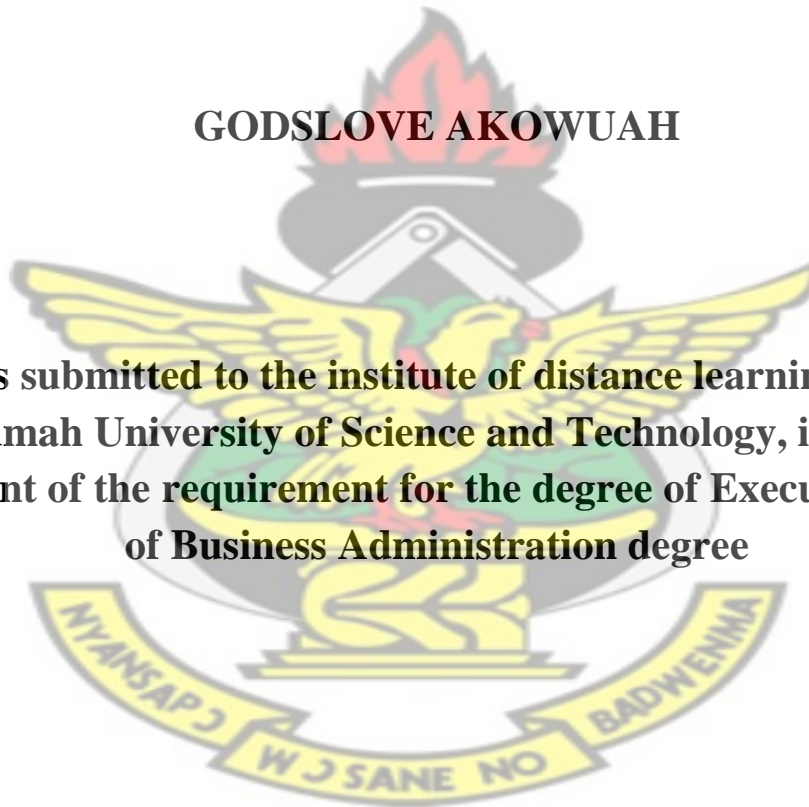


**INTEREST RATES AND THE DEMAND FOR CREDIT IN
GHANA**

KNUST
BY

GODSLOVE AKOWUAH

**A thesis submitted to the institute of distance learning, Kwame
Nkrumah University of Science and Technology, in partial
fulfillment of the requirement for the degree of Executive Master
of Business Administration degree**



MAY, 2011

DECLARATION

I hereby declare that this submission is my own work towards the award of the Commonwealth Executive Masters in Business Administration (CEMBA) and that to the best of my knowledge, it contains no material previously published by another person or any material which has been accepted for the forward of any other degree of the University, except where due acknowledgement has been made in the text.

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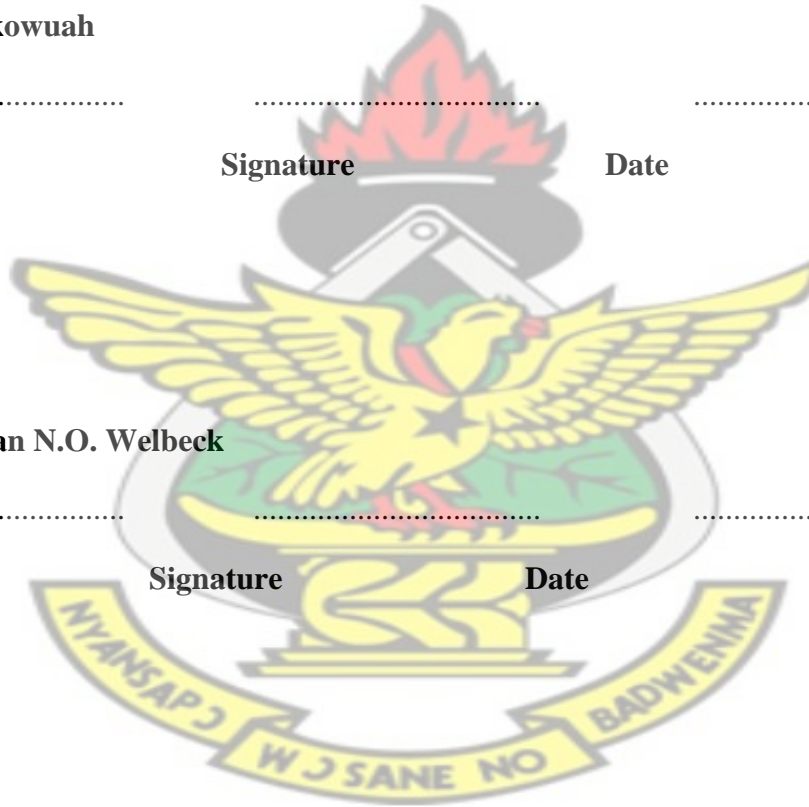
Prof. Kwame Dontwi

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ACKNOWLEDGEMENT

I am ever grateful to the almighty God, the Creator and the Guardian, and to whom I owe my very existence. His guidance, care and love are amazing.

This dissertation, while an individual work, benefited from the insights and direction from the following. First, my Supervisor, Mr. Jonathan Welbeck exemplifies high quality scholarship to which I aspire. He provided insights that guided and challenged my thinking, substantially improving my work. Second, I extend a warm gratitude to all lecturers of the Commonwealth Executive MBA program. Third, I am grateful to all non-teaching staff for the various contributions they made towards my training.

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Nevertheless, I must proclaim my acceptance of all remaining errors.

Godslove Akowuah

(May, 2011)

ABSTRACT

This study examined the impact of interest rates on the demand for credit in Ghana between 1970 and 2010. It was in line with the numerous theoretical inconsistencies as to whether effective financial intermediation could be undertaken at relatively high or low interest rates. While the propositions are supported by a variety of empirical evidences and sounds interesting, the evidence in Ghana appeared mixed. This study therefore used the Johansen Cointegration approach to examine the issue. The results indicate interest rates have a positive impact on the domestic demand for credit in the short run and a negative relationship in the long run. . While increases in the real lending rate may not immediately hamper the demand for credit, it may eventually lead to a fall in the demand for credit in the long run. (and vice versa). In that direction, if market forces tend to put an upward pressure on prices, authorities should take advantage of that and make more credit available. Alternatively, if authorities want to reverse the negative short run or positive long run link between the real lending rate and the demand for credit, emphasis should be placed on price stability.

