

In this chapter, I examine the significance of growth variables in affecting the level of intermediation within the Nigerian economy. After using bivariate and multivariate models adopted in previous studies such as Ghirmay (2004) and Tang (2003), I suggest the existence of a possible reverse causation between real output and financial development. A further test with the aid of the model developed by Demetriades and Hussein (1996) further lends credence to that assertion. In an attempt to identify the factors that influence credit growth, I use the variables proposed by Crowley (2008) to analyse the relationship. The results show that contrary to previous studies, trade variable measured by total exports and export of oil (which accounts for a significant aspect of the country's total exports) does not support the development of the financial sector. Real total capital flow and export of non-oil are good in explaining this relationship.

The inability of exports to explain this relationship relates to the very insignificant percentage of exports funded by the financial industry and the natural resourse course argument. A large percentage of the country's exports are oil based which foreign multi-nationals who source their funds from outside the country dominate. Therefore, the intermediation role by banks in export finance is negligible. When they collect export proceeds, the government spends it, through the Central Bank who acts as the medium for both collection of proceeds and expenditure. This means that both the supply and demand for exports funding do not pass through the deposit money banks that are well positioned to intermediate for the real sector. Similarly, the level of corruption which sees some of the export proceeds diverted for personal reasons also accounts for this scenario. The government needs to ensure proper integration of the financial sector to be capable of substantially intermediating in the financing processes for the real sectors of the economy.

My results also suggest that real total capital flow has been highly volatile, which may account for the volatility in real private sector credit growth. Therefore, the country should ensure that the financial system intermediates fully for both the supply and demand aspects of export finance. This will ensure the relevance of trade variables in explaining the relationship that exists between economic growth variables and financial development. Similarly, they will need to intensify their efforts to improve non-oil exports, which have reduced drastically from 49.6% in 1970 to 1.7% in 2005. A sizeable improvement in this area will assist the relevance of this variable in explaining the relationship therein.

Finally, our results reveal that for the purpose of Financial Development in Nigeria, it is not where the economic activity (exports) is originating from that develops, but where intermediation for that economic activity originates from that develops. The result for Nigeria is puzzling, and depicts the under development nature of Nigeria. Does this situation apply to all countries in Africa? In the next chapter, I make similar findings in a panel study for African Countries.

CHAPTER FOUR

FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN AFRICA: LESSONS AND PROSPECTS

4.0 Introduction- The Role of Banks in Financial Intermediation

The finance literature provides support for the argument that countries with better and efficient financial systems grow faster while inefficient financial systems bear the risk of bank failure (Kasekende, 2008). In a review of finance literature, the study opined that better functioning financial systems ease the external financing constraints that impede firm and industrial expansion. Banks accept deposit from individuals and institutions thus transferring funds from the surplus sector to the deficit sector of the economy (Mishkin, 2007). Though they are subject to certain regulations by the regulatory authorities, financial intermediaries still determine the rules for allocating funds, and as such they play a significant role in determining the type of investment activities, the level of job creation and the distribution of income (Gross, 2001).

One of the studies that analyse the relationship between finance and growth is by King & Levine (1993a). The paper examine about eighty countries using a cross sectional data over 1960 to 1989. The countries included in the study are of varied level of development. It is argued that the wide disparity in the level of development of the countries may at best be a distortion against the poorly and highly developed economies (Levine, 2004). Secondly, the methodology used is classified as inadequate to capture the relationship in more detail (Demetriades & Andrianova, 2003). Since the discussion on causation is not yet settled, Demetriades & Andrianova, 2003 are of the opinion that the paper ought to address the issue. Finally, they comment on the inclusion of developing countries without including money outside the banking sector. Researchers are of the opinion that developing countries have large volume of liquid liabilities outside the banking system and omitting the variable is viewed as bias.

4.1 Relationship between Finance and Growth

The literature on the nexus continues to attract the importance of scholars finance and growth as stated in the previous chapter, Patrick (1966) postulated two types of relationship, which were Supply Leading hypothesis and Demand Following hypothesis. Subsequently, Demetriades & Hussein (1996) postulated the bi-directional relationship as the third.

The view of the Supply-leading hypothesis assumes that the intermediation activities of the financial institutions make the real sector to increase their productive capacity, which subsequently enlarges the productive base of the economy. As such finance is positive and significant in motivating growth. Notable scholars such as Schumpeter (1911), McKinnon (1973), Fry (1977), Ogundokun (1998), Neusser & Kugler (1998), Levine et al (2000), Calderon & Liu (2003) all support the supply leading hypothesis. The seminal work by King & Levine (1993a), which examined the relationship between finance and growth for about eighty countries postulated a robust and positive relationship with finance causing growth. Financial activities assist to reduce liquidity risk and allow the management of risks for savers and investors. It also assists to channel savings into long-term assets that are more productive than short-term assets. Thus by eliminating liquidity risks, banks can increase investment in high return illiquid assets which accelerate growth (Bencivenga & Smith, 1991). Likewise, financial system facilitates portfolio diversification for savers and investors. Thus, the more developed the financial system, the more choices is available to investors, thus enhancing a more efficient allocation of resources in productive activities (Demirguc-Kunt & Maksimovic, 1996).

This view is similar to Hao (2006) in the study of the Chinese economy posited that financial intermediation happens through the substitution of loans for state budget appropriation and the mobilization of household savings. Therefore, loan expansion does not contribute to growth if the loan distribution by the financial intermediaries is inefficient. The level of financial development is a predictor of future economic development and future productivity improvement (King & Levine, 1993a). The study by Boyreau – Debray & Genevieve (2003) emphasised the importance of focusing on

allocation of credit to the private sector, as opposed to all bank intermediation. The mobilizing and pouring of funds into the declining parts of the Chinese State Enterprise system has not been growth promoting. This infers that where the financial institutions channel funds does matter rather than the volume of lending that they give.

The proponents of demand leading hypothesis assume that the enlargement of the economy pushes the real sector to demand for fund from the financial institutions to meet up with the increase in productivity (Goldsmith, 1969; Gurley & Shaw, 1967). As a result, the economy pushes the financial institutions to intermediate. Robinson (1952) suggests that researchers' overstress the role of financial institutions, as such where enterprises leads, finance follows. He posits that financial institutions only respond passively to industrialisation and economic growth. This view is similar to Favara (2003) who postulated that the relationship between financial development and economic growth is at best weak. The study suggests that there is no clear indication that finance spurs economic growth; rather the relationship is puzzlingly negative, as financial development does not have a first order effect on economic growth.

The more recent postulation of bi-directional causation assumes that both financial development and economic growth exert influence on each other. Sequel to the Demetriades & Hussein (1996) study, other scholars (Ogundokun, 1998; Demetriades & Andrianova, 2004) has conducted studies that buttress this assertion.

4.2 Indicators of Financial Development and Economic Growth

Similar to the previous chapterthis study will focus on the role of private sector credit to drive growth. Several studies have adopted various measures of financial development. For example, Allen and Ndikumama (1998) in their study on financial intermediation and economic growth in Southern Africa used credit to the private sector, volume of credit provided by banks and liquid liabilities of the financial system (measured by M3). They posit that these variables, which are used to proxy financial development, are good measures of the efficiency with which the financial system allocates resources thereby stimulating growth.

King and Levine (1993a) use the ratio of liquid liabilities of the financial system to GDP, which they termed LLY; ratio of deposit money bank domestic assets to deposit money bank domestic assets and central bank domestic assets termed BANK. The ratio of claims on the nonfinancial private sector to total domestic credit termed PRIVATE and ratio of claims on the nonfinancial private sector to GDP termed PRIVY. According to the study, LLY represents the depth or size of the financial intermediaries and depict their ability to provide financial services. BANK is rather controversial. This they attributed to the fact that banks are not the only institutions that provide risk management and other related services, thus the distinction between deposit money banks and central banks is not very clear. Moreover, the variable does not measure the user of the fund that the banks lend to their customers. However, they are of the opinion that it could complement LLY.

PRIVATE is the variable that measures to whom the credit was allocated. They posit that a financial system that simply grants credit to government or state-owned enterprises may not be efficiently utilising the funds in the proper way like those that channel their funds to the private sector. Similar to this postulation is the reason adduced for introducing PRIVY. They are of the opinion that these two variables will provide opportunity to maximise information on financial development, though they may not accurately measure the level of financial services.

Oura (2008) used the ratio of external (bank) finance to total firm finance while Davis (2004) used four variables as indicators of financial development namely – stock market capitalisation, stock market turnover, listed companies and bank credit. Other studies have used stock market indicators, which indicate financial development for more advanced countries.

Generally, private sector credit is favoured by researchers as a proxy for financial development.. The importance attached to the use increases over time thus studies use different measures of the variable overtime (see for example Beck et al 2005; Levine 2002; Odedokun 1998; King and Levine 1993a). Boyreau-Debray (2003) uncovers a negative correlation between growth and banking debt due to the fact that Chinese banks were mobilizing and pouring funds into the declining parts of the Chinese State

Enterprise, and hence the system has not been growth promoting. Demirguc-Kunt and Levine (2008) emphasised the importance of focusing on allocation of credit to the private sector as opposed to all bank intermediation while Beck et al (2005) highlight the importance of private credit as a strong predictor of growth. The recent study by Crowley (2008) also supports this postulation.

A common feature of the developing countries is that there is little information about how the activities of the financial industry affect the respective economies. In essence, the factors that drive credit growth are largely not researched hence the contribution of the private sector credit to the growth of the economy may not be easily measured. This study will fill this gap by analysing the contribution of private sector credit to the growth of the continent and determine the factors that are economically significant for credit growth.

Other factors equally account for growth in the economy. The study by Frankel and Romer (1999) established the importance of trade in generating growth within the economy. They opune that trade proxied by total exports has a quantitatively large and robust positive effect on income and that a rise of one percentage point in the ratio of trade to GDP increases income per person by at least one-half percent. This they believe happens because trade appears to raise income by spurring the accumulation of physical and human capital; thereby increasing output for given levels of capital. African countries have various types of natural resources. These range from oil, agricultural products and other mineral resources. They export most of these endowments to other continents in the world. Based on the postulation of Frankel and Romer (1999) above, it is important to analyse the effect of trade on the growth of the countries within the continent.

Foreign inflow is another variable discussed in the literature that impacts growth but there is no consensus opinion about the effect so far. Crowley (2007b) finds that foreign inflows are significant for growth of credit in Slovak Republic. Several other previous studies support this assertion (Arvai 2005 and Duenwald et al 2005). However, Cottarelli et al (2003) posited that domestic savings flows is the main factor

responsible for the growth of credit in Eastern Europe, and as such there was no evidence that foreign inflows was significant in stimulating credit growth.

In determining the proxy for growth, the variables used are similar in the literature. Most of the variables represent different variations of GDP. Specifically, King and Levine (1993a) used per capita GDP, which they termed GYP; per capita physical capital formation termed GK; the efficiency of the financial intermediaries, which is termed EFF, and ratio of investment to GDP termed INV. GYP is a very popular growth indicator, which measures the real per capita growth rate in the quantity of total domestic production over a specific period. GK is a variable that measures the growth rate of the real per capita physical stock while EFF is to capture the residual from the two growth indicators mentioned above.

Specifically, the study used the production equation $y = k^{\alpha}x$, where y is real per capita GDP, k is the real per capita physical stock, α is the production parameter function and x is used to capture other factors that account for growth. This equation after transformation through log and differencing became $GYP = \alpha(GK) + EFF$. To analyse the relationship, they use a range of 0.2 to 0.4 to depict the value of α and eventually use 0.3 to calculate EFF reported. In essence, EFF is to measure other factors outside the GYP and GK that also contributes to growth within an economy. Such factors according to them include technological growth, human capital accumulation, increases in the number of hours worked etc. EFF can thus be termed the improvements in "efficiency". Different variations of the above-mentioned variables are reported in other papers too.

Inflation exhibits negative relationship to output. This is because in a period of inflation, households are prone to supply less labour as they will prefer to work less and rather engage in more leisure. Thus, for a given unit of capital, there is less production hence lesser output. This assertion falls in line with the empirical evidence provided by McCandles & Weber (1995) and Barro (1995). Another school of thought sees inflation as a tax on investment hence a disincentive for investment (De Gregorio, 1993; Stockman, 1981) thus high inflation reduces investment hence low growth. Inflation also disrupts financial intermediation by discouraging long-term contracting, increasing

moral hazard problems in the financial institution (McKinnon, 1973). Thus high inflation results in greater uncertainty in the financial sector in making efficient allocation of resources mostly in the long run.

Lastly, the role of banks as agents for growth is been supported by many studies discussed in this paper. Though there are some contrary evidences, they are few when compared to those in support of the proposition. Secondly, many studies support the existence of a long run relationship between finance and economic growth. What seems unsettled is the issue of causality between the two variables. However, the efficiency of the system rather than the volume of financial activities are vital to facilitate development. It therefore becomes very important to allocate funds to their most productive uses.

This study uses the variables defined by King and Levine (1993a) as stated above though subject to limitation of data, which caused the exclusion of their measure for investment (INV) and the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets (BANK).

4.3 EMPIRICAL INVESTIGATION

Research Question

Based on the aforementioned, it may be apt to state the research questions as follows:-

1) Is financial development important for generating growth within the Less Developed Countries notably African Countries?

2) What factors are significant in determining the growth of credit within the Continent?

Data

The data for this study is from the World Development Indicator (WDI) 2008 dataset and the International Financial Statistics (IFS). The study covers thirty – one[2] African Countries for the first research question and thirty – three[3] African countries for the second question. Essentially, this study only uses three of the earlier mentioned

financial intermediation variables namely LLY, PRIVATE and PRIVY due to unavailability of data. LLY is the ratio of liquid liabilities (M3) to GDP, is to measure in part the size of the financial intermediaries hence the ability to provide financial services. The second variable used is PRIVATE. It measures the ratio of Private Sector Credit to Domestic Credit of the Deposit Money Banks. As earlier mentioned, this variable is able to capture the source of allocation of funds and the quantity of total financial intermediation that that the banks lend to the growth-promoting sector of the economy. The last variable used to proxy financial intermediation is PRIVY. This measures the ratio of Private Sector Credit to GDP.

For the growth variables, I use three of those defined by King and Levine (1993a) in the study. The variables are GYP, GK and EFF. The reasoning behind the choice of these variables is similar to that of King and Levine (1993a) above.

Table 4.1: A summary statistics on these variables is presented below

	Financial Intermediary Development				Growth		
	LLY	PRIVATE	PRIVY	LLYO	GYP	GK	EFF
Mean	0.418	0.679	0.436	0.076	1.782	2.242	1.124
Minimum	0	-0.436	0	0	-0.434	-2.525	-0.613
Maximum	25.907	15.474	72.737	0.316	4.905	5.737	3.686
Std. Dev	1.512	0.748	3.907	0.048	1.009	1.528	0.805
No of obs	651	645	651	651	651	632	632

KEY: - GYP is Real per capita GDP Growth rate; GK is Real per capita Fixed Capital Formation Growth rate; EFF is defined as GYP – (0.3)GK; LLY is Liquid liabilities to GDP; Private is private Sector Credit to Domestic Credit; Privy is Private Sector Credit to GDP and LLYO is Money outside the Deposit Money Banks.

The summary statistics in table 4.1 above shows that the level of financial development within the continent is extremely poor, so also the level of growth attained. The mean values for financial development proxies are very small when compared to the mean values of the proxies for growth. The figure of standard deviation for all the variables (except LLYO) also show that the disparity or variance amongst these countries is wide thus signifying that most of the countries not really close to the mean values. The situation is different for Money outside the Deposit Money Banks, which has small figure for the measure of dispersion. This means that most of the countries included in the study have a sizeable percentage of money in circulation that is outside the banking system. However, the growth proxies do show some difference from the above highlights. The mean and minimum values are relatively much better (though with lots

of room for improvement). The standard deviation follows similar pattern with the financial variables, thus implying that there is wide disparity in the level of growth attained by each country.

The first part of the analysis deals with the question of the relevance of financial development in enhancing growth within the continent and the type of relationship that exists between them. The sample covers the period 1985 to 2005 for thirty – one countries in Africa. The second part of the analysis that uses thirty-three African countries covers the period from 1970 to 2006 and examines the second research question that looks into the factors that are important in stimulating financial development in Africa. Availability of data underlies inclusion of countries in this study.

4.4 Methodology

There are several methods available in the literature to determine the relationship between finance and growth. These include cross-country growth regression used by King and Levine (1993a); panel techniques used by Rioja and Valev (2003) and time-series used by Demetriades and Hussein (1996). For cross-country studies, panel method of analysis is an appropriate tool, mainly because it combines cross section and time series data. It is also capable of reducing multi-collinearity amongst the explanatory variables, which improves the efficiency of the econometric analysis. In view of this, we use panel methodologies to estimate the relationship between the variables.