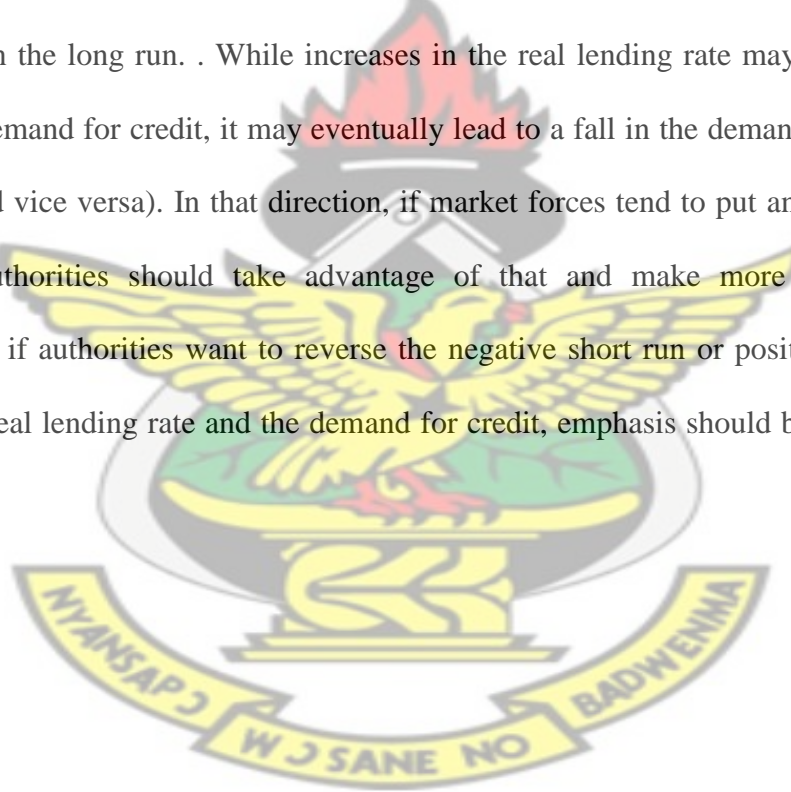


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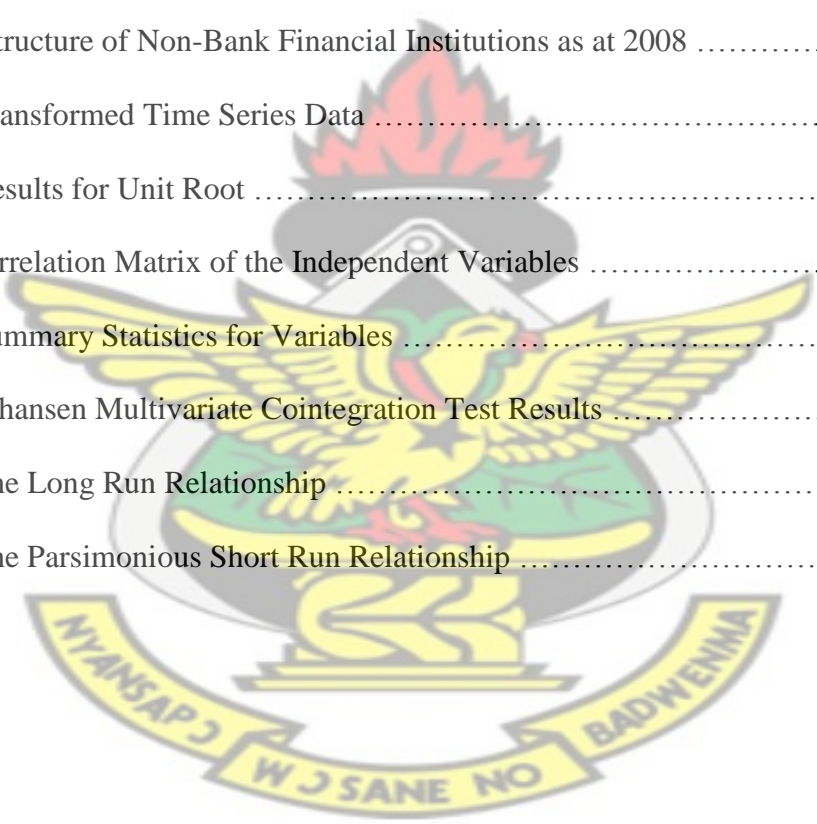
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CHAPTER ONE

INTRODUCTION

1.0 Background

There is perhaps no set of prices over which governments throughout the world would have exerted more direct or indirect control than institutional interest rates. While such rates are crucial in the efficient allocation of investible funds, effective domestic resource mobilization, and the achieving of major macroeconomic objectives, there is a growing belief that a rise in institutional interest rates is tantamount to the crowding out of private sector investments. Hence, a reduction is a necessary pre-requisite for private sector investments to boom.

Unfortunately, this growing belief seems to be inconsistent with the widely known theoretical framework of McKinnon (1973) and Shaw (1973). The McKinnon and Shaw hypothesis shows that a low real interest rate is a disincentive to savings, thereby reducing the availability of credit for investments. Thus the financial sector should be liberalized for interest rates to be determined by the forces of demand and supply. In that way, nominal and real interest rates will increase savings mobilization, thus deepening the financial intermediation process. However, the modern view of interest rates propounded by Hoff and Stiglitz (1990); Stiglitz and Weiss (1981) depicted that at high interest rates, financial intermediaries might resort to non-price mechanisms such as credit rationing to allocate funds due to the problem of information asymmetry, a situation which will further fragment the financial market.

The McKinnon (1973) and Shaw (1973) theoretical framework has been the basis of financial reforms for many developing countries, including Ghana. Although some gains have been made as a result of the reforms, many challenges still remain. High interest rates encourage savings but at the same time serve as a constraint to access to credit by businesses that are unable to borrow at such rates. According to the Association of Ghana Industries (AGI) business barometer report, the cost of credit has been the number one constraint to business growth for many years until the last quarter of 2010, where it was overtaken by access to credit. The AGI president attributed the problem to the desire of the banks to minimize their non-performing loans which made them to greatly reduce their loans to businesses (AGI's Business Barometer Report, December 2010)¹.

Developments in the financial sector of Ghana have also demonstrated that the financial sector reforms of the late 1980's, which was basically based on the theoretical framework of McKinnon and Shaw has exacerbated high interest rates and high urban bias of bank concentration. For instance, the Minister of Finance, Ghana, had remarked that the Government of Ghana views with great concern the high cost of borrowing and lending in the banking system (Amonoo et al. 2003). To him, this phenomenon does not augur well for investments and much more particular, investments by Small and Medium Sized Enterprises. This problem is further aggravated by the high spread between the lending and borrowing rates.

¹The Association of Ghana industries (AGI) Business Barometer report is a periodic opinion survey about what chief executives make of the business environment.

A recently disturbing phenomenon is the inadequate evidence on the factors that influence recoveries of bank loans either in or out of a default state. This issue has taken a heightened importance as recent literature determine required capital holdings by using a model-based estimate of “loss given default” which depends on recovery rate.

This state of affairs calls for an in-depth analysis of the relationship between interest rate and the demand for credit. This focus is critical, as it is expected to ignite debates on policy shifts away from the theoretical beliefs of McKinnon and Shaw to the rather well-known Keynesian interest rate paradigm as well as provide policy recommendations on how the private sector can be the main engine of growth.

1.1 Statement of the Problem

While the McKinnon and Shaw theoretical framework posits low real interest rates is a disincentive to savings, thus the financial sector should be liberalized for real interest rates to increase, thereby reversing the disintermediation process and increasing the availability of credit, the models of Stiglitz and Weiss (1981) assert interest rates cannot be the main allocator of credit as it can be used as a screening device between high risk and low risk borrowers who rather have the potentials to invest. More currently, there is the growing belief that interest rates must be low for private investments to be boosted. It thus appears there is some level of inconsistency in the linkage between interest rates and the demand for credit.