In addition, we examine the causal relationship that exists between financial development and economic growth, an area, which the study referred to above, does not cover. The growing literature in this area makes the approach essential. To do this, the dynamic panel methodology is useful for this purpose. This method according to Habibullah and Eng (2006) has several advantages over cross-sectional or time-series as earlier discussed.

According to Girma (2008), Ordinary Least Square (OLS) estimation is likely to be biased and inconsistent when used alone for testing causal relationships between economic variables. He proposes, the IV/GMM method of estimation as capable to offer the chance of testing this.

In a model where: -

$$Y = \alpha + \beta X + \varepsilon$$

For the OLS to be unbiased, the matrix of regressors X and the error term ε should be uncorrelated. In essence,

Cov (X, ε) = 0; this implies that the regressors are exogenous. However, when at least, one of the regressors are correlated with ε,

$$\text{Cov}(X, \varepsilon) \neq 0$$

In this case, the regressors are the endogenous variables because they correlate with the error term. In this situation, the OLS estimation of β will be biased and inconsistent when: - There are several regressors and only one of them is endogenous. In order to correct for this, some additional variables that helps to obtain a consistent estimator of β are called instrumental variables (assume Z). These instruments must satisfy two properties. These are -

- Instrument relevance - The instruments have to correlate with the endogenous variable.

  $$\text{Cov}(X, Z) \neq 0$$

- Instrument validity (exogeneity) - The instruments have to be uncorrelated with the error term ε

  $$\text{Cov}(Z, \varepsilon) \neq 0$$

In essence, the instruments will only affect the dependent variable (Y) indirectly through the endogenous variables (X); as such, the instruments will not be part of the model.

With the choice of variables used in the main study of reference in this work, the approach requires choosing each of the financial development proxies which are endogenous in this study against each of the growth proxies which are termed

dependent variables and vice versa. It therefore implies that for each model, there will be one endogenous variable. The correlation statistics result presented later on in the study lends credence to this. This model therefore fits properly the above description and requirements for IV/GMM method of estimation hence used for this study.

The study starts with the two-stage GMM estimation, using the ivreg2 command in Stata. One peculiar feature of this approach is that the method is able to fix the requirement for instrumental variables as essential results relative to that will confirm the possibility of using such instruments or otherwise. Secondly, the Shea's partial R^2 provides additional test to confirm the relevance of the instruments. This test assists us to confirm whether the instruments explain properly the endogenous variable. We consider other tests such as the weak, under and over identification of instruments and report on them in the result profile. In addition to that, I also use the OLS fixed effect method of estimation as a robustness check. All essential tests as discussed above and relevant to this approach were taken into consideration and report them in the table of results.

In this study, the variables used in the study by King and Levine (1993a) are used to determine the relationship that exists between the proxies for growth and financial development. The study will use the GMM panel method to be able to explore causation, endogeneity and other advantages associated with the use of that method.

The determinants of credit growth are a prominent discussion in the credit literature as earlier stated. What is very clear is that, there is no universal model for dealing with this issue. According to Rioja and Valev (2003) in their study of seventy-four countries divided into three regions of low, medium and high based on the level of their financial development. They find that what appears not to have statistical significance in one area may have a positive significant effect in other areas, even with varying degrees of significance. According to them, financial development can only exert positive influence only when it has reached a threshold, thus the situation with the low region (developing economies) is uncertain mainly because it is below the threshold.

The King and Levine (1993a) approach is further supported by the multivariate model developed by Crowley (2008) to determine this relationship. The study adopts a cross-country regression approach to determine the factors that are crucial in driving credit growth within the Middle East, Mediterranean North Africa and Southwest Former Soviet Union countries of Central Asia. Similar to the reasons adduced above, I shall make use of the panel method of estimation.

4.5 ANALYTICAL METHOD AND MODEL FORMULATION

The first research question shall be analysed hereunder while the second question shall follow immediately after.

Research Question 1 – IS FINANCIAL DEVELOPMENT IMPORTANT FOR GROWTH IN AFRICA

In estimating the relationship, the study uses some of the variables proposed by King and Levine (1993a). In that study, they represent both financial development and growth by four different proxies each, three of which are used respectively in this study due to limitation imposed by data unavailability. The first proxy for financial development is the ratio of liquid liabilities to GDP (LLY); the second is the ratio of credit to the private sector to domestic credit (PRIVATE); the third proxy is the ratio of credit to the private sector to GDP (PRIVY) and the last is ratio of money outside the deposit money banks to GDP (LLYO).

The variables used as proxy for growth as defined by King and Levine are per capita GDP (GYP); per capita rate of physical capital formation (GK); and the residual after controlling for physical capital accumulation (EFF). This is the difference between GYP and 0.3 of GK. All the variables are in their log form. The combinations of the variables used in the model are stationary at level as reported in the cointegration result reported in table 4.2 below.

Table 4.2: Cointegration Result for the Variables used in the Models

No of CE/Variable Combination	GYP/ LLY	GYP/ PRIVATE	GYP/ PRIVY	GK/ LLY	GK/ PRIVATE	GK/ PRIVY	EFF/ LLY	EFF/ PRIVATE	EFF/ PRIVY
None *	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.001
At most 1 *	0.096	0.012	0.012	0.162	0.107	0.013	0.051	0.036	0.015
At most 2 *	0.192	0.052	0.019	0.422	0.271	0.062	0.111	0.044	0.039
At most 3	0.148	0.247	0.063	0.682	0.580	0.275	0.409	0.118	0.232
At most 4	0.109	0.139	0.074	0.541	0.790	0.566	0.098	0.097	0.073

Figures reported are the p-value for each combination. Each combination includes other exogenous variables which are Govt (ratio of government spending to GDP), Trade (ratio of trade (exports plus imports as a % of GDP), and Inf (Inflation rate)

The relationship that exists between the proxies for growth and financial development are as revealed in the correlation result presented in table 4.3 below.

Table 4.3: Correlation Result between Proxies for Growth and Financial Development Variables

Variables	LLY	PRIVATE	PRIVY	LLYO
GYP	0.362 (0.000)	0.143 (0.000)	0.452 (0.000)	0.065 (0.103)
GK	0.527 0(.000)	0.130 (0.001)	0.438 (0.000)	0.076 (0.059)
EFF	0.155 (0.000)	0.124 (0.002)	0.341 (0.000)	0.034 (0.386)

KEY: - GYP is Real per capita GDP Growth rate; GK is Real per capita Fixed Capital Formation Growth rate; EFF is defined as GYP – (0.3)GK; LLY is Liquid liabilities to GDP; Private is private Sector Credit to Domestic Credit Privy is Private Sector Credit to GDP and LLYO is Money outside the Deposit Money Banks. P-value in parenthesis ()

From Table 4.3, all the financial development variables are highly correlated the various proxies for growth. The only exception is money outside the coffers of the deposit money banks (llyo) which exhibits weak correlation (at 10%) with GK and no correlation with both GYP and EFF. As a result of this observation, I drop money outside the banking system from the list of variables that I use for the panel regression. It is noteworthy however, that despite the large amount maintained by the countries in form of money outside the banking system, it has no appreciable relationship with the growth proxies. It again justifies the decision of King and Levine not to include it in the list of variable used for their analysis.

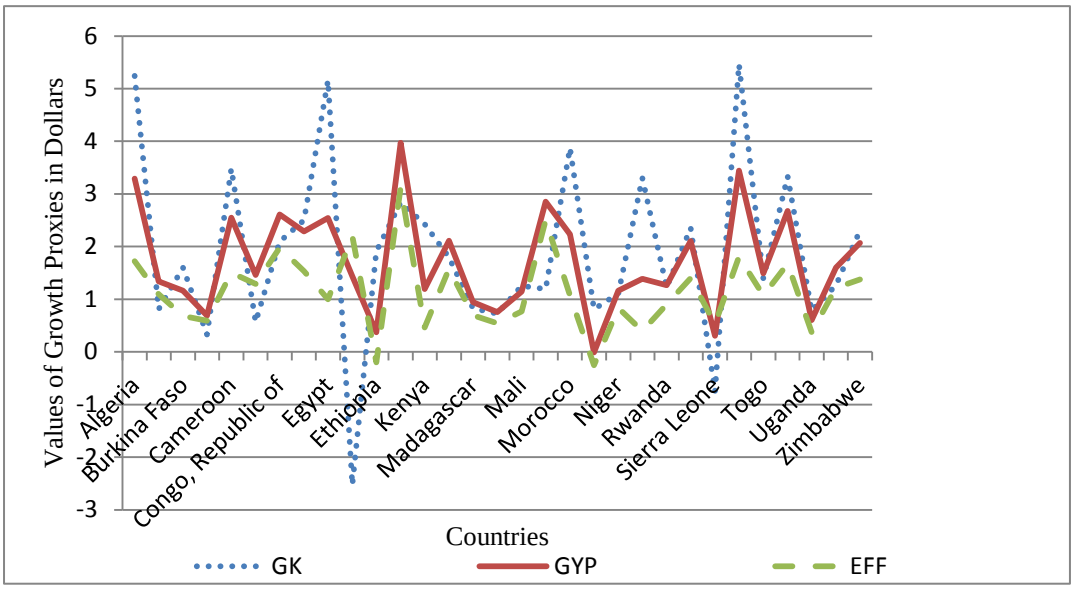
Table 4.4: Correlation Result for the Proxies of Growth

Variables	GYP	GK	EFF
GYP	1.000		
GK	0.635 (0.000)	1.000	
EFF	0.898 (0.000)	0.231 (0.000)	1.000

KEY: - GYP is Real per capita GDP Growth rate; GK is Real per capita Fixed Capital Formation Growth rate; EFF is defined as GYP – (0.3)GK. P-value in parenthesis ()

Furthermore, I examine the correlation of the growth proxies and the result presented in table 4.4 above shows that the variables are highly correlated at 1% with each other. An inclusion of all the variables in the regression together will result in multi-collinearity hence a justification for our approach to include the each of the proxies in separate regression. When I chart these variables as shown in figures 4.1 and 4.2 below for 1985 and 2005 which covered the entire period of the analysis, the high level of correlation amongst them is readily visible.

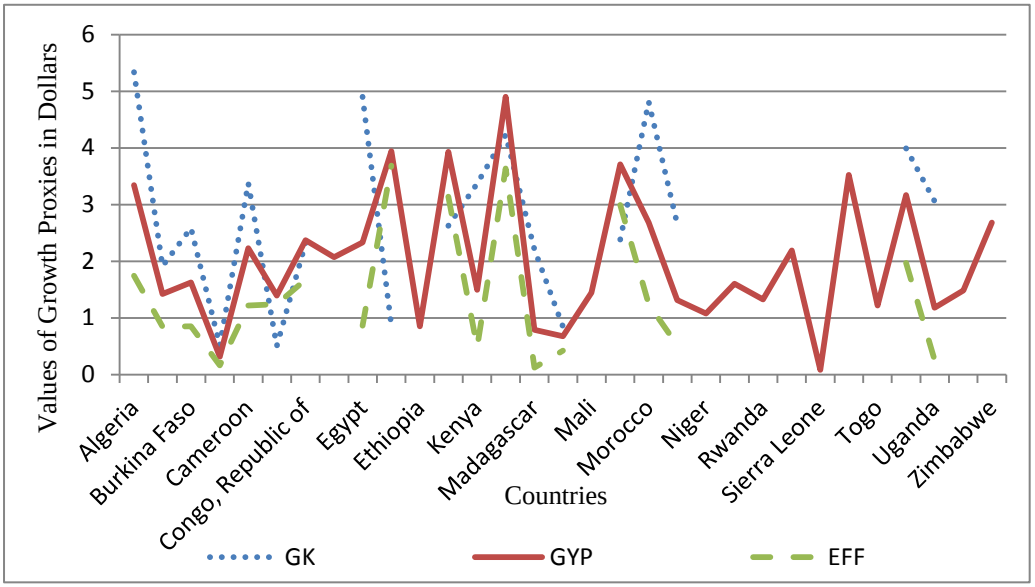
Figure 4.1: Growth Proxies for African Countries in 1985



Source: The World Bank Development Indicator (2007)

From the above chart, it shows that the three variables move together in most of the cases. Few countries such as Egypt, Rwanda mostly with EFF do not have the same relationship as seen with other countries.

Figure 4.2: Growth Proxies for African Countries in 1985



Source: The World Bank Development Indicator (2007)

I examine the relationship between financial development and growth as earlier mentioned using a panel data approach for the reasons earlier adduced. The GMM method is used for the analysis. The estimation of the regressions includes each of the financial development variables along with some other variables that are relevant in view of recent empirical studies on growth. Such variables includes ratio of government spending to GDP termed GOVT and ratio of trade (exports plus imports) to GDP and termed it TRADE. All variables are as defined according to King and Levine (1993a). The growth variables are the dependent variables for the combination discussed above and the result is in table 4.5 below. I check each regression to ensure that it passes necessary test for this type of analysis, such as identification and instrument validation. The models that I test are: -

$$Y_{it} = \alpha + \beta_1 F_{it} + \beta_2 G_{it} + \beta_3 T_{it} + \beta_4 I_{it} + \varepsilon_{it}$$

$$F_{it} = \alpha + \beta_5 Y_{it} + \beta_6 G_{it} + \beta_7 T_{it} + \beta_8 I_{it} + \varepsilon_{it}$$

where: Y_{it} represents the proxy for growth (Gyp, Gk and Eff introduced separately) of the i-thcountry at time t; F_{it} represents the proxy for financial development (Lly, Private and Privy introduced separately) of the i-thcountry at time t; G_{it} represents Government Expenditure of the i-thcountry at time t; T_{it} represents Trade of the i-thcountry at time t

I_{it} represents Inflation of the i-thcountry at time t

Table 4.5- GMM2STEP REGRESSION RESULT FOR AFRICAN COUNTRIES (GROWTH) 1985 – 2005

Variables	Gyp	Gyp	Gyp	Gk	Gk	Gk	Eff	Eff	Eff
1st stage Variables	Lly	Private	Privy	Lly	Private	Privy	Lly	Private	Privy
Constant	0.000	0.103	0.000	0.307	0.647	0.982	0.000	0.110	.0000
Govt	0.008	0.082	0.001	0.001	0.426	0.002	0.000	0.084	0.004
Trade	0.000	0.083	0.007	0.020	0.019	0.011	0.000	0.051	0.005
Inf	0.324	0.958	0.002	0.012	0.208	0.000	0.001	0.955	0.318
Schenr	0.000			0.000		0.000			
Agedep	0.000								
Exrt			0.000	0.000		0.000	0.000		
$Private_{t-1}$		0.000			0.000			0.000	
Depint		0.070						0.069	
$Govt_{t-1}$					0.030				
$llyo_{t-1}$		0.061						0.066	
$Privy_{t-1}$			0.000						0.000
lly_{t-1}			0.000				0.000		0.000
Shea Partial R^2	0.588	0.239	0.661	0.414	0.243	0.381	0.244	0.236	0.684
Partial R^2	0.588	0.239	0.661	0.414	0.243	0.381	0.244	0.236	0.684
2 Step GMM									
Cons	1.124** (0.004)	3.175** (0.000)	1.861** (0.000)	0.970 (0.201)	3.480** (0.000)	1.295 (0.063)	2.024** (0.000)	2.258** (0.000)	1.649** (0.000)
Lly	2.989** (0.000)			4.567** (0.000)			0.307 (0.331)		
Private		0.364** (0.000)			0.323* (0.043)			0.352** (0.000)	
Privy			2.648** (0.000)			5.281** (0.000)			1.153** (0.000)
Govt	-0.064 (0.690)	0.538** (0.000)	0.039 (0.653)	-0.226 (0.431)	0.412* (0.020)	-0.202 (0.461)	0.267** (0.005)	0.477** (0.000)	0.176* (0.022)
Trade	0.953** (0.000)	1.382** (0.000)	1.026** (0.000)	0.765** (0.000)	1.315** (0.000)	0.806** (0.000)	0.876** (0.000)	1.056** (0.000)	0.798** (0.000)
Inf	-0.115** (0.001)	-0.113** (0.000)	-0.120** (0.000)	-0.108* (0.052)	-0.096* (0.050)	-0.035 (0.534)	-0.132** (0.000)	-0.100** (0.000)	-0.112** (0.000)
Centred R^2	0.448	0.323	0.547	0.305	0.140	0.366	0.374	0.261	0.396
Reg P. Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of Observation	534	445	496	484	495	500	483	432	503
Under ID	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Weak ID	169.47	46.04	317.82	76.78	78.60	85.11	77.14	43.85	539.73
Over ID	0.648	0.113	0.663	0.411	0.627	0.178	0.735	0.207	0.509

*KEY: - GYP is Real per capita GDP; GK is Real per capita Fixed Capital Formation; EFF is defined as GYP – (0.3)GK; LLY is Liquid liabilities to GDP; PRIVATE is Private Sector Credit to Domestic Credit and PRIVY is Private Sector Credit to GDP; GOVT is the ratio of government spending to GDP and TRADE is the ratio of trade (exports plus imports) to GDP; INF is the Inflation rate. Note: Figures in parenthesis ( ) are the p-values for the variables while ** and * depict 1% and 5% level of significance for the coefficients respectively*

The result above shows that all the proxies for financial development variables are highly significant at 1% with the various proxies for growth. This is similar to the findings of King and Levine where the growth proxies were significant at 5% rather than 1% observed in this study. However, the coefficient for both lly and privy are very large while that of private is very tiny. This asserts the quantity of credit allocated to the private sector out of the total bank credit is low and needs to improve to have a similar relationship with the growth variables as currently maintained by the other proxies for financial development. The coefficients observed in this study are significantly larger than what the main study of reference for this work obtained.