Unfortunately, the empirical evidence cannot help matters. For instance, the financial and economic crises period of Ghana was characterized by negative real interest rates due to excessive government borrowing and the government's refusal to adjust the nominal interest rate. This discouraged savings mobilization and investments. Ghana, following the theoretical underpinnings of McKinnon and Shaw, then reformed her economy. Real interest rates increased, yet there was the view that the increase in the rates has discouraged private investments.

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How then can the link between interest rate and credit be reconciled in Ghana? It is thus the purpose of this study to examine this issue.

1.2 Objectives of the Study

The main objective of this study is to examine the impact of interest rates on the demand for credit, with the following specifics:

1. To investigate the relationship between interest rates and demand for credit
2. To find out the effect of expected inflation on the demand for credit.
3. To determine the relationship between the level of output and the demand for credit.

1.3 Research Questions

1. What is the effect of interest rates on the demand for credit in Ghana?
2. Do lower inflationary expectations imply an increase in demand for credit?
3. Is there any relationship between the level of economic activities and the demand for credit?

1.4 Justification of the Study

First, linking interest rates to the demand for credit in Ghana will provide basis for comparison of the McKinnon and Shaw theoretical framework and that of their critics. Second, Ghana exhibits positive signals to the international community, thus linking interest rates and the demand for credit will confirm if the country must be the financial gateway to the African Sub-Region.

1.5 Research Methodology

The study followed the analogy by Calza et al. (2001) and Qayyum (2007), and modeled the impact of interest rates on the demand for credit as a Vector Autoregressive model. Using annual time series data from the Ghana Statistical Service from 1970-2007, the Johansen Cointegration technique is employed for estimations. The choice of the period for study was motivated by data availability. More details about the methodology are provided in chapter 4.

1.6 Organization of the Study

The study is in six chapters. This current chapter discussed the background, statement of the problem, objectives, research questions, justification and research methodology of the study. Chapter two focused on the overview of financial sector developments in Ghana. Chapter three presented a summary of the existing theoretical and empirical literature. Chapter four deliberated on the methodology used for the study. Chapter five presented and discussed the empirical results obtained during the study and lastly, chapter six was devoted to the summary

of the various findings of the study and their implications. It also highlights the limitations of the study and makes recommendations for future research.

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CHAPTER TWO

OVERVIEW OF THE FINANCIAL SYSTEM IN GHANA

2.0 INTRODUCTION

This chapter focuses on financial sector developments in Ghana beginning from the colonial era up to the present period. The idea is to preview various policies and strategies that were undertaken in Ghana.

2.1 DEVELOPMENTS IN THE FINANCIAL SECTOR

The developments in the financial sector is analyzed under four sub-headings: the pre independence period, post independence period, the financial sector reform period with emphasis on the Financial Sector Adjustment Programme (FINSAP); and the post adjustment period. The colonial period provides a brief summary of the evolution of banking in Ghana. The post independence period evaluates the state of Ghana's financial sector which was dominated by state-owned financial institutions and can generally be described as underdeveloped.

2.1.1 THE PRE INDEPENDENCE PERIOD

The main objective of monetary policy during the colonial era was to achieve monetary stability, and as such, growth in the money stock was tied to export performance. In order to provide banking services for British enterprises and the colonial administration, the Bank of British West Africa Limited (Now Standard Chartered Bank) was set up in 1896, its main

objective was to import silver coins from the Royal Mint. The period 1912-1957 witnessed the operations of the West African Currency Board (WACB). Although the WACB operated a sterling exchange standard through a guaranteed convertibility of the West African pound to sterling, it did not possess the powers of a central bank (See Mensah, 1997). For instance, the WACB did not have any control over the volume of currency to be issued. According to Mensah (1997), the primary function of the financial sector during the colonial era was essentially the provision of currency infrastructure for the Ghanaian economy which culminated in the transformation of the economy from a barter system to a modern currency system. In general, the financial system during the colonial era played a passive role in the development of the Ghanaian economy focusing mainly on traditional banking functions.

2.1.2 POST INDEPENDENCE PERIOD (1960 - 1983)

Ghana's financial sector policies after independence up to the late 1980s can largely be described as repressive as in the sense of McKinnon (1973) and Shaw (1973). The post independence period witnessed widespread government intervention in the financial sector due to perceived market imperfections and the colonial-based structure of the financial system at the time which was incongruous with the local condition. In the immediate post independence era the government of the day pursued a socialist development strategy aimed at developing the country through state control of the economy. This era was characterized by a comprehensive system of import licensing, exchange rate controls, quantitative restrictions on interest rates and directive credit policies aimed at lending to the sectors of the economy which were prioritized by the government.

In order to implement the above policies among other things, the Bank of Ghana (BOG) was formally established by the Bank of Ghana Ordinance (No. 34) of 1957 on 4th March, 1957. The principal objects of the new central bank, as enshrined in the 1957 ordinance, were "to issue and redeem bank notes and coins; to keep and use reserves and to influence the credit situation with a view to maintaining monetary stability in Ghana and the external value of the Ghana pound; and to act as banker and financial adviser to the Government (Bank of Ghana, 2006). Owing to the changing macroeconomic conditions, The Bank of Ghana Ordinance (No.34) of 1957 was repealed and the Bank of Ghana Act (1963), Act 182 was enacted, which is considered to be more development oriented.

The successful establishment of the central bank facilitated the setting up of other financial institutions such as commercial banks, development banks, nonbank financial institutions (NBFIs) and rural banks between the early 1960s and the late 1970s. It should be noted that the Bank of Gold Coast (now Ghana Commercial Bank) was established in 1953 in response to the agitation from indigenous Africans for an indigenous bank that will pay attention to their borrowing needs in order to improve access to credit by local businesses and farmers. In addition to the Ghana Commercial Bank, the government also acquired 40% equity stake in the two foreign banks, Barclays Bank and Standard Chartered Bank in line with an indigenization decree enacted in 1975. The Social Security Bank (SSB) was also set up in 1977 to provide credit including longer term loans for businesses and consumers. It grew rapidly to become the second largest bank in Ghana, with 18% of deposits following Ghana Commercial Bank which was the biggest bank with a total bank deposit of 36% in the late 1980s (Brownbridge and Gockel, 1996, pp. 2). Apart from the above mentioned commercial

banks two other important commercial banks were established in 1975. These were the national savings and credit bank (NSCB) formerly referred to as the Post Office Savings Bank and the Ghana Cooperative Bank. The rationale is to provide consumer loans and credit for small scale industries and cooperative societies in the country.