Similarly, the regression intercept is very significant for the regressions except in the case of gk and private; and gk and privy. Nonetheless, it is a bit of improvement over the findings of King and Levine where seven out of the eight regressions that includes privy were not significant. Furthermore, the explanatory variables comprising of government spending, trade (exports minus imports as a ratio of GDP) and inflation gave different variations of significance ranging between 1% and 5%. The coefficient for inflation is settled with a negative sign, but that of trade and government expenditure is not settled and this is attributable to the resource curse argument. In Africa, it is very common to get projects for which funds have been disbursed, only to be executed on paper. This explains the huge amount expended by government, but eventually misses out in the growth process.

In essence, no regression had less than two of the three variables significant while in the King and Levine (1993a) result, none of these variables is significant against the growth variables included in their study.

In order to establish causation, which is important for this study, we repeat the same regression discussed with the various proxies for financial development now used as the dependent variable. The result is in table 4.6 below.

Table 4.6 -GMM2STEP REGRESSION RESULT FOR AFRICAN COUNTRIES (FINANCE) 1985 - 2005

Variables	Lly	Lly	Lly	Private	Private	Private	Privy	Privy	Privy
1st stage Variables	Gyp	Gk	Eff	Gyp	Gk	Eff	Gyp	Gk	Eff
Constant	0.243	0.505	0.808	0.055	0.021	0.006	0.243	0.505	0.808
Govt	0.001	0.309	0.062	0.008	0.037	0.305	0.001	0.309	0.062
Trade	0.110	0.226	0.628	0.028	0.541	0.716	0.110	0.226	0.628
Inf	0.991	0.107	0.098	0.762	0.543	0.591	0.991	0.107	0.098
$Govt_{t-1}$	0.018	0.053	0.013				0.018	0.053	0.013
Gyp_{t-1}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Savgdp				0.023	0.000	0.018			
Exrt				0.084	0.000	0.000			
Schenr					0.003	0.005			
Shea Partial R^2	0.967	0.336	0.673	0.967	0.415	0.736	0.967	0.336	0.673
Partial R^2	0.967	0.336	0.673	0.967	0.415	0.736	0.967	0.336	0.673
2 step GMM									
Cons	0.255** (0.000)	0.280** (0.000)	0.278** (0.000)	-0.701** (0.005)	-0.691** (0.003)	-0.696** (0.005)	0.184** (0.000)	0.186** (0.000)	0.185** (0.000)
Gyp	0.125** (0.000)			0.239** (0.000)			0.103** (0.000)		
Gk		0.115** (0.000)			0.205** (0.000)			0.097** (0.000)	
Eff1			0.180** (0.000)			0.335** (0.000)			0.152** (0.000)
Govt	0.098** (0.000)	0.123** (0.000)	0.098** (0.000)	-0.443** (0.000)	-0.436** (0.000)	-0.460** (0.000)	0.095** (0.000)	0.110** (0.000)	0.089** (0.000)
Trade	-0.043 (0.077)	-0.017 (0.455)	-0.042 (0.153)	-0.611## (.000)	-0.590## (0.000)	-0.631## (0.000)	-0.032 (0.058)	-0.017 (0.347)	-0.038 (0.070)
Inf	0.020## (0.002)	0.011 (0.077)	0.022## 0(.006)	-0.025 (0.352)	-0.040 (0.223)	-0.019 (0.533)	0.001 (0.732)	-0.004 (0.387)	0.004 (0.427)
Centred R^2	0.261	0.320	0.008	0.094	0.032	0.081	0.355	0.237	0.125
Reg P Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of Observation	516	503	503	490	472	472	516	503	503
Under ID	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Weak ID	7491.23	125.92	511.85	4833.79	82.28	323.88	7491.23	125.92	511.85
Over ID	0.946	0.406	0.240	0.996	0.159	0.386	0.268	0.470	0.126

KEY: - GYP is Real per capita GDP; GK is Real per capita Fixed Capital Formation; EFF is defined as GYP – (0.3)GK; LLY is Liquid liabilities to GDP; PRIVATE is Private Sector Credit to Domestic Credit and PRIVY is Private Sector Credit to GDP; GOVT is the ratio of government spending to GDP and TRADE is the ratio of trade (exports plus imports) to GDP; INF is the Inflation rate.

***Note**: Figures in parenthesis ( ) are the p-values of the variables. The symbols of ** and * depicts 1% and 5% level of significance for the coefficients and with the expected sign while ## and # also denotes significance at 1% and 5% level of significance but the sign of the coefficient does not tally with the literature. The symbol of * in the diagnostic section denotes significance at 5% or 10% level.*

From the above result, all the growth proxies have high level of significance (1%) with the financial development proxies. This aspect of the study does not form part of the King and Levine (1993a) study hence difficult to make any comparison. Similarly, the

intercept for all the regression are significant at 1%. Govt, which is one of the explanatory variables, is significant for all the regression at 1%, but the coefficient is negative while that for lly and private as dependent variable is positive. Likewise, inflation is only significant at 1% and 10% respectively when lly is the dependent variable. For the other regressions, it is insignificant.

The coefficient for trade is negative in all the regression; highly significant at 1% when private is the dependent variable, weakly significant at 10% when privy is the dependent variable (except when GK is the growth proxy) and not significant when lly is the dependent variable (except when Gyp is the growth proxy). The reason for this follows the previous explanation and suggests that private captures better the relationship between financial development and growth than the other two proxies for finance.

Based on the observation in this study about the effect of the growth variables on the financial development variables as presented in tables 4.5 and 4.6 above, the relationship between finance and growth for countries within the continent of Africa is bi-directional causation. This implies that both growth and finance exerts influence on each other. This finding is different from the finding of King and Levine as they observe that finance is important for growth, but supports the study by Demetriades and Hussein (1996) where they find bi-directional causation for six out of the sixteen countries covered in the study. The result also supports the study by Odedokun (1998) who finds varying degree of effects of finance on growth for both low and high income groups in the developing countries used for the study. Even, the study by Ghirmay (2004) reported that there was no clear evidence in the direction of causality, but however stated that there appears to be some evidence of bi-directional causality in the research. He uses the endogenous growth models and the result of some empirical studies notably Luintel and Khan (1999) to support his argument.

As earlier mentioned, the Ordinary Least Square (OLS) method of estimation is to check the robustness of the result obtained using the two-stage IV/GMM method.

The fixed effect approach is used to assess the relationship and the equations that I test are: -

$$Y_{it} = \alpha + \beta_1 F_{it} + \beta_2 G_{it} + \beta_3 T_{it} + \beta_4 I_{it} + \varepsilon_{it}$$

$$F_{it} = \alpha + \beta_5 Y_{it} + \beta_6 G_{it} + \beta_7 T_{it} + \beta_8 I_{it} + \varepsilon_{it}$$

where: Y_{it} represents the proxy for growth (Gyp, Gk and Eff introduced separately) of the i-thcountry at time t; F_{it} represents the proxy for financial development (Lly, Private and Privy introduced separately) of the i-thcountry at time t; G_{it} represents Government Expenditure of the i-thcountry at time t; T_{it} represents Trade of the i-thcountry at time t I_{it} represents Inflation of the i-thcountry at time t

The results for the above equations are presented in tables 4.7 and 4.8 below.

Table 4.7 - PANEL ESTIMATION REGRESSION RESULT FOR AFRICAN COUNTRIES (GROWTH) 1985 – 2005

Variables	**GYP**	**GYP**	**GYP**	**GK**	**GK**	**GK**	**EFF**	**EFF**	**EFF**
Constant	1.329** (0.000)	1.437** (0.000)	1.347** (0.000)	0.170 (0.082)	1.658** (0.000)	1.689** (0.000)	-0.140** (0.001)	-0.054 (0.259)	-0.034 (0.472)
LLY	0.357** (0.006)			0.023* (0.020)			0.015* (0.032)		
PRIVATE		0.086** (0.000)			0.062** (0.010)			0.025** (0.001)	
PRIVY			0.385** (0.004)			0.358 (0.086)			0.342** (0.004)
GOVT	-0.223** (0.000)	-0.195** (0.000)	-0.235** (0.000)	0.061 (0.189)	-0.402** (0.000)	-0.390** (0.000)	-0.084** (0.000)	-0.043 (0.065)	-0.033 (0.161)
TRADE	0.215** (0.000)	0.201** (0.001)	0.237** (0.643)	0.066 (0.250)	0.132 (0.139)	0.198* (0.030)	0.049* (0.047)	0.043 (0.141)	0.046 (0.104)
INF	-0.011 (0.364)	-0.004 (0.746)	-0.005 (0.012)	-0.000 (0.379)	-0.051** (0.005)	-0.063** (0.001)	-0.000** (0.000)	-0.001** (0.000)	-0.000** (0.000)
R^2	0.387	0.226	0.396	0.026	0.126	0.151	0.081	0.079	0.068
Reg P Value	0.000	0.000	0.000	0.054	0.000	0.000	0.000	0.000	0.000
No of Obs	539	533	539	569	503	509	598	511	517

*KEY: - GYP is real per capita GDP. GK is real per capita Fixed Capital Formation. EFF is defined as GYP – (0.3)*GK. LLY is Liquid liabilities to GDP; PRIVATE is Private Sector Credit to Domestic Credit and PRIVY is Private Sector Credit to GDP; GOVT is the ratio of government spending to GDP and TRADE is the ratio of trade (exports plus imports) to GDP; INF is the Inflation rate. Note: Figures in parenthesis ( ) are the p-values for the variables while ** and * depicts 1% and 5% level of significance for the coefficients respectively*

Table 4.8 - PANEL ESTIMATION REGRESSION RESULT FOR AFRICAN COUNTRIES (FINANCE) 1985 – 2005

Variables	**LLY**	**LLY**	**LLY**	**PRIVATE**	**PRIVATE**	**PRIVATE**	**PRIVY**	**PRIVY**	**PRIVY**
Constant	0.012 (0.625)	1.461** (0.004)	-1.170** (0.000)	-0.760** (0.010)	-1.005** (0.004)	-0.876** (0.002)	0.211** (0.000)	0.261** (0.000)	0.236** (0.000)
GYP	0.053** (0.006)			0.494** (0.00)			0.050** (0.001)		
GK		0.518* (0.025)			0.396** (0.000)			0.017 (0.086)	
EFF			0.590** (0.000)			0.700** (0.000)			0.063** (0.002)
GOVT	0.003 (0.753)	0.553* (0.022)	-0.235 (0.079)	-0.253* (0.050)	-0.345* (0.028)	-0.366** (0.005)	0.053** (0.001)	0.052** (0.002)	0.053** (0.001)
TRADE	-0.010 (0.442)	-0.160 (0.593)	-0.152 (0.346)	-0.416## (0.010)	-0.396# (0.031)	-0.421## (0.007)	-0.084## (0.000)	-0.075## (0.000)	-0.085## (0.000)
INF	-0.002 (0.407)	-0.001 (0.542)	-0.002* (0.001)	-0.002 (0.199)	-0.011 (0.764)	-0.002 (0.068)	-0.011** (0.006)	-0.011** (0.008)	-0.012** (0.003)
R^2	0.021	0.030	0.046	0.062	0.073	0.073	0.081	0.081	0.086
Reg P Value	0.064	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No of Obs	539	533	539	569	503	509	598	511	517

*KEY: - GYP is real per capita GDP. GK is real per capita Fixed Capital Formation. EFF is defined as GYP – (0.3)*GK. LLY is Liquid liabilities to GDP; PRIVATE is Private Sector Credit to Domestic Credit and PRIVY is Private Sector Credit to GDP; GOVT is the ratio of government spending to GDP and TRADE is the ratio of trade (exports plus imports) to GDP; INF is the Inflation rate. Note: Figures in parenthesis ( ) are the p-values of the variables. The symbols of ** and * depicts 1% and 5% level of significance for the coefficients and with the expected sign while ## and # also denotes significance at 1% and 5% level of significance but the sign of the coefficient does not tally with the literature. The symbol of * in the diagnostic section denotes significance at 5% or 10% level.*

The result presented in tables 4.7 and 4.8 above shows that the earlier submission of a bi-directional causation between financial development and economic growth in Africa is a strong postulation that may be difficult to throw away. From table 4.7, all the financial development variables are significant against the proxies for growth and gives similar results with the IV/GMM method of estimation. Specifically, when GYP is the dependent variable, all the financial proxies are significant at 1% and with large coefficient except private, which is tiny. When GK is the dependent variable, the level of significance of the financial development proxies hovers between 1% and 10%.

Models with EFF appear better than that with GK as two of the financial proxies significant at 1% while that of lly is significant at 5%. Government expenditure is relatively stable with a negative sign in these regressions except with the combination of GK and lly that is positive. This is attributable to the natural resource curse argument. Trade is positive and conforms to the literature. The same thing applies to inflation, which has negative and tiny coefficient in all the regressions. In essence, the result

obtained with this methodology is similar to what I obtain from the IV/GMM estimation approach. From the result in table 4.7, all the variables have the expected sign as discussed in chapter two above, but gyp seems to be the best growth proxy because all the explanatory variables are significant except inflation and they all have the expected sign (government expenditure could have a negative coefficient because of the natural resource curse argument).

Table 4.8 presents the result with the financial development proxies as the dependent variable. The growth proxies are significant at 1% and positive in all the regressions except with the pair of lly & GK and privy & GK which are significant at 5% and 10% respectively. Similar with other regressions reported in this study, the coefficient for inflation is negative and tiny. However, the coefficient for trade is negative and highly significant in most of the regressions. This is similar to the result obtained in other sections of this study hence supports the explanations proffered above.

Government expenditure exhibits similar pattern as it gives an unstable result as obtained in the previous results. In most of the regression, the coefficient is significant. Private seems to be the best financial development proxy because all the growth proxies are significant at 1% whereas gk is significant at 5% for lly (as dependent variable) and not significant for privy (as dependent variable). From the foregoing, I observe that the regression results obtained with two different analytical approaches are not essentially different from each other. The result can be classified as robust. It is therefore easy for us to postulate that the relationship between financial development and economic growth is that of bi-directional causation.

From the result of the first hypothesis, I observe that the coefficient for trade is negative in all the regressions. This at best can be described that trade as an explanatory variable in this study has an inverse relationship with the various proxies for financial development. The ratio of government expenditure to GDP exhibits a statistically significant relationship with the financial variables, but the direction of the relationship is not stable as some regressions had positive coefficients while others have a negative sign. Inflation shows a clearer picture with negative coefficient.

In view of this, the thesis supports the above findings with the research done by Crowley (2008) in his study of credit growth in the Middle East, North Africa and Central Asia region. The paper used panel technique to estimate the relationship. This study uses the random effects analytical method for the reasons earlier stated in this paper. The model that we test in this study is -

$$Real\ Private\ Sector\ Credit\ Growth_t = f(\beta_0 + \beta_1 \Delta Real\ Domestic\ Product\ Growth_{t-1} + \beta_2 \Delta\ Real\ Private\ Sector\ Credit\ Growth_{t-1} + \beta_3 \Delta\ Real\ Trade\ Growth_{t-1} + \beta_4 \Delta\ Real\ Total\ Capital\ Account\ Growth_{t-1}$$

where: - β_0 denotes Constant; Real Trade Growth is used to proxy total exports and total imports while Real Total Capital Flow is used to proxy foreign capital flow.

This model is to establish the factors that drive credit growth in the continent. Data for the study is from the World Bank (WDI) database. The study uses annual data covering a period of thirty-seven years between 1970 and 2005. All variables are in their real values.

The model developed by Crowley (2008) which has financial development as the dependent variable fits properly for the purpose of this research. The aim is to establish the factors that drive credit growth within the continent. The study uses normal random effects and random effects GLS regression with AR(1) disturbances methods; both of which produces similar results as presented in Table 4.9 below. The regressions with normal random effects are 1a, 2a--5a; while those with the GLS were named 1b, 2b--5b respectively. The hausman test supports the random approach for the study. Each of the five regressions represents different models through the inclusion of additional variables as explained above.