With the believe that certain sectors in the economy such as agriculture and industry require special attention to aid faster development of the economy, development banks with specialized functions were set up to cater for their financial needs. The National Investment Bank was established in 1963 with the aim of mobilizing funds to finance medium and long term investments in the industrial sector. Subsequently the Agricultural Development Bank (ADB) and the Bank for Housing and Construction (BHC) was set up in 1965 and 1973 to provide credit to the agricultural sector and the housing industry respectively. A merchant bank, Merchant Bank Ghana was set up in 1972 as a joint venture between the government of Ghana and some strategic investors to provide comprehensive corporate banking services. Its main functions include; taking wholesale deposit of corporate funds; proving venture capital; dealing in stocks; financing of imports and exports; term lending to the corporate sector; as well as providing financial consultancy and advisory services.

By the late 1970s, research conducted to evaluate access to credit by small scale farmers in the rural sector has shown that the Agricultural Development Bank did not have the capacity to achieve the desired target (Mensah, 1997). It therefore became imperative to establish a rural banking system to complement the existing scheme. To ameliorate the poor access to credit by rural communities, the Central Bank in 1976 initiated the rural banking concept

with the primary objective of mobilizing financial resources and further allocating them to finance viable rural based economic ventures. Two rural communities, Agona Nyakrom, a crop farming community and Biriwa, a fishing community were chosen as pilot projects to experiment the idea of rural banking. The success stories of the two rural banks serve as the basis for the establishment of many other rural banks across the length and breadth of the country to improve access to rural finance.

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In the nonbank financial sector, a number of nonbank financial institutions (NBFIs) were also established. The State Insurance Company (SIC) was set up in 1962 to provide insurance services for all government institutions and parastatal organizations. Due to its monopoly power over the government sector, the company has grown to become the largest insurance company in the industry. The number of insurance companies has grown to 18 by the end of 1986. As at January 2010, the insurance industry is made up of 23 Non-life companies, 17 Life companies, 2 Reinsurance companies, 40 Broking companies, one Reinsurance broking group, one loss adjusting company and about 4000 insurance agents (National Insurance Commission, 2010)²

In an attempt to provide reasonable retirement benefit for workers, a pension scheme designated as the Social Security and National Insurance Trust (SSNIT) was established in 1972 under NRC decree 127. SSNIT was given the mandate to mobilize funds from employees in the form of social security contributions and to provide retirement package to participating workers.

² Information was extracted from the website of the national insurance commission, may, 2011

The National Trust Holding Company (NTHC) was set up in 1976 under the auspices of the National Investment Bank to facilitate the implementation of the national investment decree, NRC decree 239 of 1975 which required foreign firms operating in Ghana to offer not less than 40% of their capital to Ghanaians as equity investment. NTHC was tasked to acquire the shares of foreign companies and sold them to Ghanaians in what was essentially an over-the-counter market. The establishment of NTHC is considered a precursor to the emergence of a formal capital market in Ghana.

The Consolidated Discount House Ltd (CDH) which is considered as the nucleus of Ghana's money market began its operation in 1976. It has been mandated to take very short-term deposits from banks; discounting commercial bills of exchange; underwriting treasury bills; and providing a market for short-dated government bills. The performance of the above mentioned functions is to enable businesses manage their liquidity positions efficiently. The impact of CDH operations in the money market can be described as highly successful. Excess cash reserves which constituted 18.8% of deposits in 1986 dropped to 2.9% by March 1989 (Mensah, 1997).

During the period under review, the financial system was characterized by excessive governmental regulation which led to inefficiency and underdevelopment. The majority of banking institutions were fully owned by the state and its agencies. The Government resort to borrowing from the banking sector to finance its persistent budget deficits leading to large increases in the money supply and consequently rising inflationary pressures. By the 1970's

nearly 70% of the credit granted by the banks were earmarked either to meet the public sector borrowing requirement (PSBR) or to satisfy the credit requirements of the state enterprises (Mensah, 1997, p.9)

The pre-reform policies pursued by the government coupled with the unstable macroeconomic environment led to severe financial swallowing in Ghana. One important measure of financial depth, the broad money to GDP ratio which was about 20% between the period 1964-1974 rose briefly to 29% in 1976 and then collapsed to 12.5% in 1983 (Brownbridge and Gockel, 1996, p.5). Moreover, there was a high level of currency outside banks with the currency/deposit ratio peaking at 77% in 1983 reflecting a process of disintermediation from the formal financial system (Mensah, 1997, p.10). One of the reasons been cited for the fall in financial depth is the negative interest rate as a result of high inflationary episode which serve as a disincentive to investing in financial assets. Also the freezing of bank accounts and a decree which obliged the banks to give details of customers' account to the government on demand eroded public confidence in holding domestic currency and the patronage of the banking system (Brownbridge and Gockel, 1996). As a consequent, there was increase in informal intermediation activities, portfolio shift from holding local currency to foreign currency as well as acquisition of physical assets such as buildings and construction materials.

In summary, Ghana's financial system during the post independence era was characterized by stringent government regulation, underdevelopment and state dominance of the financial sector. Apart from two banks where foreigners have majority share holdings, the government

owned all financial institutions. As a result, there was virtually lack of competition in the banking sector culminating in banking inefficiencies.

Table 3.1 Summary of banks established during the pre-reform period

Name of Bank	Year Established	Type of Bank
Standard Chartered Bank	1896	Commercial
Barclays Bank	1917	Commercial
Ghana Commercial Bank	1953	Commercial
National Investment Bank	1963	Development
Agricultural Development Bank	1965	Development
Bank for Housing and Construction	1973	Development
Merchant Bank	1972	Merchant
Ghana Cooperative Society	1975	Commercial
Social security Bank	1977	Commercial
National Savings and Credit Bank	1975	Commercial
Bank for Credit and Commerce	1978	Merchant

Source: Bank of Ghana annual reports, various issues

2.1.3 FINANCIAL SECTOR REFORMS

In 1983, Ghana adopted a World Bank sponsored Economic Recovery Programme (ERP) to achieve macroeconomic stability. The ERP involves the devaluation of the Ghanaian currency, dismantling of most price and distribution controls, elimination of many subsidies, broadening of the tax base, and improvement of tax collection. Within the broader context of the ERPs, the financial sector adjustment programme (FINSAP) was launched in September 1987 to liberalize the financial sector. The reforms were carried out in two phases, FINSAP I which covered the period 1988-1991 and FINSAP II which begun from 1992 to 1995.

2.1.3.1 Financial Sector Adjustment Programme (FINSAP I: 1988-1991)

With the provision of US\$100 million financial support by the World Bank under the financial sector adjustment credit (FINSAC) facility, FINSAP I began in 1988 and seeks among other things to achieve the following objectives:

- ❖ restructuring of financially distressed banks;
- ❖ strengthening of the regulatory and supervisory framework of the central bank;
- ❖ recovery of non-performing assets

First, the restructuring of the public sector banks began in 1989, and involved balance sheet restructuring and reforms to their management and operating procedures. A study conducted on the banks with support from the International Development Association (IDA) identified seven banks to be financially distressed. With the appropriate legal framework in place, a number of policies were undertaken to restructure the banks. This includes reconstitution and strengthening of board of directors of affected banks, staff retrenchment aimed at reducing operating costs and cleansing of the balance sheet of the banks. Other measures undertaken include upgrading of managerial capacity and efficiency of distressed banks, staff training of affected banks to improve their skills and providing enough capital and adequate liquidity to enable the distressed banks to operate in a manner that is self sustaining.

Second, in an effort to strengthen the regulatory and supervisory framework of the Central bank, a new banking act was enacted in 1989 which enables the introduction of standardized reporting and accounting procedures, and the strengthening of supervisory capacity of the Bank of Ghana. A minimum paid up capital requirements of 200 million cedis was imposed on Ghanaian owned commercial banks and 500 million cedis on foreign commercial banks

with less than 60% of Ghanaian ownership. An amount of 1 billion was imposed on development banks which provide medium and long term finance for trade and industry. The banking law also sets a minimum capital adequacy ratio of 6% of adjusted risk assets and requires banks to maintain reserve funds with transfers out of annual profits. Finally the law gave the Bank of Ghana the mandate to effectively regulate the banking sector and to take remedial action against banks which are unable to meet their obligations to depositors, or not acting in the best interest of creditors and shareholders.

Third, efforts were made to cleanse the balance sheets of financially distressed banks for restructuring purposes. This was implemented by offloading non-performing loans to state-owned enterprises, government guaranteed loans and non-performing private sector loans into a newly created and wholly government-owned agency, the non-performing assets recovery trust (NPART). The mandate of NPART was to realize proceeds from such assets to the extent possible. In return, the distressed banks were issued interest-bearing FINSAP bonds which were to be redeemed in annual installments. Of the total amount transferred to NPART in 1991 three government-owned banks alone, Ghana Commercial Bank (GCB), Bank for Housing and Construction (BHC) and the Social Security Bank accounted for approximately 75% of the total non-performing assets (See Brownbridge and Gockel, 1996, p.9; Ziorklui et al., 2001, p.15).

The main reason for the losses incurred by the public sector banks was that they had been coerced into extending credit to unprofitable projects to meet developmental and political objectives. Additionally, the power of government to appoint and dismiss the executives and

managers of these public sector banks made them vulnerable to political pressure (Brownbridge and Gockel, 1996). Besides, the economic crisis and the radical changes in economic policy implemented during the 1980s also contributed to the deterioration in the banks' asset portfolios. By 1991, NPART received GH¢ 5.04 million of non performing assets and had recovered GH¢ 1.41 million by the end of 1994 (NPART, 1994, p6; Zoirklui et al., 2001).

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2.1.3.2 Financial Sector Adjustment Programme (FINSAP II: 1992-1995)

With an effort to consolidate the gains made under FINSAP I, FINSAP II was launched with the following objectives.

- ❖ Reduce state shareholding in Ghanaian banks;
- ❖ Continue the bank restructuring programme which was launched under FINSAP I;
- ❖ Intensify the recovery of non-performing loans by NPART;
- ❖ Enhance the effectiveness of the non-bank financial institutions.

In line with the above objectives, interest rates were deregulated and credit ceilings lifted to allow the banks to determine their own rates. To further strengthen the internal management and operational system of the banks the Banking Supervision Department of the Bank of Ghana was strengthened and the National Banking College was established in 1995 to offer training programmes to middle and senior managers in the banking industry.

The Nonbank Financial Law 1993 (PNDCL 328) was passed to regulate the activities of financial institutions such as discount houses, building societies, leasing and hire-purchase

companies, venture capital companies among others. To regulate and maintain surveillance over the securities industry, the Securities industry law of 1993, (PNDCL 333) was enacted.

The government embarked on a policy of privatizing state-owned banks with the aim of reducing the state's direct involvement in the banking system as stipulated in the policy document. Public sector financial institutions were also encouraged to list on the Ghana Stock Exchange as a means of mobilizing the needed long term capital and to reduce their dependence on government for funding.

2.1.3.3 The Outcome of the Financial Sector Adjustment Programme

The financial sector liberalization programme embarked on since the late 1980s has impacted positively on the banking system of Ghana. The liberalization which entailed the removal of interest rate controls and the introduction of market-based instruments of monetary control, led to improvement in deposit mobilization, enhanced efficiency of loan allocation, increase in competition and improved financial services. First, interest rate liberalization involved the removal of maximum lending rates and minimum time deposit rates. By the early 1990s commercial banks were free to price deposits and loans and to allocate loans according to market criteria. The realization of realistic interest rates has attracted new entrants into the market. For instance two merchant banks, Continental Acceptances (CAL) bank and Ecobank began operations in 1990. Meridian Bank BIAO a foreign commercial bank was set up in 1992 with a minority shareholding by SSNIT. In 1995 First Atlantic Merchant Bank and Metropolitan and Allied Bank commenced operation in Ghana. Three other commercial

banks, The Trust Bank, Prudential Bank and International Commercial Bank were also established in 1996.

In addition to the new entrants into the banking industry, there was a significant increase in the number of nonbank financial institutions. During the 1990s, about 20 NBFIs including, discount houses, finance houses, building societies, venture capital companies and savings and loan companies have been established. The NBFIs injected more competition into the banking sector as many of them accept deposits and extend credit, virtually performing the roles by the commercial banks.

Second, there was a moderate improvement in deposit mobilization. For instance bank deposits increased from 10.4% of GDP in 1986 to 12.8% of GDP in 1994 (Brownbridge and Gockel, 1996, p. 18). Even though the liberalization has resulted in high nominal interest rates, the achievement of positive real interest rates became an illusion due to the high inflation rates experienced during the period. Third, the adoption of a more commercially oriented approach to lending by the public sector banks enhanced the efficiency of credit allocation. Directed credit policies were abolished making the banks to finance projects that are capable of generating higher rates of return leading to improvement in the quantity and quality of investments. Besides, there was a significant reduction in the level of the bank's non-performing assets (NPAs) as the banks strive to avoid the financing of unprofitable investments.

Finally, the financial sector reforms had stimulated greater competition in the banking industry in Ghana. The increased competition can be analyzed through several channels. New entry has brought about a reduction in market concentration in the banking industry. Research has shown that, the higher the concentration of the banks the lesser the competition. The share of the four largest banks in total bank deposits fell from 76% in 1988 to 70% in 1994 (See Brownbridge and Gockel, 1996). Besides, in a recent study to explain interest rates spreads in Ghana, Aboagye et al. (2008) found that the market share of the six biggest banks have been falling but still remain substantial. The total asset of the six biggest banks as a percentage of total bank assets fell from 83% in 1999 to 65% in 2006.

Other reasons for the increased banking competition include the diversification of development financial institutions (DFIs) away from the purely specialized functions, the relaxation of interest rate controls and credit ceilings which made banks to compete for customers.

In addition to the above benefits of financial liberalization, the financial sector has also witnessed the establishment of a stock exchange, the Ghana Stock Exchange (GSE), which is considered as the missing link in Ghana's financial development. The Ghana Commercial Bank, the largest of the state-owned banks was listed on the Ghana Stock Exchange in May 1996. Prior to that, another state owned bank, National Savings and Credit Bank merged with the Social Security Bank and was listed on the GSE in October 1995. The GSE facilitated the transfer of funds from surplus agents to sectors of the economy with financial deficit thereby enhancing the efficient allocation of capital.