Table 4.9 - PANEL REGRESSION OUTPUT OF CREDIT GROWTH (RPSCRGDP), 1970-2005

Model No	1a	1b	2a	2b	3a	3b	4a	4b
Intercept	0.016*	0.017*	0.029**	0.033**	0.030**	0.033**	0.026**	0.031**
	(0.047)	(0.039)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.004)
RGDPG	0.936**	0.939**	0.874**	0.881**	0.956**	0.957**	0.673**	0.686**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$RPSCRGDP_{t-1}$	-0.029	-0.033	-0.057*	-0.075**	-0.055*	-0.073**	-0.057*	-0.074**
	(0.158)	(0.118)	(0.020)	(0.009)	(0.025)	(0.010)	(0.020)	(0.010)
REXPG	-0.068#	-0.069#			-0.071#	-0.067#		
	(0.027)	(0.025)			(0.049)	(0.050)		
$RCAPACG_{t-2}$			0.008*	0.007	0.008*	0.008*	0.009*	0.009*
			(0.053)	(0.063)	(0.048)	(0.050)	(0.026)	(0.028)
RIMPG							0.173**	0.167**
							(0.000)	(0.000)
R2	0.308	0.308	0.320	0.319	0.323	0.322	0.338	0.337

*Note: Figures in parenthesis ( ) are the p-values of the variables. The symbols of ** and * depicts 1% and 5% level of significance for the coefficients and with the expected sign while ## and # also denotes significance at 1% and 5% level of significance but the sign of the coefficient does not tally with the literature. The symbol of * in the diagnostic section denotes significance at 5% or 10% level. Regressions numbers with a and b represents approaches using random effect and panel with AR(1) disturbances respectively.*

KEY: - RPSCRG is Log of Real Private Sector Credit Growth; RGDPG is Log of Real GDP Growth; RIMPG is Log of Real Import Growth; REXPG is Log of Real Total Export Growth; RCAPACG is Log of Real Total Foreign Inflow Growth; RPSCRGDP is Log of Real Private Sector Credit to GDP

4.6: INTERPRETATION OF RESULTS

From table 4.9, the intercept is significant for all the regressions. This is contrary to the findings of Crowley (2008) who had all the intercept not significant for his regressions. The growth rate of GDP is significant at 1% and consistent with the findings of Crowley too. An observation in the result is that Private Sector Credit is significant only in regressions 2, 3 and 4. i.e. when I include real capital inflow as one of the variables. The coefficient for lagged private sector credit is not large and negative. The trade variable included, (exports) has a negative coefficient. A continent that I earlier describe as possessing natural endowments which are exported to other parts of the world has a negative coefficient for such an important channel of growth. The coefficient is also not large, but significant at 5% all through for regression 1 and 3. This observation is similar in all the regressions. From the IV GMM and OLS result presented earlier when proxies for financial development is used as the dependent

variable, trade which in this case is explained as the addition of exports and imports and expressed as a percentage of GDP is equally negative.

The inclusion of real capital inflow to the regression improves the level of significance of the variables. The level of significance for the intercept changes from 5% in model 1 to 1% in model 2, while real private sector credit is also significant at 5% and 1% for the random effects and random effects with auto-regressive disturbances (AR) approach respectively. The inclusion of real capital inflow to model 3 had similar effect like model 2, thus all variables included in the regression are significant at varying levels. The R^2 also shows slight improvement although the coefficient for real capital inflow is very tiny, but positive and proves to be important in driving financial development within the continent.

Import growth included into model 4 shows positive result. The coefficient is positive and large. It is also significant at 1%. We therefore postulate that the trading activities of companies within the continent mostly those engaged in import activities has a positive and significant contribution to the development of financial development. The inclusion of both real capital inflow and real imports gave the best R^2 of about 34% effect on financial development obtained throughout the regression results. Based on this result, the combination of real capital inflow and real imports are variables that are very significant in driving financial development within African continent. The widely supported real export exhibits a negative relationship with the proxy for financial development.

Import growth is included to equation 1 and the result presented in table 4.10 below shows a positive result as expected and predicted in table 2.3 above. This suggests that imports exerts positive influence on financial development in contrast to the result with exports growth, which I attribute to the banking system intermediating for importation activities and the proceeds repatriated to the economy.

Table 4.10 - PANEL REGRESSION OUTPUT OF IMPORTS GROWTH WITH CREDIT GROWTH (RPSCRGDP) AS DEPENDENT VARIABLE (1970-2005)

Model No	5a	5b
Intercept	0.014	0.015
	(0.082)	(0.071)
RGDPG	0.642**	0.648**
	(0.000)	(0.000)
$RPSCRGDP_{t-1}$	-0.030	-0.034
	(0.130)	(0.105)
RIMPG	0.176**	0.172**
	(0.000)	(0.000)
R2	0.324	0.324

*Note: Figures in parenthesis ( ) are the p-values for the variable while ** and * depict 1% and 5% level of significance for the coefficients respectively. Regressions numbers with a and b represents approaches using random effect and panel with AR(1) disturbances respectively.*
KEY: - RPSCRG is Log of Real Private Sector Credit Growth; RGDPG is Log of Real GDP Growth; RIMPG is Log of Real Import Growth; REXPG is Log of Real Total Export Growth; RCAPACG is Log of Real Total Foreign Inflow Growth; RPSCRGDP is Log of Real Private Sector Credit to GDP

An earlier statement in this paper is the significance of financial intermediation as postulated by Levine et al (1999). What I can infer from the result of the regressions discussed above is that the financial institutions within the continent are not positioned to intermediate for the economic activities within their immediate environment. A large amount of these are intermediated for, from outside the respective economies hence the negative contribution of exports to the growth of the economies as found in research question one above and the same impact on the financial development within the continent too.

The recent literature on the natural resource is an important factor for the observation in respect of trade. The level of corruption has to be curtailed and proper accountability put in place for government activities. There should be value added to export product to improve the quality and amount obtained. The situation should not be encouraged and calls for immediate reversal of the scenario so that the economy can be in a good position to benefit from the gains of trade that emanates from their environment. By ensuring this, it will improve the status of the financial institutions to be relevant for the advancement of the economy.

4.7 CONCLUSION

In this chapter, I examine the relationship between the financial institutions and growth. The results suggest that the contribution of the financial sector through intermediation is important to growth. However, the contribution of the ratio of private sector credit to total domestic credit is very small when compared with the coefficient of the other two proxies for financial development namely liquid liabilities and ratio of private sector credit to GDP. This possibly implies that a good percentage of the deposit money banks lending is not really to the private sector but rather to other areas of the economy. The ratio of Liquid liabilities is significant and exhibits positive relationship with two of the proxies for growth in the regression result.

The study has also finds that both the proxies for growth and financial development exert positive effect on each other. This situation therefore suggests bi-directional causation.

The financial institutions are not very relevant in intermediating for trade mostly exports that happens within their environment. Real exports exhibit negative relationship with financial development while variables such as real capital inflow and real imports are significant hence relevant for driving financial development within the continent.

The basic inference from this is that banks have been financing local businesses that are engaged in importation of goods and services while the major aspect of trade (exports) is outside their coverage and the natural resource curse argument. This may be because most of the companies handling the domestic export trade are foreign oriented hence source for credit within their respective area of strength. Likewise, it may be that the domestic banks are not strong enough for the financial requirements of these companies. Because of this, the companies look beyond the shores of their operational base to seek for financial assistance. Likewise, the proceeds of exports may be diverted to foreign account or private sources as those involved find it difficult to explain the source of

such funds. Whatever may be the reason responsible for this situation, it is not beneficial to the continent and needs to change so that the continent can be on the path of sustained growth.

CHAPTER FIVE

BANK EFFICIENCY IN AFRICA

5.0 Introduction

The concept of efficiency is gaining wider interest in the economic literature. This I define as the ratio of output to the input of any system. It also describes the measure of diligence exhibited in the course of performing a specified task. This in essence implies the ability to reduce or avoid waste without reducing the expected output. According to Sealey and Lindley (1977), the lack of success of previous studies in developing a positive theory of the financial firm can be attributed to the inadequate or incomplete use the fundamentals of firm theory. They noted that previous researchers failed firstly to "appropriately classify outputs and inputs of the financial firm by failing to consider the criteria on which the financial firm makes decision and secondly to analyse the technical aspects of the production and cost for the financial firm". Knowledge of this assists the management to make decisions that are consistent with economic principles.

The depth of financial intermediation is low for Africa and seems to follow the level of income for the respective countries. This observation is similar to the postulations of Allen and Ndikumana (1998) that financial development enhances efficiency in the allocation of resources and stimulates the growth process. He further explained that, in economies with unsophisticated financial systems, there are fewer investment opportunities which implies a higher probability that they waste resources on unproductive uses. The situation for the African countries typifies what Allen and Ndikumana (1998) describes above. This is because evidence abounds for areas where investment opportunities exist, but the deposit mobilising institutions does not fund these projects. This scenario, Hao (2006) describes as earlier stated in his study of the relationship between financial intermediation and economic growth in China. According to findings in the study, financial intermediation development only contributes to growth through two channels for the economy. The first is the substitution of loans for state budget and the mobilization of household savings. Loan expansion for the Chinese economy does not contribute to growth because the distribution by the financial intermediaries is inefficient.

The previous empirical studies in this work on Nigeria and Africa as a whole suggests that the finance - growth relationship is a reverse or bi-directional causation. The studies also show the importance of private sector credit in the process of financial intermediation. Similarly, I observe that while the continent has natural resources, the activity exhibits negative relationship to financial development. Many reasons could be adduced to this observation, one of which is that the financial institutions are not really intermediating for the financial requirements of the exporting activities within their environment.

The study by World Bank (2006) on "Making Finance work for Africa" buttresses this assertion when they state that there is still a lot to do to make the financial institutions relevant for the growth of their respective economies. According to the study, finance within the continent is shallow and fraught with limited access by the firms and households. The economic environment is difficult with little progress made over time. These observations from the two previous empirical studies in this thesis and that of the World Bank suggest that the financial institutions do not integrate with the real sectors of the economy. A possible inference is that the F.I are not efficient in the discharge of their services to ensure an effective impact on the economy. In this study, I pay attention to investigate the efficiency of the financial institutions depicted by the deposit money banks.

In the analysis, I present some proxies of financial development such as ratio of liquid liabilities to GDP; the ratio of Private Sector Credit by the Deposit Money Banks to GDP and the ratio of money outside the coffers of the banking sector to Base Money in three different charts represented as figures 5.1; 5.2 and 5.3 respectively below.

Figure 5.1: Liquid Liabilities as a ratio of GDP FOR African Countries

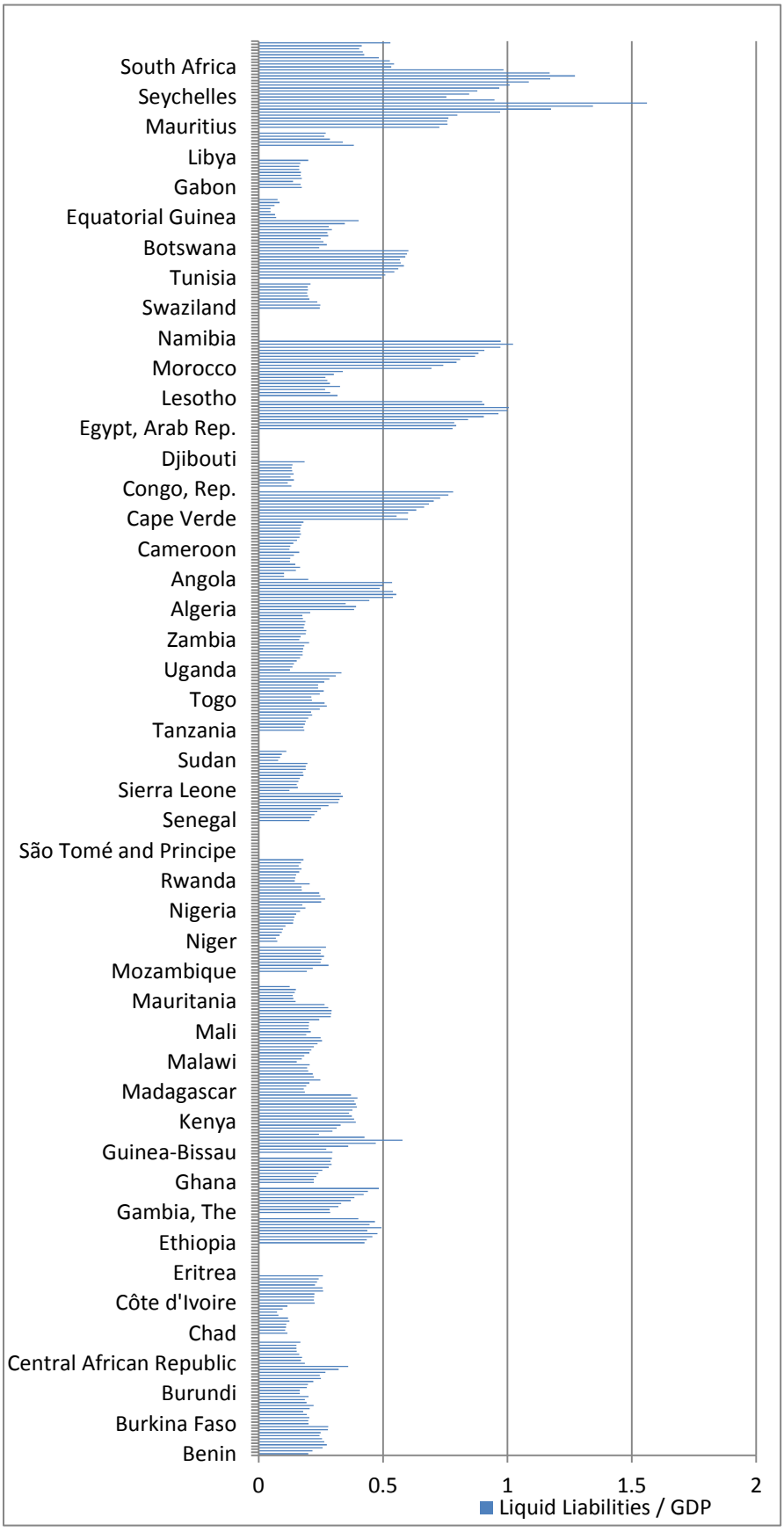


Figure 5.2: Private Sector Credit by Deposit Money Banks as a ratio of GDP for African Countries