2.1.4 THE POST ADJUSTMENT PERIOD (1997- Present)

The structural adjustment programme implemented by the government in 1980s succeeded in arresting the economic decline experienced by the country in the 1970s. From the mid-1980s positive economic growth was restored with an average annual GDP growth of 5% and 1-2% average annual per capita income growth. In the banking sector, the quest to achieve a sound and efficient financial system continued with the streamlining of policy measures adopted under FINSAP. The Bank of Ghana continues to adopt monetary and financial policies aimed at reducing inflation and to contain the volatility in the exchange rate so as to provide the enabling macroeconomic environment for economic growth. Efforts were made to implement the policies under the Nonbank financial institutions (NBFIs) law and the Financial Sector Strategic Plan (FINSSP) in 2003. The FINSSP seeks among other things to create a financial sector that is efficient in the mobilization and allocation of funds, fully integrated with the global financial system and supported by an effective regulatory system that promotes a high degree of confidence.

Admittedly, though the financial sector reforms has helped in improving the financial system, as at the year 2000, a number of constraints still remain in the financial sector. There was high interest rates spread, low financial intermediation, the absence of credit information systems, weak regulatory bodies among others. FINSSP therefore aimed at consolidating the gains made under FINSAP and to propel the financial sector into the second stage of development. The FINSSP was implemented under three main phases; The first phase spans the period 2004-2005 and was expected to streamline and strengthen the regulated

framework, upgrade the skills of local professionals in the financial sector and deepen financial intermediation. The second phase which covers the period 2006-2007 aimed at promoting the financial sector to be at par with international standards through greater liberalization. Under the third phase which began in 2008, the reforms were directed to enhance regional and international profile of Ghana as a regional centre by strengthened market regulatory framework and market infrastructure.

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The reforms implemented in the financial sector since the late 1980s have greatly improved Ghana's financial system. As at the end of 2008, total number of major banks stood at 25, made up of 24 class 1 banks and 1 general bank. The summary of the banks established during and after the financial sector reforms era is presented in table 3.2a.

Table 2.2a. Summary of Banks Established for the period 1990-2006

Name of Bank	Year Established	Type of Bank
CAL Bank	1990	Merchant
Ecobank	1990	Merchant
First Atlantic Merchant Bank	1995	Merchant
Metropolitan & Allied Bank	1995	Commercial
The Trust Bank	1996	Commercial
Prudential Bank	1996	Commercial
International Commercial Bank	1996	Commercial
Stanbic Bank	1999	Commercial
Amalgamated Bank	1999	Merchant
UniBank	1999	Commercial
HFC Bank	2003	Commercial
United Bank for Africa	2004	Commercial
Zenith Bank	2005	Commercial
Intercontinental Bank	2006	Commercial
Guaranty Trust Bank	2006	Commercial
Fidelity Bank	2006	Commercial

Source: Bank of Ghana annual reports, various Issues

There were forty-five (45) nonbank financial institutions in operation, comprising finance companies, savings and loans companies, leasing companies, mortgage finance company, and discount house which were granted provisional approval to change its status to a finance house (See table 3.2b).

In the rural banking sector, the ARB Apex Bank is the body mandated by the Bank of Ghana to regulate the sector. ARB Apex Bank continued to pursue its objective of providing banking and non-banking support to the rural and community banks (RCBs). The total number of rural and community banks in operation stood at one hundred and twenty-nine (134) at the end of the 2009.

Table 2.2b Structure of Non-Bank Financial Institutions as at 2009

Type of Institution	Number of Firms
Finance Companies	23
Savings and loan Companies	17
Leasing Companies	5
Mortgage Finance Company	1
Discount House	1
Total	47

Source: Bank of Ghana annual report, 2009.

In an effort to provide credible information on prospective borrowers and reduce the information asymmetry problem which characterized the banking sector, the first ever credit reference bureau in Ghana, XDS Data Limited, was issued with a provisional license under the Credit Reporting Act (Act 726) to commence operations. To further enhance the environment for effective financial intermediation, the Bank of Ghana actively supported the

passage of three new Laws, namely, the Borrowers and Lenders Act, Non-bank Financial Institutions Act and the Home Mortgage Finance Act.

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CHAPTER THREE

REVIEW OF RELEVANT LITERATURE

3.0 Introduction

This section explores the literature on interest rate and the demand for credit. First, the chapter explores the theoretical paradigms of financial market liberalization with a focus on the Mckinnon-Shaw (1973) model; and Stiglitz and Weiss (1981) credit rationing theory. Second, the empirical literature on the above mentioned issues are explored. The literature review will serve as the basis for which the methodology of the study will be formulated and also provide the framework for the analysis of results.

3.1 The Theoretical paradigms of Financial Market Liberalization

The financial repression hypothesis by McKinnon (1973) and Shaw (1973); and the Stiglitz and weiss (1981) credit rationing theory are the two main theories that explain the malfunctioning of financial markets in developing countries.

The McKinnon-Shaw financial repression hypothesis asserts that policies that lead to artificially low interest rates, directed credit programs and high reserve requirements often results in financial market distortions, culminating in the decline in savings and resource misallocation. Hence, government policies that place ceilings on deposit and lending rates stimulate demand for credit while discouraging the supply of credit. In such a situation, the high demand for credit often leads to the adoption of non-price strategies such as rationing through other means other than the interest rate. Friends and cronies who have connection

with bankers are therefore given preferential treatment in terms of loan allocation. This practice results in fragmented financial market and the crowding out of SMEs from the formal financial sector. Unable to secure loans from the formal financial sector, SMEs have to resort to the informal financial sector to meet their financial needs. However, the high interest rates charged by the informal financial sector serves as a constraint to the amount of funds that can be borrowed.

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In order to improve access to finance by businesses, the McKinnon (1973) and Shaw(1973) model advocated for the abolishment of repressive financial policies and the adoption of financial deregulation policies such as the removal of ceilings on deposit and lending rates, adoption of a flexible exchange rate regime, abandonment of directed credit policies among others.

The “Financial liberalization view” enumerated by McKinnon-Shaw is that allowing deposit and lending rates to be determined by the forces of demand and supply would provide incentive for both savers and investors. Savers will be motivated to save more due to the expected increase in the real interest rate while investors will also invest in high yielding projects which have the potential of promoting growth. The increase in the real interest rate also serves as a disincentive for low yielding investments, thereby increasing the average efficiency of investment. Further, increases in output growth rate are expected to increase the savings rate. Thus, the pursuit of financial market liberalization policies is essential for efficient functioning of financial markets; a condition which would lead to improved access to finance by all businesses including SMEs.

The Stiglitz and Weiss (1981) credit rationing theory provides another framework for analyzing financial market inefficiencies. According to the credit rationing theory, information asymmetry is regarded as the main cause of financial market malfunctioning in developing countries. Banks that advance loans are primarily concerned about the interest rate they receive on the loan and the riskiness of the loan. However, the interest rate a bank charges on loans have the tendency of affecting the riskiness of a pool of loans by either sorting potential borrowers – adverse selection effect; or affecting the behaviour of borrowers – moral hazards (Stiglitz and Weiss, 1981, p.393). Thus asymmetrical information problem in credit markets takes two main form; adverse selection and moral hazards.

Adverse selection problem arises due to the fact that different borrowers have different probabilities of loan repayment. The expected return to the banks is also dependent on the probability of loan repayment. Due to this, the bank will have to distinguish “good borrowers” from the bad ones using a variety of screening devices. The interest rate an individual is willing to pay is considered as one of the screening devices to identify potential borrowers with a high probability of repayment. According to Stiglitz and Weiss (1981), individuals who are willing to pay high interest rates on the average, are worse defaulters; they are willing to borrow at high interest rates because they perceive their probability of repaying the loan to be low. Thus, increases in the rate of interest raises the riskiness of borrowers and affects the bank’s profit negatively.

Besides, at high rates of interest, less risky projects may become unprofitable and pose a threat to loan repayment. Due to the high interest rates, borrowers with high yielding risky

projects are favoured and the associated high probability of default consequently threatens the capital base of the banks. Therefore in order to minimize risk, banks tend to give out loans at a relatively lower rate than at market rates. This realignment of loan portfolios therefore implies that the interest rate mechanism will be unable to achieve market rate equilibrium and credit rationing may be used to allocated funds.

Another way in which the interest rate affects the banks expected return from a loan is by changing the behavior of borrowers. Moral hazards problem arises mainly because it is prohibitively expensive for the banks to effectively monitor the behaviour of borrowers after loans have been advanced to them. Therefore, the banks have to take into account the effect of interest rate on the behaviour of borrowers. However, increasing the rate of interest raises the relative attractiveness of riskier projects inducing firms to divert approved funds to finance only high yielding projects. The high risk associated with these high yielding projects would intend affect the probability of loan repayment and consequently reduce the profitability of banks. Thus, the moral hazard phenomenon may compel lenders to ration credit rather than raise the interest rate when there is an excess demand for loanable funds.

3.2 The Theory of Interest rates

From the lenders perspective, the interest rate is considered as the premium paid to savers for making surplus funds available to financial intermediaries. From the borrower's point of view, the interest rate is the user cost of capital incurred by using funds for investment. There are numerous school of thought regarding interest rates in literature. The classical school regarded the rate of interest as the factor which brings the demand for investment and the

willingness to save into equilibrium with one another. Here, investment represents the demand for investable resources and saving represents the supply, whilst the rate of interest is the “price” of investable resources at which the two are equated (Keynes, 1936).

Thus, in the classical system, savings and investment is a function of the interest rate. The higher the rate of interest, the more savers will be willing to replace present consumption with future consumption, thereby increasing the level of savings. Hence the classical economists viewed the interest rate as a real reward for abstinence or thrift (Snowdon and Vane, 2005, p. 47). The flow of saving therefore represents a supply of loanable funds in the capital market. On the other hand, investment expenditure on capital goods is negatively related to the rate of interest in the classical model and represents a demand for loanable funds in the capital market.

The classical theory of interest rate has triggered a number of criticism especially from Keynes. One major criticism of the classical theory is the neglect of the influence of changes in the level of income on the marginal propensity to save. Keynes argued that “if the level of income is assumed to be given, we can infer that the current rate of interest must lie at the point where the demand curve for capital corresponding to different rates of interest cuts the curve of the amounts saved out of the given income corresponding to different rates of interest”(Keynes, 1936, p.). In this case the level of income must be the factor that would equate savings with investment. Another setback of the classical theory is that the assertion that savings must necessarily equate the level of investments may not always be true since investment is also determined by other such as business expectations, the level of income etc.

For instance, investment decisions could be influenced by tides of irrational optimism and pessimism, causing large swings in the state of business confidence, which brings into question the efficacy of interest rate adjustments as a way of influencing the volume of investment.

In his book “*The General Theory of Employment, Interest and Money*” Keynes (1936) rejected the idea that the interest rate was determined by the real forces of thrift and the marginal productivity of capital. In the *General Theory* the interest rate is a purely monetary phenomenon determined by the liquidity preference (demand for money) of the public in conjunction with the supply of money which is exogenously determined. Like the classical, Keynes agree that people demand for money to undertake day-to-day transactions, but asserts that economic agents may also hold real money balances to cushion against unforeseen contingencies. Keynes major departure from the classical school of thought is the introduction of the liquidity preference theory which is sensitive to the rate of interest. Keynes rejected the classical notion that interest was the reward for postponed current consumption. For him the rate of interest is the reward for parting with liquidity or not hoarding for a specified period. In a world characterized by uncertainty there will always be a speculative motive to hold cash in preference to other financial assets (such as bonds), and in Keynes’s view ‘liquidity preference’ will always exert a more powerful influence on the rate of interest than saving decisions (Snowdon and Vane, 2005).

Thus, by introducing the speculative motive into the money demand function, Keynes made the rate of interest dependent on the state of confidence as well as the money supply.

The modern view of interest rate based on imperfect information was propounded by Hoff and Stiglitz (1990). By augmenting the classical theory of interest rates and introducing imperfection information, they asserted that interest rate may not equilibrate credit supply and demand due to the existence of credit rationing brought about by asymmetry information. The classical view of interest rate states that if there is excess demand for loans at a given interest rate, the price will rise to choke off the excess demand. Higher interest rates would raise the lender's return if they did not increase his risk by increasing the probability of default. But at some higher rate of interest, the greater risk and thus the higher probability of default will offset the increased interest income of the loan portfolio. In order to minimize risk and achieve a favourable risk composition of projects, the lender has to lower interest rates and adopt other non-price means of rationing the available loanable funds. Thus, contrary to the classical notion that excess demand for credit necessitates a rise in interest rate to achieve equilibrium, there interest rate may remain unchanged even in the face of excess demand in markets with imperfect information. In cases where lenders did not recognize the effect of interest rates on the risk of their loan portfolio, the impact on returns may even be worse. That is, a situation may arise where at a given interest rate, the default rate may be too high that return to lenders will not be enough to cover the opportunity cost of funds. This would put upward pressure on interest rates, a situation which would further exacerbate the risk mix. This process would continue until the interest rate becomes so high that only riskiest projects – those with the highest probability of default – would be undertaken. The implication of the credit rationing theory by Hoff and Stiglitz (1990) is that

3.3 The Demand for Credit

The role of credit in a society is to bridge the gap between financial requirements of businesses and the financial assets of businesses. It can also be seen as an important instrument for improving the welfare of the poor directly (consumption smoothing that reduces their vulnerability to short term income shocks) (Binswanger and Khandker 1995; Heidhues 1995; Nwanna 1995) and for enhancing productive capacity through financing investment by the poor in their human and physical capital. According to Aryeetey et. al. (1994), demand for credit can be categorized into three, namely; perceived demand for credit, potential demand for credit and revealed demand for credit. Perceived demand for credit is represented by a situation where enterprises that assume to be in need of cash, mention finance as the constraint. Potential demand is characterized by a desire for credit which is not actualized due to market imperfections and institutional barriers. Revealed demand is characterized as written application for financial support at a given rate of interest.