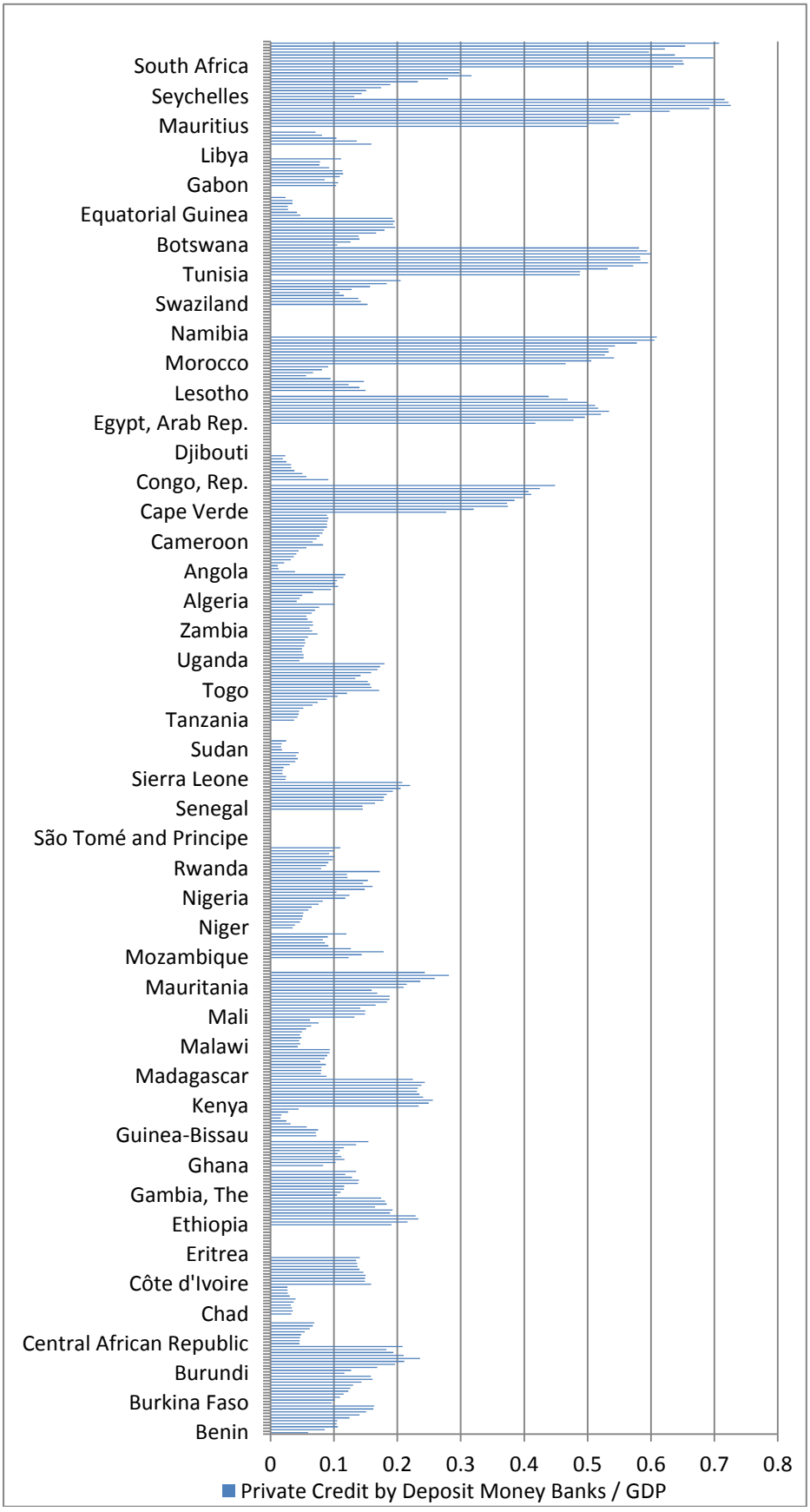
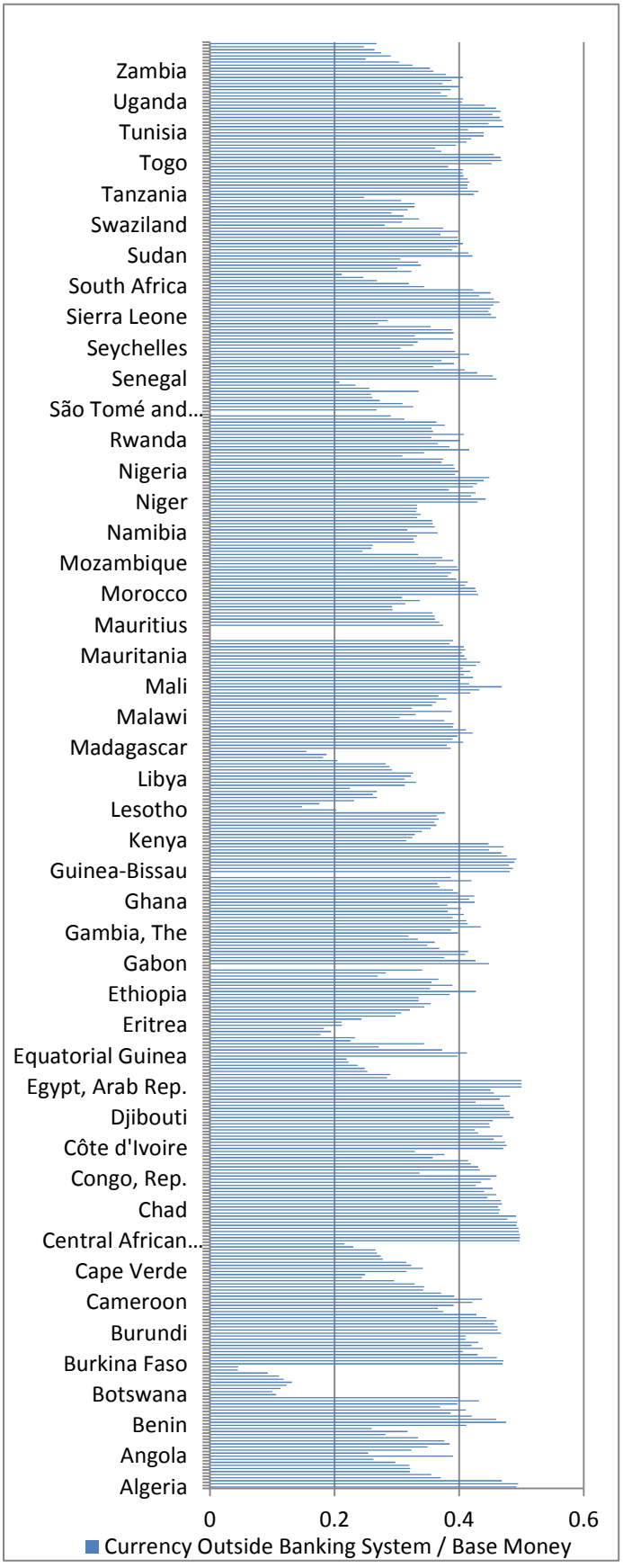


Figure 5.3: Currency Outside the Banking System as a ratio of Base Money for African Countries



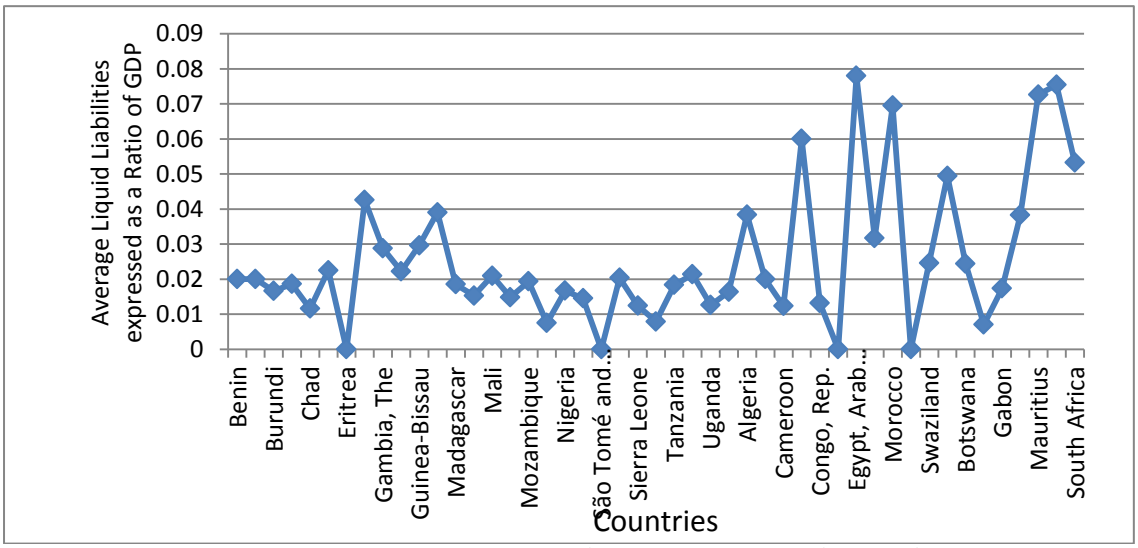
The charts show that Liquid Liabilities, which is expressed as a ratio of GDP for most of these countries, is below 0.5. There are some countries, which are outliers in the chart such as Seychelles, Mauritius, Morocco, Egypt, Congo Republic and Cape Verde. For these countries, the ratio is higher than 0.5 and for some as high as 1.5. To some extent, this is relatively high, when compared with other countries within the continent. However, some countries like Djibouti, Sao Tome and Principe and Eritrea have negligible ratio. These countries are all around the zero mark on the chart.

For Private Sector Credit by Deposit Money Banks equally expressed as a ratio of GDP, the situation is much poorer than described above for Liquid Liabilities. Most of the countries were within the range of 0 and 0.2, a much lesser figure than 0.5 for Liquid Liabilities. Similar to the observation with Liquid Liabilities, some countries like South Africa, Mauritius, Morocco, Cape Verde, Egypt and Tunisia were outliers in the chart. In addition, countries like Namibia, Djibouti, Sudan, Sao Tome and Principe and Eritrea were almost within the zero mark on the chart. A further look at the two charts discussed above show that there seems to be some sort of correlation between the Income Classification of the countries and the financial development proxies. This is with some exceptions in countries such as Libya, Gabon, Equatorial Guinea, Djibouti, Namibia e.t.c. that are classified as Middle Upper/Low; yet do not seem to show significant correlation with the ratios for financial development proxies.

The volume of currency outside the banking system is the ratio of Base money in the third chart. In an attempt to analyse this, I exercise reasonable care because the denominator is different from the other two proxies discussed above. The chart shows that for most of the countries, the ratios were within the range of 0.3 and 0.4. Most of the countries appear to cluster within this range, with only some few exceptions above 0.4 and only Botswana is actually below 0.2. This observation suggests that most of the African countries that were included in this study have about 30% - 40% of their base money outside the banking system and this does not seem to correlate with the income classification of the respective countries. From the foregoing analysis, I am of the opinion that the volume of liquid liabilities and Private sector credit in these countries show positive relationship with income classification of the countries. The volume of

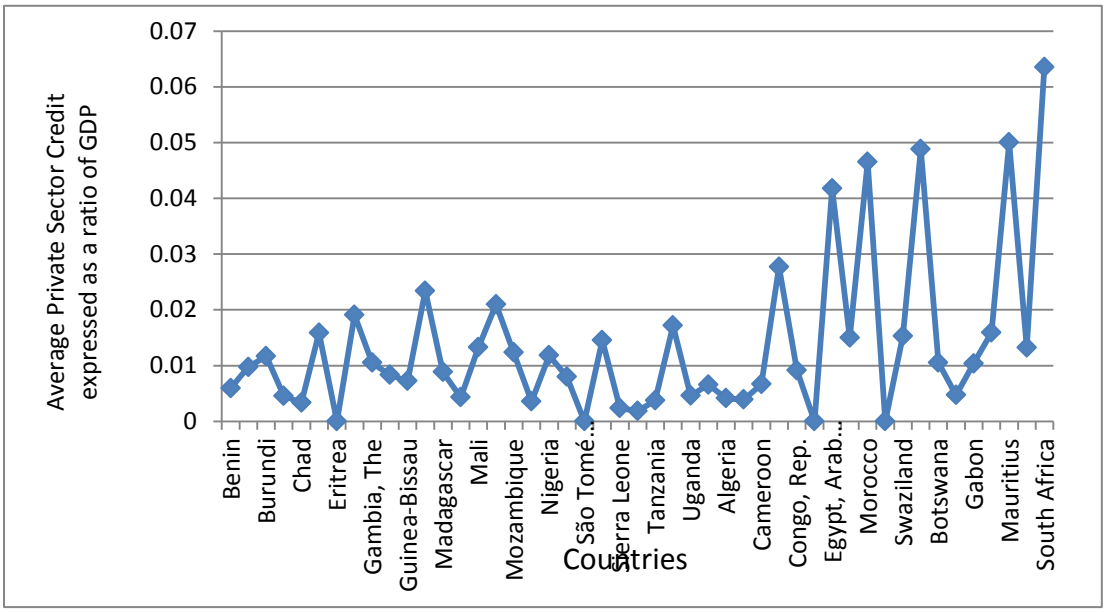
money outside the banking system does not positively relate to income classification of the countries; but appears to be a common feature for these developing countries. To buttress the above assertion, I arrange these countries based on their income classification and presented in two separate scatter plots (figures 5.4 and 5.5) to examine the type of relationship that exists amongst them. The plots were limited to private sector as a percentage of GDP and liquid liabilities as a percentage of GDP that are necessary to show some sort of relationship with countries income classification. As earlier stated, liquid liabilities seems to be more than Private Sector Credit. Whichever way this is viewed, it portends a gap within the system which could possibly be attributable to inefficiency of the system.

Figure 5.4: Ratio of Average Liquid Liabilities to GDP for African Countries between 1998 – 2007



Note: - Countries are arranged according to their income level classification in ascending order from the left to the right

Figure 5.5: Ratio of Average Private Sector Credit to GDP for African Countries between 1998 – 2007



Note: - Countries are arranged according to their income level classification in ascending order from the left to the right

The scatter plots as expected show positive cluster to the right side, which suggests that income classification and financial development are positively related. As earlier mentioned, this observation supports the finding of previous researchers (Levine, 2007; Allen and Ndikumana, 1998). It may be difficult to conclude this statement at this stage, because some countries volume of financial proxies did not respond significantly to their income classification. I make further enquiry about this in the course of this work. Nonetheless, I find that the volume of liquid liabilities is higher than the volume of private sector credit by the banks. As earlier mentioned, this may suggest poor integration by the financial institutions with the real sector of the economy. In view of this, I will examine of the level of efficiency by the banks so as to assess the extent of the inefficiency within the system.

There are numerous studies on bank efficiency, but most of them are on the developed and transition economies. These papers focused on different aspects of the banking industry. Berger and Humphrey (1997) conducted a study based on survey of 130 previous studies that covered 21 countries. They find that the various methodologies do not produce consistent result. The concept of inefficiency is not a phenomenon

associated with the under-developed, but cuts across levels of development. Berger et al.'s (1997) study on 760 branches of a large US commercial bank suggests that "there are twice as many branches that would minimise cost with the X-inefficiencies more than 20% of operating costs". Casu and Molyneux (2003) support this view in their study of the European banking system using Tobit regression model approach. They find that following the EU legislative harmonisation, there has been a small improvement in bank efficiency levels.

A concept discussed in the literature is the inclusion of firm/country specific variables that could account for some of the variations in the inefficiency term. Battese and Coelli (1995) tried this approach in their panel study on 14 paddy farmers from an Indian village. They find that the model for the technical inefficiency effects, which includes a constant term, age, schooling of farmers and year of observation were a significant component in the stochastic frontier production function. Hollo and Nagy (2006) further discussed this view in their study on bank efficiency in the enlarged European Union and considered the impact of controlling for factors that are country specific but originate from the banks operational environment. They find that controls for such factors reduce the size of the actual gap between the old and new member states (and vice versa). They also find the existence of an X-efficiency gap.

Some studies on efficiency have equally focused at examining the concept of ownership of the banks. Hauner (2005) in his study of the large German and Austrian banks observed that state owned banks are more cost efficient (possibly due to availability of cheaper funds) while cooperative banks are as cost-efficient as private banks. The premise of this study is similar to that of Chen (2009) who examines the efficiency of banks in Sub-Saharan African middle-income countries. They find that banks on average could save between 20-30% of their total costs if they operate on the efficient frontier. Similarly, they opined that foreign banks are more efficient than public banks and domestic banks. The study by Ikhide (2009) on commercial banks in Namibia follows the same line of argument as those discussed above. He opines that commercial banks in the country can increase their efficiency by increasing their current scale of operation while the current level of input combination does not make for maximum efficiency.

The efficiency of the banking sector is an important point that aids the actual realisation of the purpose of the financial sector. One of the major reasons for the establishment of banks is to facilitate the concept of intermediation through re-directing funds from the surplus sector to the deficit sector of the economy. This issue transcends the soundness of banks, but involves positioning sounds banks to provide efficiently the much-needed credit for growth. According to Ikhide (2009), the solvency, strength and soundness of the banking system are germane to the performance of the entire economy. Without a sound and efficiently functioning banking system, the economy cannot function. Due to this reasons amongst others, banking supervisors place a lot of emphasis on banks operational efficiency.

When a country opens up to international trade, it grows faster. This presumes that export led growth facilitates industrial and financial development (Stiglitz; 2002) and this fete is being viewed to have accounted for the rapid growth in Asia which has improved the standard of living of the populace. This position sharply contrasts the situation in Africa hence the need to investigate the level of efficiency of the banking sector in discharging their duties.

A study of efficiency usually involves estimating the efficient frontier and determining the extent of deviations from the efficient frontier by each cross-section. In order to do this, two methods are popular for the estimation. These are the Data Enveloping Analysis (non-parametric) and the Stochastic Frontier Analysis (parametric). According to Berger and Humphrey (1997), these methods differ based on the assumptions imposed on the data, but there is no consensus on the preferred method for determining the efficient frontier. In essence, these approaches differ in how much shape is imposed on the frontier along with the distributional assumptions imposed on the random error and inefficiency.

The Data Enveloping Analysis (DEA) is a non-parametric methodology that uses the linear programming approach. Farrell in 1957 proposed this procedure initially, but Charnes et al in 1978 later used it for analysis. This method assumes economic

optimalisation of the efficiency frontier. It is formed as the piecewise linear combination which connects the set of observation in the series being analysed, thus yielding a convex production possibility set. Consequently, they define the DEA efficiency score relative to other Decision-Making Unit, different from the usual absolute standard. The DEA thus not require a full specification of the underlying functional form for the relationship; a requirement that is essential for the parametric methodology. This procedure however assumes that there is no random error in the estimated relationship and suites best a balanced panel.

The Stochastic Frontier Analysis (SFA) is a parametric tool for the measurement of efficiency. Aigner et al (1977), and Meeusen and Van den Broeck (1977) developed it independently. This methodology allows the specification of the functional form for the estimated relationship and provides random error, which is decomposed to allow for estimation of the technical efficiency. The procedure assumes that part of the error component (composed) captures the inefficiencies of the system and that these errors are asymmetrically distributed. The random error component is symmetrically distributed. Due to this reason, the SFA is widely used though no confirmed opinion on which of the two approaches is better. However, this study intends to use the SFA, not because it is a better tool (as that cannot be asserted), but rather because it suits the study being proposed and more suitable for unbalanced panel which characterises the data that I intend to use.

5.1 The Stochastic Frontier Analysis

The SFA is a tool useful in estimating the technical inefficiency for both the production and cost estimation. The process involved are essentially the same, but the underlying assumption differs for the two forms of estimation. In this study, I will use the cost function to estimate the efficiency of the banking sector in Africa.

The SFA as earlier mentioned allows a decomposition of the error term to obtain the level of efficiency and the random error (white noise). Now, let us consider a model in the panel form:

$$Y_{it} = \beta X_{it} + \varepsilon_{it} \qquad (1)$$

Where: -

Y_{it} is the cost (or log) of the i-th firm at time t

X_{it} is a kx1 vector of input and output prices of the i-th firm at time t

β is the vector of unknown parameters

ε_{it} is the error component of the i-th firm at time t which the frontier decomposes further.

When the error term is decomposed, the model with the SFA becomes

$$Y_{it} = \beta X_{it} + (V_{it} + U_{it}) \qquad (2)$$

Where

V_{it} is the symmetric random variable representing errors of approximation and other sources of statistical noise of the i-th firm at time t which is assumed to be iid $[N(0,\sigma_v^2)]$ and U_{it} is the non-negative random variable which is assumed to account for technical inefficiency in production and are often assumed to be iid $[N(0,\sigma_u^2)]$. Using the Battese and Coelli (1995) specification, the random variables could be assumed to be iid with a normal or half normal distribution as truncations at zero of the $[N(m_{it},\sigma_u^2)$ and m_{it} represents $Z_{it}\delta + W_{it}$

Z_{it} is a vector of px1 variables, which are capable of influencing the efficiency of a sector specific firm/country while δ is the unknown coefficient for the estimation. W_{it} represents the truncation of the distribution with zero mean and variance σ^2. Therefore the point of truncation is $Z_{it}\delta$; implying that $W_{it} \geq Z_{it}\delta$

Technical efficiency is used to depict the current level of output over maximum output given the level of input. It is the ratio of observed output to the corresponding stochastic frontier output:

$$TE_{it} = \frac{Y_{it}}{exp(X_{it}\beta + V_{it})} = \frac{exp(X_{it}\beta + V_{it} + U_{it}}{exp(X_{it}\beta + V_{it})} = exp(U_{it}) \leq 1 \qquad (4)$$

Therefore $TE_{it} = exp(U_{it}) = exp(Z_{it}\delta + W_{it})$

There are two forms of estimation with the cost function. The first is the log-linear Cobb-Douglas while the second is the log-linear translog function. The model for both are as stated in equation 4 and 5 below.

$$\textit{Cobb-Douglas: } lnY_{it} = \beta_0 + \sum \beta_n lnX_{nt} + (V_{nt} + U_{nt}) \quad (5)$$

$$\textit{Translog: } lnY_{it} = \beta_1 + \sum \beta_n lnX_{nt} + \frac{1}{2}\sum\sum \beta_{nm}\, lnX_{nt}\, lnX_{mt} + (V_{nt} + U_{nt}) \quad (6)$$

The U_{nt} *is* ≥ 0; thus implying that the cost efficiency is a function of the cost that was efficiently utilised by the firm. Where the cost efficiency estimate is 0.6, this implies that it is possible to reduce 40% of the firm's cost if it operates along the frontier line.

The debate on the efficacy of either of the above two functions seems not fully settled. However, most of the literature supports the use of the translog function, as it is capable of explaining the model better than the Cobb-Douglas function (Duffy and Papageorgiou, 2000). Nonetheless, I estimate the two functions and assess which of these two explains better the variability occasioned by inefficiency.

5.2 METHODOLOGY

In this thesis, I use the SFA methodology to estimate the efficiency frontier. I will be estimating the cost function and assume that the errors exhibit half-normal distribution. This will involve the estimation of both the Cobb-Douglas and the Translog methodologies and a decision made about which of the methods best explains the model.

Following Sealey and Lindley (1977), I use the intermediation approach that assumes bank deposits are inputs in the operational cycle. The model I estimate involves a three output and three input variables. The variables used for the estimation follow the definition of Hollo and Nagy (2006). The input variables are labour, capital and cost of borrowed funds while the output variables are loans, other earning assets and non-interest income. Unlike the approach of Hollo and Nagy, I separate the output variables

and estimate the model with each of the output variables. The model is varied with the inclusion of some variables that are country specific and may likely affect the level of the efficiency as postulated by Battese and Coelli (1995) and Hollo and Nagy (2006).

The Cobb-Douglas and Translog models that I estimate are stated in equations 7 and 8 below:

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + V_{it} + U_{it} \quad (7)$$

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + 0.5\beta_5 X_1^2 + 0.5\beta_6 X_2^2 + \beta_7 X_3^2 + \beta_8 X_4^2 + \beta_9 X_1 X_2 + \beta_{10} X_1 X_3 + \beta_{11} X_1 X_4 + \beta_{12} X_2 X_3 + \beta_{13} X_2 X_4 + \beta_{14} X_3 X_4 + V_{it} + U_{it} \quad (8)$$

Where:

Y_{it} is the logarithm of Total Cost for the firms (banks);

X_1 is the logarithm of output (total loans; other earning assets; other operating income); X_2 is the cost of labour (wages);

X_3 is the firm's capital and

X_4 represents the cost of borrowed funds.

To examine the level of inefficiency, U_{it} is modelled as a half normally distributed random variable that can be influenced by some macro-economic variables. Similar to the input and output variables, these macro-economic variables follow the definition of Hollo and Nagy (2006) and they are inflation (INF), private sector credit as a percentage of GDP (PSCRGDP), liquid liabilities as a percentage of GDP (LLY) and domestic bank assets as a percentage of GDP (DBAGDP). All the macro-economic variables are from Beck et al (2000) database. Thus the technical efficiency equation is:

$$U_{it} = \delta_0 + \delta_1 PSCRGDP_{it} + \delta_2 DBAGDP_{it} + \delta_3 LLY_{it} + \delta_4 INF_{it} + W_{it}$$

Where: -

PSCRGDP is Private Sector Credit by the Deposit Money Banks as a percentage of GDP

DBAGDP is Domestic Bank Assets as a percentage of GDP

LLY is Liquid Liabilities as a percentage of GDP and

INF is Inflation Rate

These variables are not in log form in the regression because they are expressed as a ratio by definition.

5.3 Data – Definition and Summary Result

The bank specific data used for this study is from BankScope. The data covers forty-seven African countries. Data obtained are in respect of banks classified as commercial bank by the database. I change the data to their respective dollar value using the exchange rate obtained from the IFS. Data for the macro-economic variables are from Beck et al database. Similar to Sealey and Lindley, I adopt a multi output model and later introduced the outputs into the model one after the other. This follows the intermediation approach, which assumes that bank deposits are output. This implies that each model contains one output used for the estimation.

The three outputs employed in the analysis are - Loans, Other Earning Assets and Other Operating Income. The variables are as defined by datascope. The input and netput variables are Labour, Physical Capital and Cost of Funds. Labour data is personnel expenses as a ratio of total assets. The Physical Capital is the difference between non-interest expenses and personnel expenses as a ratio of total assets. Lastly, cost of funds is interest expenses as a ratio of total deposit. The dependent variable is total cost, which I obtain from the addition of interest expenses and non-interest expenses (including personnel expenses). All the variables are in log form for the estimation.

In total about three hundred and twenty nine (329) banks are included in the analysis from forty-seven African countries (comprising of medium and low income). Table 5.1 below shows that the variables are widely dispersed from each other. The figure for all the variables average about 6.0 as shown by the minimum and maximum values. I anticipate this because of the difference in the income level of the countries. Nonetheless, the variables exhibit normality with the Jarque-Bera result.

Table 5.1: Summary Statistics for Bank Related Variables in Africa 1998-2007

	Cost of Funds	Labour Expenses	Loans	Other Earning	Other Operating	Physical Capital	Total Cost

				Assets	Income		
Mean	-2.070	-1.923	1.388	1.320	1.586	-1.112	0.852
Median	-1.950	-1.815	1.540	1.410	1.810	-0.550	0.790
Maximum	1.460	0.240	5.130	4.560	5.160	1.940	4.220
Minimum	-5.870	-5.730	-1.270	-2.340	-1.090	-4.950	-2.190
Std. Dev.	1.860	1.922	1.111	1.093	1.198	1.364	0.818
Jarque-Bera	314.383	383.986	100.185	77.383	122.016	264.974	190.986
Observations	3290	3290	3290	3290	3290	3290	3290

5.4 Analysis and Interpretation

As earlier mentioned, I use three outputs and three input/netput variables in this analysis along with four macro-economic variables. As earlier stated, the output variables will be used one after the other for the estimation, thus implying three different estimations for the three outputs. The SFA methodology is applied. Based on the result of equations seven and eight which is in agreement with the previous studies, the Cobb-Douglas approach is not able to define the model as much as the translog approach. I use the translog approach and present the result for the estimation in table 5.2 below. The result contains three different estimations that have the dependent variable different. As mentioned earlier, the three output variables, namely Loans, Other Earnings and Other Operating Income are the dependent variable, applied individually in each of the regressions. Due to the type of modelling involved with the translog function estimation, it therefore means that all the variables for each of the regressions will not essentially be the same.

Table 5.2 - Estimation Output of Cost Efficiency for African Countries
1998 – 2007

Bank Specific Variables	Regression 1- Model with Output as Loans	Regression 2- Model with Output as Other Earnings	Regression 3- Model with Output as Other Operating Income
Constant	-0.11*** (0.01)	-0.15*** (0.01)	-0.11*** (0.01)
Loans	0.44*** (0.02)		
Other Earnings		0.47*** (0.02)	
Other Operating Income			0.41*** (0.02)
Labour	-0.08*** (0.02)	-0.05** (0.02)	-0.10*** (0.02)
Physical Capital	0.24*** (0.03)	0.04 (0.03)	0.05 (0.03)
Cost of Funds	-0.07*** (0.03)	-0.12*** (0.03)	0.15*** (0.02)
Half Square of Loans	0.15*** (0.01)		
Half Square of Other Earnings		0.07*** (0.01)	
Half Square of Other Operating Income			0.11*** (0.01)
Half Square of Labour	-0.04*** (0.01)	-0.04*** (0.01)	-0.05*** (0.01)
Half Square of Physical Capital	-0.03 (0.02)	-0.03 (0.02)	-0.07*** (0.02)
Half Square of Cost of Funds	-0.05*** (0.01)	-0.09*** (0.01)	-0.02*** (0.01)
Loans *Labour	-0.00 (0.01)		
Other Earnings*Labour		-0.02*** (0.01)	
Other Operating Income*Labour			-0.02** (0.01)
Loans *Physical Capital	0.00 (0.01)		
Other Earnings* Physical Capital		0.05*** (0.01)	
Other Operating Income* Physical Capital			0.05*** (0.01)
Loans * Cost of Funds	-0.01 (0.01)		
Other Earnings* Cost of Funds		-0.04*** (0.01)	
Other Operating Income* Cost of Funds			-0.07*** (0.01)
Labour* Physical Capital	0.04*** (0.01)	0.03*** (0.01)	0.04*** (0.01)
Labour* Cost of Funds	-0.02*** (0.01)	-0.02*** (0.01)	-0.03*** (0.01)
Physical Capital * Cost of Funds	0.06*** (0.01)	0.05*** (0.01)	0.07*** (0.01)
EFFICIENCY RESULT			
Economy Specific Variables	Regression 1	Regression 2	Regression 3
Constant	-0.82*** (0.07)	-1.19*** (0.16)	-5.46*** (0.17)
Private Sector Credit as % of GDP	-5.99### (0.57)	-1.98### (0.32)	-3.78### (0.63)
Domestic Bank Assets as a % of GDP	2.43*** (0.28)	6.23*** (0.72)	8.82*** (0.82)
Liquid Liabilities as a % of GDP	-0.27 (0.28)	4.82*** (0.60)	4.28*** (0.28)
Inflation	0.00*** (0.00)	-0.00*** (0.00)	0.01*** (0.00)
$\sigma 2$	0.25*** (0.01)	0.33*** (0.02)	0.60*** (0.02)
γ	0.74*** (0.01)	0.76*** (0.02)	0.92*** (0.00)
Log likelihood	-506.86	-912.22	-254.55
Likelihood ratio test	388.22	209.31	582.04

*Note: Figures in parenthesis ( ) are the Standard error of the variables. The symbols of ***; ** and * depicts 1%; 5% and 10% level of significance for the coefficients and with the expected sign while ###; ## and # depicts 1%; 5% and 10% level of significance but the sign of the coefficient does not tally with the literature.*

The result shows that the likelihood ratio test is high. It suggests a proper specification of the model. This is further buttressed by both $\sigma 2$ (sum of variances) and γ (variance of inefficiency term over sum of variances) which are both jointly highly significant. This means that the model is good. It also implies that both $\sigma 2$ and γ are important in the determination of cost efficiency for the banks in Africa. The gamma (γ) of 0.92 is highest for the model with other operating income as the output variable. This means that these banks are highly efficient with costs in determining their operating income.

Next to that is the model with other earnings as the output variable, which has 0.76 for gamma. This figure is very close to that of 0.74 for the model with loans as the output variable. What this implies is that inefficiency ranges between 24 - 26 percent of cost for the industry. Alternatively, it means that the bank can avoid about 24-26 percent of cost expended if the sector operates along the efficient frontier. This finding is consistent with the view of Chen (2009) who observed about 20-30 percent cost inefficiency for banks in the Sub-Saharan Middle-Income Countries. It is also consistent with the observation of Ikhide (2009) when he opined that banks in Namibia still have economies that they can exploit with increase in the size of the larger banks. He is of the opinion that these banks are operating at the declining portion of their of their average cost curve, they have not reached their optimum size where their operating costs are lowest. In essence, they are not yet operating along the frontier line.

All the macro-economic variables included in the study are important in determining the efficiency of the banking sector. Except for liquid liabilities, which are not significant, when loans is the output variable, others are significant at 1%. This also affirms that the macro-economic variables are important for the efficiency of the sector. It is possible to anticipate the non-significance of liquid liabilities, as it does not enhance the sector when funds are outside the banking system. Though a common feature with the developing countries, it is proving not to aid efficiency hence the situation needs to change from a cash carrying economy that typifies the developing countries to cash-less country that typifies the developed economies.

The sign of the coefficient for private sector credit as a percentage of GDP is negative. This implies that increases in total cost reduce private sector credit expressed as a ratio of GDP. However, I expect this relationship, but it could be a major source of inefficiency, as banks in the developing economies charge higher costs which puts off credible investors from embarking on a good proposal. Another observation is labour which also has a negative coefficient. This runs contrary to expectation as one would expect a positive relationship between total cost and labour cost. In these countries, the cost of labour is very cheap thus; it may suggest a reduction with increases in operational activities. This is a bane to banking services and may make it difficult to attract the right calibre of staff that will deliver the efficient services so much desired in

these economies. All the other signs are as expected (according to table 2.3 above which provided the empirical justification for the use and sign for the variables) in the study.

One of the major arguments in literature is that the level of income of a country plays a role in the level of efficiency of the financial system. In view of this, I estimate the cost function based on the two main income levels within the continent i.e. medium or low. The result of this estimation is in tables 3, 4 and 5 below for each of the output variables. The result in table 3 represents when bank loan is the output variable. This approach is to facilitate comparison amongst the different types of combination included in the analysis. The same procedure applies to the other output variables and their results shown in tables 5.3 and 5.4 below.

Table 5.3: Estimation Output of Cost Efficiency with Loans as Output Variable for African Countries 1998 – 2007

Bank Specific Variables/Country Combination	All Countries	Medium Income	Low Income
Constant	-0.11*** (0.01)	-0.17*** (0.01)	-0.13*** (0.03)
Loans	0.44*** (0.02)	0.28*** (0.03)	0.24*** (0.03)
Labour	-0.08*** (0.02)	-0.05 (0.04)	-0.21*** (0.02)
Physical Capital	0.24*** (0.03)	0.19*** (0.08)	0.23*** (0.03)
Cost of Funds	-0.07*** (0.03)	-0.19*** (0.05)	-0.01 (0.03)
Half Square of Loans	0.15*** (0.01)	0.08*** (0.01)	0.28*** (0.02)
Half Square of Labour	-0.04*** (0.01)	-0.09*** (0.02)	-0.05*** (0.01)
Half Square of Physical Capital	-0.03 (0.02)	-0.14*** (0.03)	0.05*** (0.02)
Half Square of Cost of Funds	-0.05*** (0.01)	-0.05*** (0.02)	-0.05*** (0.01)
Loans *Labour	-0.00 (0.01)	-0.05*** (0.01)	0.02** (0.01)
Loans *Physical Capital	0.00 (0.01)	0.06*** (0.02)	0.01 (0.01)
Loans * Cost of Funds	-0.01 (0.01)	-0.13*** (0.01)	-0.04*** (0.01)
Labour* Physical Capital	0.04*** (0.01)	0.16*** (0.01)	-0.01 (0.01)
Labour* Cost of Funds	-0.02*** (0.01)	-0.08*** (0.01)	-0.01** (0.01)
Physical Capital * Cost of Funds	0.06*** (0.01)	0.00 (0.02)	0.07*** (0.01)
EFFICIENCY RESULT			
Economy Specific Variables	All Countries	Medium Income	Low Income
Constant	-0.82*** (0.07)	-2.31*** (0.29)	0.09** (0.04)
Private Sector Credit as % of GDP	-5.99### (0.57)	-7.86### (0.96)	-1.40### (0.57)
Domestic Bank Assets as a % of GDP	2.43*** (0.28)	6.23*** (0.84)	0.45 (0.32)
Liquid Liabilities as a % of GDP	-0.27 (0.28)	-3.33*** (0.54)	0.08 (0.16)
Inflation	0.00*** (0.00)	0.00*** (0.00)	0.01*** (0.00)
$\sigma 2$	0.25*** (0.01)	0.77*** (0.07)	0.06*** (0.00)
γ	0.74*** (0.01)	0.94*** (0.01)	0.11** (0.05)
Log likelihood	-506.86	-282.07	76.44
Likelihood ratio test	388.22	355.44	126.67

*Note: Figures in parenthesis ( ) are the Standard error of the variables. The symbols of ***; ** and * depicts 1%; 5% and 10% level of significance for the coefficients and with the expected sign while ###; ## and # depicts 1%; 5% and 10% level of significance but the sign of the coefficient does not tally with the literature.*

When bank loan is the output variable, the likelihood ratio test affirms the joint significance of the sum of variance ($\sigma 2$) and gamma (γ). Both $\sigma 2$ and γ are significant for the three estimations. This posits that efficiency is important for these banks. The efficiency level for the medium income countries, which is 0.94, is significantly higher than 0.74 obtained for all the countries grouped together. The efficiency level for the low-income countries is 0.11. This implies that banks in medium income countries are far more efficient than the low-income countries. It also suggests that while inefficiency in the medium income economies is limited to below 10 percent that of low-income countries is as high as possibly 90 percent. Domestic bank assets as a percentage of GDP has a negative coefficient for the low-income countries, which may suggest poor asset base by the financial institutions in these countries.

Table 5.4: Estimation Output of Cost Efficiency with Other Earnings as Output Variable for African Countries 1998 – 2007

Bank Specific Variables/Country Combination	All Countries	Medium Income	Low Income
Constant	-0.15*** (0.01)	-0.20*** (0.02)	-0.13*** (0.02)
Other Earnings	0.47*** (0.02)	0.33*** (0.03)	0.26*** (0.03)
Labour	-0.05** (0.02)	-0.01 (0.05)	-0.16*** (0.03)
Physical Capital	0.04 (0.03)	-0.19*** (0.08)	0.11*** (0.03)
Cost of Funds	-0.12*** (0.03)	-0.27*** (0.06)	-0.07*** (0.03)
Half Square of Other Earnings	0.07*** (0.01)	0.05*** (0.02)	0.22*** (0.02)
Half Square of Labour	-0.04*** (0.01)	-0.07*** (0.02)	-0.04*** (0.01)
Half Square of Physical Capital	-0.03 (0.02)	-0.04 (0.04)	0.02 (0.02)
Half Square of Cost of Funds	-0.09*** (0.01)	-0.12*** (0.02)	-0.07*** (0.01)
Other Earnings*Labour	-0.02*** (0.01)	-0.03** (0.01)	-0.01* (0.01)
Other Earnings* Physical Capital	0.05*** (0.01)	0.07*** (0.02)	0.02 (0.02)
Other Earnings* Cost of Funds	-0.04*** (0.01)	-0.10*** (0.02)	-0.03*** (0.01)
Labour* Physical Capital	0.03*** (0.01)	0.07*** (0.02)	-0.00 (0.01)
Labour* Cost of Funds	-0.02*** (0.01)	-0.02 (0.01)	-0.02*** (0.01)
Physical Capital * Cost of Funds	0.05*** (0.01)	-0.06*** (0.02)	0.06*** (0.01)
EFFICIENCY RESULT			
Economy Specific Variables	All Countries	Medium Income	Low Income
Constant	-1.19*** (0.16)	-1.20*** (0.26)	0.09*** (0.01)
Private Sector Credit as % of GDP	-1.98### (0.32)	-2.90### (0.62)	2.54### (0.27)
Domestic Bank Assets as a % of GDP	6.23*** (0.72)	7.70*** (1.28)	-1.46*** (0.28)
Liquid Liabilities as a % of GDP	4.82*** (0.60)	-6.21*** (1.02)	-0.21 (0.13)
Inflation	-0.00*** (0.00)	-0.01*** (0.00)	0.00*** (0.00)
$\sigma 2$	0.33*** (0.02)	0.53*** (0.07)	0.06*** (0.00)
γ	0.76*** (0.02)	0.83*** (0.03)	0.00 (0.00)
Log likelihood	-912.22	580.71	-52.09
Likelihood ratio test	209.31	164.18	111.46

*Note: Figures in parenthesis ( ) are the Standard error of the variables. The symbols of ***; ** and * depicts 1%; 5% and 10% level of significance for the coefficients and with the expected sign while ###; ## and # depicts 1%; 5% and 10% level of significance but the sign of the coefficient does not tally with the literature.*

A previous submission in this paper is that there seems to be a positive correlation between income level and the various proxies for financial development earlier discussed. This result therefore reinforces that assertion and suggests that the poor level of development of the financial sector in the low-income economies is a major factor for inefficiency. It also suggests that efficiency is important for banks in Africa (including medium and low-income countries), but the current level of efficiency in the low-income countries is poor. The result did not make any appreciable difference when other earnings are the output variable. Rather, the coefficient for gamma (γ) for low-income countries is not significant. Other variables follow similar line of discussion as enumerated above in all the results. The same observation applies when other operating income is the output variable in table 5.5 below.

Table 5.5: Estimation Output of Cost Efficiency with Other Operating Income as Output Variable for African Countries 1998 – 2007

Bank Specific Variables/Country Combination	All Countries	Medium Income	Low Income
Constant	-0.11*** (0.01)	-0.18*** (0.01)	-0.17*** (0.04)
Other Operating Income	0.41*** (0.02)	0.28*** (0.03)	0.11*** (0.03)
Labour	-0.10*** (0.02)	-0.04 (0.05)	-0.25*** (0.02)
Physical Capital	0.05 (0.03)	-0.12 (0.09)	0.21*** (0.03)
Cost of Funds	0.15*** (0.02)	-0.00*** (0.06)	0.07*** (0.02)
Half Square of Other Operating Income	0.11*** (0.01)	0.05*** (0.02)	0.28*** (0.02)
Half Square of Labour	-0.05*** (0.01)	-0.06*** (0.02)	-0.04*** (0.01)
Half Square of Physical Capital	-0.07*** (0.02)	-0.13*** (0.03)	0.03** (0.02)
Half Square of Cost of Funds	-0.02*** (0.01)	-0.09*** (0.02)	-0.05*** (0.01)
Other Operating Income*Labour	-0.02** (0.01)	-0.04*** (0.01)	0.01* (0.01)
Other Operating Income* Physical Capital	0.05*** (0.01)	0.11*** (0.03)	0.01 (0.01)
Other Operating Income* Cost of Funds	-0.07*** (0.01)	-0.18*** (0.02)	-0.07*** (0.01)
Labour* Physical Capital	0.04*** (0.01)	0.12*** (0.02)	-0.01 (0.01)
Labour* Cost of Funds	-0.03*** (0.01)	-0.06*** (0.01)	-0.02*** (0.00)
Physical Capital * Cost of Funds	0.07*** (0.01)	0.00*** (0.02)	0.07*** (0.01)
EFFICIENCY RESULT			
Economy Specific Variables	All Countries	Medium Income	Low Income
Constant	-5.46*** (0.17)	-1.52*** (0.20)	0.15*** (0.04)
Private Sector Credit as % of GDP	-3.78### (0.63)	-3.85### (0.53)	0.38# (0.22)
Domestic Bank Assets as a % of GDP	8.82*** (0.82)	7.65*** (0.95)	0.07 (0.21)
Liquid Liabilities as a % of GDP	4.28*** (0.28)	-5.74*** (0.73)	-0.36*** (0.10)
Inflation	0.01*** (0.00)	0.00 (0.00)	0.01*** (0.00)
$\sigma 2$	0.60*** (0.02)	0.53*** (0.04)	0.04*** (0.00)
γ	0.92*** (0.00)	0.90*** (0.01)	0.00 (0.06)
Log likelihood	-254.55	-313.94	319.66
Likelihood ratio test	582.04	351.97	71.39

*Note: Figures in parenthesis ( ) are the Standard error of the variables. The symbols of ***; ** and * depicts 1%; 5% and 10% level of significance for the coefficients and with the expected sign while ###; ## and # depicts 1%; 5% and 10% level of significance but the sign of the coefficient does not tally with the literature.*

From these results, it is possible to postulate that bank loans is a better output variable than the other two output variables. Despite the poor level of the development of the financial sector in the low-income economies, use of bank loans produced some level of significance for the measure of inefficiency (gamma - γ). It is able to explain efficiency in cost estimation function more than the other output variables. The study also suggests that the model is responsive to the definition of the output variable (bank loans).

As earlier mentioned in chapter one, the study further analyses the efficiency of banks in the sub-regions in Africa. There are five sub-regions within the continent namely North Africa; West Africa; South Africa; East Africa and Central Africa. Due to the observation above in respect of bank loans, we use only this variable in this instance as

the output variable. The result consists of five separate estimations, which are in tables 5.6 & 5.7 below.

Table 5.6: - Estimation Output of Cost Efficiency for the Sub-Regions in Africa 1998 – 2007

Bank Specific Variables/Country Combination	NORTH AFRICA	WEST AFRICA	SOUTH AFRICA
Constant	-0.18*** (0.02)	-0.07*** (0.01)	-0.12*** (0.01)
Loans	0.22*** (0.04)	0.39*** (0.03)	0.04 (0.03)
Labour	0.04 (0.06)	-0.04 (0.05)	-0.16*** (0.04)
Physical Capital	-0.03 (0.10)	0.39*** (0.06)	0.27*** (0.07)
Cost of Funds	-0.21*** (0.07)	-0.21*** (0.04)	-0.33*** (0.05)
Half Square of Loans	0.04** (0.02)	0.23*** (0.02)	0.15*** (0.02)
Half Square of Labour	-0.14*** (0.04)	-0.06*** (0.02)	-0.21*** (0.02)
Half Square of Physical Capital	0.08* (0.05)	-0.11** (0.06)	-0.23*** (0.04)
Half Square of Cost of Funds	-0.27*** (0.04)	-0.08*** (0.02)	-0.09*** (0.03)
Loans *Labour	-0.03* (0.01)	-0.04** (0.02)	0.18*** (0.02)
Loans *Physical Capital	0.13*** (0.03)	-0.03 (0.02)	0.11*** (0.03)
Loans * Cost of Funds	-0.26*** (0.02)	0.05** (0.02)	-0.00 (0.02)
Labour* Physical Capital	0.09*** (0.02)	0.04* (0.02)	0.17*** (0.02)
Labour* Cost of Funds	0.01 (0.02)	-0.02 (0.02)	-0.07*** (0.01)
Physical Capital * Cost of Funds	0.00 (0.02)	0.13*** (0.03)	0.13*** (0.03)
EFFICIENCY RESULT			
Economy Specific Variables	NORTH AFRICA	WEST AFRICA	SOUTH AFRICA
Constant	-2.89*** (0.34)	0.12*** (0.04)	-0.51*** (0.12)
Private Sector Credit as % of GDP	-19.06###(2.05)	-0.07### (1.28)	2.33*** (0.84)
Domestic Bank Assets as a % of GDP	13.59*** (1.34)	-0.08 (0.42)	-1.18 (0.83)
Liquid Liabilities as a % of GDP	-4.38*** (0.67)	2.05*** (0.46)	-1.69*** (0.37)
Inflation	0.03*** (0.01)	0.00*** (0.00)	0.00 (0.00)
$\sigma 2$	1.17*** (0.11)	0.04*** (0.00)	0.19*** (0.02)
γ	0.96*** (0.01)	0.72*** (0.03)	0.88*** (0.02)
Log likelihood	-216.47	477.60	161.63
Likelihood ratio test	351.32	118.66	126.68

*Note: Figures in parenthesis ( ) are the Standard error of the variables. The symbols of ***; ** and * depicts 1%; 5% and 10% level of significance for the coefficients and with the expected sign while ###; ## and # depicts 1%; 5% and 10% level of significance but the sign of the coefficient does not tally with the literature.*

Table 5.7: Estimation Output of Cost Efficiency for the Sub-Regions in Africa

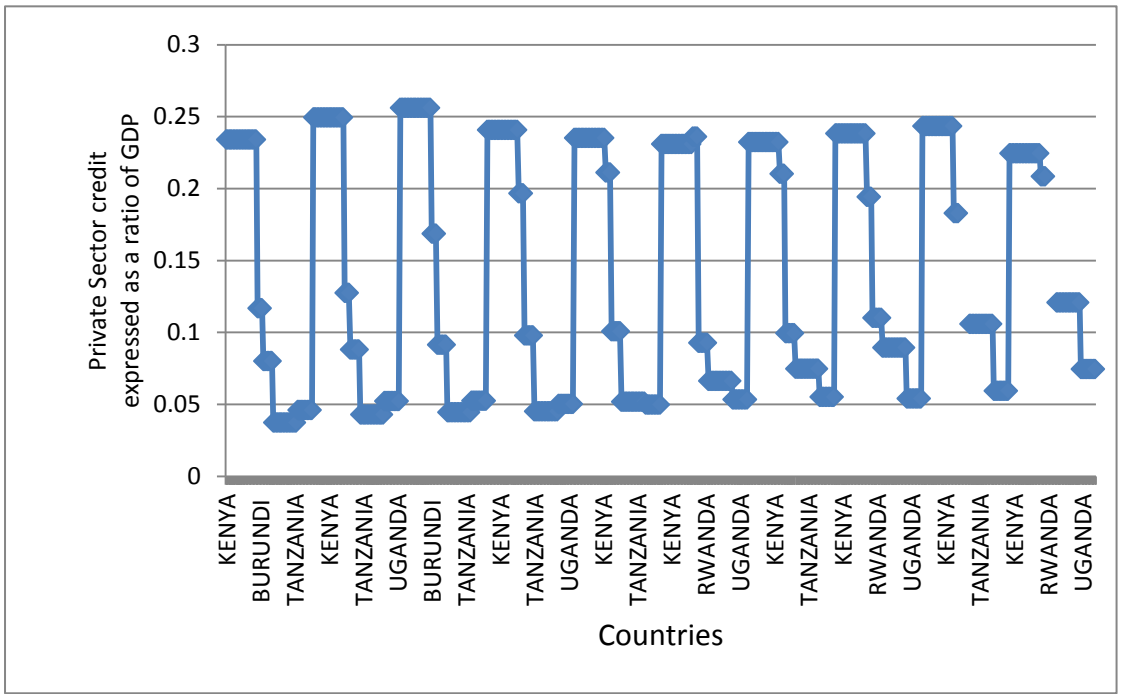
1998 – 2007 (continuation)

Bank Specific Variables/Country Combination	EAST AFRICA	CENTRAL AFRICA
Constant	-0.07*** (0.01)	-0.10*** (0.03)
Loans	-0.13*** (0.04)	-0.32** (0.15)
Labour	0.08** (0.03)	-0.22 (0.17)
Physical Capital	-0.49*** (0.06)	-1.20*** (0.23)
Cost of Funds	0.05 (0.03)	0.09 (0.11)
Half Square of Loans	0.17*** (0.03)	0.61*** (0.14)
Half Square of Labour	-0.01 (0.02)	-0.20** (0.10)
Half Square of Physical Capital	-0.22*** (0.03)	-0.23*** (0.04)
Half Square of Cost of Funds	-0.08*** (0.01)	-0.05*** (0.02)
Loans *Labour	-0.06*** (0.01)	-0.11 (0.08)
Loans *Physical Capital	0.07*** (0.02)	0.15* (0.09)
Loans * Cost of Funds	-0.17*** (0.02)	-0.02 (0.03)
Labour* Physical Capital	0.01 (0.01)	-0.09 (0.06)
Labour* Cost of Funds	-0.01*** (0.01)	0.06 (0.04)
Physical Capital * Cost of Funds	0.05*** (0.01)	-0.02 (0.04)
EFFICIENCY RESULT		
Economy Specific Variables	EAST AFRICA	CENTRAL AFRICA
Constant	-5.23*** (1.23)	0.17*** (0.05)
Private Sector Credit as % of GDP	11.29*** (2.76)	-0.85 (2.11)
Domestic Bank Assets as a % of GDP	-21..70*** (4.96)	-7.81*** (3.00)
Liquid Liabilities as a % of GDP	18.79*** (4.19)	3.15*** (1.07)
Inflation	-0.03*** (0.01)	-0.00*** (0.00)
$\sigma 2$	0.46*** (0.10)	0.03*** (0.00)
γ	0.98*** (0.00)	0.52*** (0.14)
Log likelihood	352.01	76.99
Likelihood ratio test	119.64	15.13

*Standard error in parenthesis while ***, ** and * denotes 1%, 5% and 10% level of significance*

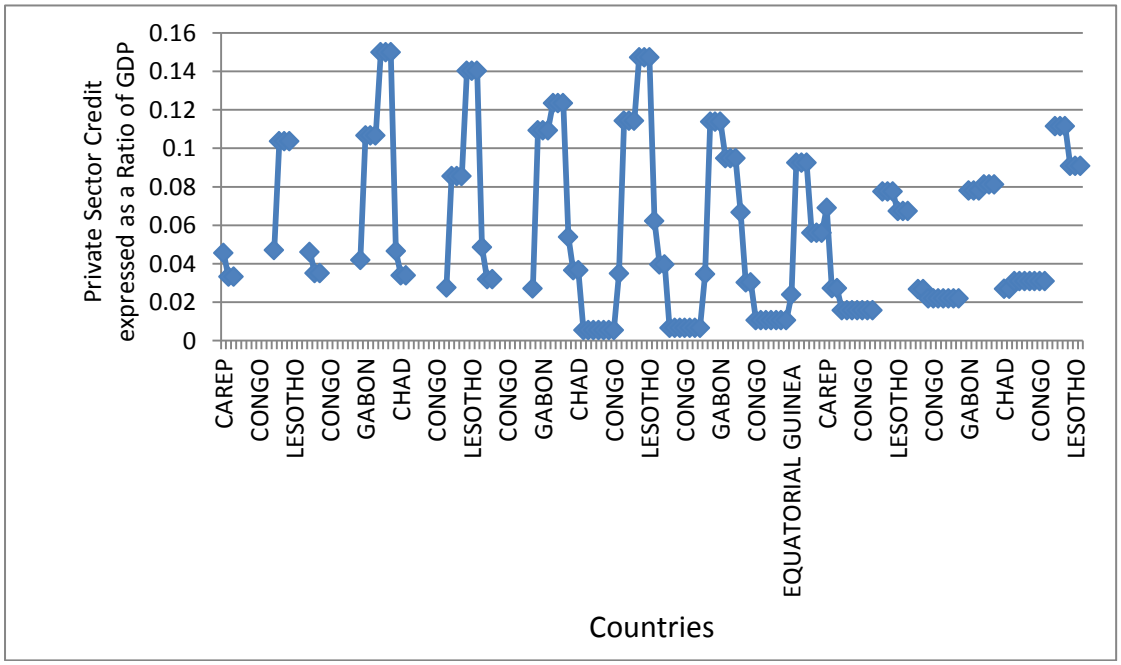
From the result, the highest efficiency is attributable to East Africa with 0.98, followed by North Africa with 0.96; South Africa with 0.88 and West Africa with 0.72. The astonishing aspect is the result for Central Africa, which shows an efficiency level of 0.52. This implies that most of the inefficiency attributable to the continent is a result of the inefficiency of the Central African countries. One basic observation is that this sub-region is the only place where private sector as a percentage of GDP is not significant. Consequently, I chart the variable for the most efficient sub-region and the least efficient sub-region. A perusal of the charts in figures 5.6 and 5.7 presented below show that the private sector credit for the most efficient sub-region in Africa (East Africa) ranges between 0.03 and 0.26 while that of the least efficient sub-region ranges between 0.00 and 0.15. This suggests that when private sector credit is below a specified minimum level, it may not be capable to support the efficiency of the institutions sufficiently.

Figure 5.6: Private Sector Credit as a ratio of GDP for East African Countries



Source: - The World Bank Development Indicator (2007)

Figure 5.7: Private Sector Credit as a ratio of GDP for Central African Countries



Source: - The World Bank Development Indicator (2007)

This assumption therefore supports the postulation of Rioja and Valev (2003) which postulates that there is a minimum threshold of 14% for private sector credit to attain before it can positively impart the economy. If we apply this postulation to the Central

African countries, only three countries attain this minimum threshold. This could be one of the reasons why there is high level of inefficiency within the sub-region.

5.5 Conclusion

In this chapter, I investigate the level of efficiency of banks in Africa over ten years. The SFA methodology is used and the countries divided according to the level of income of the respective countries. The work involves use of three output variables and three input/netput variables. The estimation with countries income classification includes introducing the output variables individually into the model. This results in nine different estimations. The translog function estimated shows that the level of inefficiency of the financial sector ranges from about 10-26 percent. The result for the estimation according to the income classification of the countries shows that much of the inefficiency within the continent is attributable to the low-income countries. The efficiency of the medium income countries is even higher than the average within the continent. However, when I classify the countries according to the sub-regions in Africa, it shows that income classification of countries does not fully account for efficiency of the financial institutions. The Central African sub-region that has more middle-income countries than areas like the West African sub-region is the least efficient. The sub-region also has the coefficient for private sector credit insignificant. This suggests that the volume of intermediation to the growth-promoting sector of the economy (private sector credit) is also important in determining the level of efficiency of the financial institutions.

Much of the inefficiency within the continent is a result of poor intermediation and possibly low skilled staff. This is because the labour cost is small and has negative correlation with total cost. Similarly, the macro-economic variable proxied by private sector credit expressed as a percentage of GDP also carries a negative coefficient. This explains the under-development of the sector.

An observation from this study is that the level of intermediation to the private sector by these banks is important for inefficiency. This is in addition to the seeming under development of the capital market, which places a lot of reliance on the money market. Where inefficiency exists, it is bound to have serious impact on the economies. Banks in Africa, mostly those in the low-income countries should be poised to eliminate inefficiency through reduction in cost of banking transactions and by ensuring good level of intermediation mostly for the real sector of their economies.

CHAPTER SIX

SUMMARY AND CONCLUSIONS

6.0 Introduction

I base this thesis on three empirical studies on Africa. In this chapter, I will give a summary of the findings and observation from this thesis. After this, we will examine the implications of these findings and make suggestions that will assist to resolve the issues highlighted herein. In the last part of this section, I will make a note of areas that are possible to extend research to in the future. The chapter one of these theses introduces the work. It includes motivations for the work and what it sets out to achieve.

6.1 Summary of Findings and Observation

Chapter Two: - General Background to the Study

In chapter two of this thesis, I examine institutions and the financial sector with emphasis on the banking sector for Nigeria and Africa as a whole and suggest that the institutional framework in Africa is not really supporting the development of the banking sector. Of importance is the cost of credit and emphasis on collateral, which is a bane to easy access by the firms. This impedes financial intermediation and subsequently disturbs economic growth. In addition to that, the banks are small and not positioned for the challenges of financial intermediation within their respective economies. It also suggests that most of the countries are cash dependent as they have almost the same ratio of currency to their base money outside the banking system. Similarly, the countries have liquid liabilities greater than private sector credit which suggests the level of financial under-development within the continent. Lastly, most development indices considered in this study are very low and further buttresses the under-developed nature of the financial institutions. As earlier mentioned, the above observation supports the World Bank statement on Africa that there is still a lot to do for the continent to positively channel the resources in a way that will support growth.

Chapter Three: - Bank Credit and Economic Growth

The first empirical chapter, which considered bank credit and economic development in Nigeria, examined the issue of causation with a view to determine the direction of relationship between financial development and growth. The paper finds that the relationship is bi-directional because growth seems to be the leading factor that is driving financial development in the country. This observation is similar to the postulation of Rioja and Valev (2004) that where the level of financial development for a country is below the minimum threshold, it will not be able to affect the economy positively to attain the desired growth. The position depicted with this finding is that the financial institutions are not really supporting the firms adequately to enhance productivity, but when the economy expands, it creates a demand on the financial institutions, which eventually results in development on the part of the financial institutions. This situation is not a good type of relationship between the two aspects of the economy. In the early part of this work, I discuss the various views on the role of financial development on growth. Quite a lot of previous researchers described the relationship that financial development causes growth. This is the ideal situation, which when lacking in an economy affects the rate of growth. With this scenario, there is the need to change the current type of relationship to that, which promises to support growth.

In addition to the above finding from the first empirical chapter, the findings suggest that exports, which are a major economic activity for the country, do not positively relate to financial development. Exports of oil exhibit the same type of negative relationship with financial development. This is a big surprise for a country, which had the contribution of oil and non-oil to total export as 57.6% and 42.4% in 1970. These rates subsequently increased and reduced to 98.3% and 1.7% respectively for oil and non-oil export by 2005. However, exports of non-oil have a positive effect on financial development. The coefficient is very large. What is more puzzling here is that Nigeria is the eight largest exporter of oil in the world. Now, this highly important economic activity does not have a positive effect on financial development. Again, this finding is adduced to a poor integration of the financial system with the real sectors of the economy such that these institutions are not intermediating for majorly the multi-nationals who handle the oil exportation business for the country with a view to be able

to increase their productive capacity. This will eventually lead to increase in the productive base of the economy. In essence, the financial institutions are not active in the supply and demand of finance for export activities because the government keeps export proceeds with the Central Bank while the users of export finance seek for funds outside their local environment. If the financial institutions are active in this area, it will increase the productive base of the economy which will result to growth and vice versa.

Apart from export of non-oil, some other economic activities such as imports and foreign capital inflow have significant and positive relationship with financial development. In this work, imports have a large coefficient. This I interpret to mean that the financial institutions intermediate for importation. Foreign capital inflow, though significant at 1%, has a tiny coefficient. This measure is highly volatile, hence not efficient for financial institutions to depend on it as a source of fund for their intermediation purposes. My results also highlight the importance of correct specification of the model in order to provide meaningful and testable hypotheses. Specifically, I find that the use of bivariate models is not appropriate in this work.

Chapter Four: - Financial Development and Economic Growth in Africa: Lessons and Prospects

For the second empirical chapter, I examine the relationship between the financial system and economic growth in thirty-one countries in Africa. The research uses the variables as proposed by King and Levine (1993a) and attend to the criticisms of the paper over four issues namely the use of cross-country methodology; the combination of various countries that have different levels of development; not taking the causational issue into consideration and lastly the non-inclusion of money outside the banking industry. I suggest empirical explanation and analysis that treats these criticisms. My findings show that the relationship between financial development and economic growth is bi-directional. This is because all the proxies of growth and financial development exert influence on each other. The two methods that I use - IV/GMM and OLS give the same result. The work also show that trade represented by exports and imports is very important in the growth generation process for the continent. It is

difficult to define the result for government expenditure, because some coefficient had negative sign while others had positive sign. However, that of trade was much more settled and convincing.

For the factors that mobilise financial development, trade has negative sign in all the regressions, while government expenditure does not provide a stable result. Some regressions have negative sign while others have positive sign. From this analogy, I postulate that trade is very useful for economic growth, but not currently useful for financial development in Africa. Based on the findings in the first empirical paper about the importance of foreign capital inflow, I use the variables as defined by Crowley (2008) in a panel regression for thirty-three African countries. The result is similar to the observation in respect of Nigeria and further affirms the fact that trade does not aid financial development because the coefficient is negative in all the regressions. Imports and foreign capital inflow are significant and positive. Specifically, the coefficient for imports is large, but that of foreign capital inflow is very tiny. This result buttresses my findings earlier in this thesis on Nigeria and makes it easy to postulate that the description typifies the situation in the less developed countries, particularly in Africa.

Based on this finding, it may imply that the economic climate in Africa does not allow proper financial intermediation by the banks which consequently retards growth. Likewise, the poor state of financial intermediation along with institutional factors proffers plausible explanation for the inability of the financial institutions to intermediate for both the supply and demand of export.

Chapter Five: - Bank Efficiency in Africa

The third empirical chapter examines the efficiency of the banking sector over a period of ten years and use the SFA methodology. The approach involves a one output and three input/netput variables. I also use the translog function and observe that the level of inefficiency within the financial system ranges between 10 – 26 percentages. When I

divide the countries according to the income classification, it shows that much of the inefficiency within the continent is attributable to the low-income countries. The efficiency of the middle-income countries is higher than the average within the continent and compares favourably with what is obtainable in other middle income and possibly high-income countries in the world.

A further analysis in that chapter when I divide countries based on the sub-regions within Africa show that the Central African sub-region is the least efficient. East Africa and North Africa have very high and comparable efficiency output. Other sub-regions are not below 0.70 efficiency level. However, the Central African sub-region consists of many middle-income countries such as Gabon, Lesotho and Congo Republic. This observation suggests that countries income classification is not sufficient to explain the efficiency level of the financial institutions. I also find that the coefficient for Private Sector Credit which is not significant in the Central African sub-region has opposite effect in the other regions. A further look at this variable shows that this sub-region actually has the lowest ratio of Private Sector Credit to GDP over the years. This again points to the significance of financial intermediation in determining the level of development within the continent. It also suggests that low volume of Private Sector Credit affects the efficiency of the financial sector negatively and vice versa.

Another observation in this chapter is that the cost of labour is very small and has negative correlation with total cost. I am of the opinion that a good number of the staff in these countries are not appropriately skilled hence the poor wages. The world is now a global village with relatively easy opportunity to migrate if one has the required skill. Where this is not the case, they will have to remain in their country and take whatever wages they offer to them. Similarly, the macro-economic variable proxied by private sector credit expressed as a percentage of GDP carries a negative coefficient. This may be because of poor intermediation hence a pointer to possible under-development of the financial sector. It is pertinent to state that the financial sector is important due to the seeming under-development of the capital market. Therefore, any form of inefficiency by the so much relied upon banks is likely to have a serious impact on the economies.

6.2 Recommendations

The studies in this thesis have highlighted quite a number of observations and findings, which the government can examine with a view to change the situation. I discuss the cost of credit, which is too high, and the margin between deposit rate and lending rate is wide. The government needs to reduce the rate for open market operation and encourage banks to operate within the stipulated guidelines. The regulatory organs should have powers to punish erring banks and allow openness in the regulation of the banks such that the public is aware of the banks that are unwilling to co-operate with the government for growth of the country. The government in Africa should focus on corruption with a view to exterminate it from the society and also have a detailed record of the populace which will aid accountability by the residents. The detailed record maintained by the advanced countries does not permit anyone to commit any act of illegality and get away with it. This will encourage the banks to consider downplaying their undue reliance on collateral before granting credit. It will eventually assist the populace to have easy access to credit, thereby enhancing the productive base of the economy over time because of increase in credit to the private sector.

The size of the banks should receive proper focus from the government. It is a good thing that some of the countries currently engage in reform of the financial sector while many aim at improving the size of the sector. This will inculcate more banking habit on the populace; increase bank to customer ratio. Adopting this type of policy will take banks closer to people and reduce excessive dependence on cash. The government should also ensure policies that allow the proceeds of exports and expenditure to pass through the banking system to aid the intermediation process and assist the development of the financial sector. Specifically, the increase in the size of banks will reposition the banks better to be capable of meeting up with the financial needs of the multinational companies in their country. This process should accompany reduction in the cost of credit to make a meaningful impact. As multinationals, it is easy for them to obtain credit anywhere that is cheaper. In as much as they will increase the size of banks, appropriate incentive can be in place to motivate the multi-nationals to look inwards for credit. Where the proceeds and expenditure of exports is channelled through the

banking sector, it will likely reduce their dependence on foreign capital inflow which is highly volatile.

The government should endeavour to put policies that will encourage the activities of the capital market for long-term funds. It will also reduce the present over-dependence on the financial market as the main source of financial intermediation. The banks should continuously try to improve the skill of their staff to what is comparable with the advanced economies and provide adequate remuneration so that they can attract the best skills around into the industry. Lastly, the countries should look into data availability. Many studies are not possible on crucial areas within the continent because the data is not available while similar data are readily available for the advanced countries. Availability of data will allow more research into many areas that could offer solution to some issues within the continent. The inclusion of any country into the studies in this thesis is as a result of data availability.

6.3 Suggestions for Further Research

One major limitation often adduced to panel studies is that it sometimes generalises for cross sections, which may result in inaccurate inferences (Luintel et al 2008) as such, may not really be country specific. It also states that such approach suffers from measurement and statistical errors (Levine and Zervos 1996). However, this research uses the combination of both time series and panel data estimation that produces identical results. Therefore, this study assumes that it has been able to overcome this limitation. Nonetheless, it is still possible to assume that the result of the causal relationship for the African countries may not necessarily be the case for all the countries. It is possible that the use of time series will proffer some country specific results in this case.

This research work in the first and second empirical papers has observed the negative relationship of exports to financial development which I relate to the size of the banks. It is also a good thing to observe that some of the countries are already embarking on reforms to improve the size of the banking sector. A study will be necessary in no

distant future to appraise whether the effect of these reforms are able to address these issues. Specifically, they could study the role of the multi-nationals to ascertain where they currently source for funds for their operational activities and the factors that could motivate them to look inwards for this requirement.

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