The theories of the demand for assets such as the transaction, precautionary, and portfolio model may be applied to model the demand for credit to the private sector. At the theoretical level, most studies of demand for credit include an economic activity variable such as real GDP or industrial production, financing cost (bank lending rates) and expected inflation.

There is some disagreement in literature with regards to how economic activity affects credit demand (Calza, Gartner and Souza, 2001). A number of empirical findings confirm a positive relationship between economic activity and demand for credit based on the theoretical underpinning that strong economic growth would have a positive effect on expected income

and profits and, thus, on the overall financial conditions of households and corporations. Kashyap et al. (1993), argue that economic growth provides an opportunity to private sector agents to support higher levels of indebtedness and consequently, to finance higher consumption and investments through credit. Thus, in periods of boom, with businesses keen to expand output and consumers keen to spend in anticipation of rising incomes, this situation is likely to culminate in high demand for bank loans. Besides, expectations of higher activity and productivity can lead to a larger number of projects becoming profitable in terms of expected net present value and, hence, to a higher demand for credit to fund them.

By contrast, some empirical studies conducted on the US do not support the existence of a stable relationship between credit and some activity. Some writers even argue that the relationship between the two variables may be negative if it existed (Bernanke and Gertler, 1995; Friedman and Kuttner, 1993). These writers argue that an increase in contemporary productivity leads to a rise in output and ultimately profits. Based on this argument, during boom periods, companies might prefer internal financing by ploughing back of profits and reduce the relative proportion of external financing. This argument is supported by the pecking order theory which states that profitable firms which generates cash internally may have less need for external financing (Ross 2003, p.440).

On the other hand, in recessions, when both disposable income of households and the profitability of firms are likely to decline, households and corporations may increase their demand for bank credit in order to smooth out the impact of lower income and profits (Calza

et al., 2001). Thus, the relationship between demand for credit and economic activity is an empirical question.

The cost of loans which is represented by bank lending interest rates is another variable that influences the demand for credit. Although, there is consensus on the use of bank lending rates as an argument in the demand for credit model, some studies argue that the cost of loans should be adjusted to reflect the opportunity cost of bank loans. For instance, Friedman and Kuttner, (1993) asserted that the demand for loans will depend not only on the own price of the borrowed funds, but also the price of funds obtained from other internal or external sources. There is however a divide on the relationship between the cost of loan (interest rate) and demand for credit. Whiles some argue that the relationship is negative, (Weiss, 1981: Stiglitz, 1989: and Besley, 1994) others consider it to be neutral. Those who argue for the negative relationship between demand for credit and the interest rate advocate that high interest negatively affect demand for credit because only limited borrowers with high risk projects may have their demand satisfied. Prominent among those who hold this view are Stiglitz and Weiss (1981), Stiglitz (1989) and Besley (1994). Their argument is based on the fact that high interest rates encourage adverse selection of loan seekers. Those who take high risk and get their loans approved are those with high default rates. Nehman (1973) in his work on the analysis of demand for rural credit among farmers in Sao Paolo, Brazil, observed that borrowing costs strongly affect the willingness of the rural poor to seek loans from the formal sector. Although the work by Aryeetey et. al. (1994), on the supply and demand of finance of small enterprises in Ghana, did not make any explicit relationship between the

interest rate and demand for credit, it did acknowledge implicitly that demand for credit at 30% interest rate was somewhat weaker among medium-sized firms.

Inflation expectation of borrowers is another important variable that affects the demand for bank credit. The effect of expected inflation on demand for credit could be positive or negative depending on the basis of argument. If it is expected that increase in the rate of inflation will be greater than the increase in the rate of interest, then the demand for credit would increase by offsetting the effect of increase in nominal interest rate. This implies that the demand for bank credit is directly related to the rate of inflation. Another source by which the impact of inflation on demand for credit can be determined is through the private business sector. If high inflation is associated with the highly variable rate of interest, it may increase the risk associated with the return to investment. This leads to the negative impact of the rate of inflation on the demand for bank lending.

There are some other important factors that affect the demand for credit. These are supply - side factors, such as requirements for collateral or certain procedural specificities, which lead to rationing in the financial market and restrict some people from using one service or the other. Zeller and Sharma (2002) point out that many of the Ghanaian households which do not apply for formal loans are indeed discouraged by such constraints. It must be noted that, although these are important factors, it is difficult capture them in this study due measurement and data constraints.

CHAPTER FOUR

METHODOLOGY

4.0 Introduction

This chapter provides the analytical framework for the study. This will place the study in its right methodical perspective with regards to the necessary tools for estimation and aid the presentation of results and the provision of appropriate policy recommendations in the last two chapters. It begins with a description of the econometric model adopted for the study and the technique to be employed in estimating it. Later, the definitions of the various variables, their significance and their sources will be presented. Finally, concluding remarks will be provided.

4.1 The Econometric Model

4.1.1 The Theoretical Framework

The discussions in chapter two raised three important issues of concern for this study:

- ❖ First, that the demand for credit has varied implications for economic activities (i.e. when economic activities are measured by real GDP).
- ❖ Second, that the demand for credit is influenced mostly by the cost of loan (i.e. when the cost of loan are measured by a bank's lending rate).
- ❖ Third, that inflationary expectation is another important factor that affects the demand for credit.

These concerns suggest one may have to employ a dynamic econometric model that specifies the demand for credit as a function of economic activities, the cost of loans and inflationary

expectations. Verbeek (2004) mentions that using a dynamic econometric model facilitates the investigation of dynamic interactions between variables in a special way that avoids the potential problems of spurious (nonsense) regression – a regression that produces a fairly high coefficient of determination, high auto-correlated residuals and highly significant coefficient estimates.

Following Calza et al. (2001) and Qayyum (2007), the demand for credit in Ghana is modeled as a function of GDP, the lending rate and the expected rate of inflation. This is specified functionally as:

$$DC = f(GDP, LR, \pi^e) \quad (1)$$

Where DC is real Domestic Demand for Credit, GDP is real Gross Domestic Product, LR is the real Lending Interest Rate and π^e is the real expected rate of inflation. Taking the logs (to derive elasticity coefficients that facilitate sensitivity analysis) of both sides of equation (1) linearizes the model into a logarithmic equation as follows:

$$\ln(DC)_t = \alpha_0 + \alpha_1 \ln(GDP)_t + \alpha_2 \ln(LR)_t + \alpha_3 \ln(\pi^e)_t + \varepsilon_t \quad (2)$$

To estimate the above model, the study makes use of the Cointegration Technique due Johansen and Juselius (1990). The technique is essentially a maximum likelihood estimation procedure that allows one to test for the short and long run relationship between economic variables. The starting point of the technique is the generation of a Vector Autoregressive Representation (VAR) of variables under consideration at a particular order and testing a hypothesis about the rank of a generated cointegrating equation. Later a parsimonious

equation (representing the short run relationship of variables under investigation) could be estimated. Although Johansen's methodology is typically used in a setting where all variables in the system are $I(1)$, having stationary variables in the system is theoretically not an issue and Johansen (1995) states that there is little need to pre-test the variables in the system to establish their order of integration. If a single variable is $I(0)$ instead of $I(1)$, this will reveal itself through a cointegrating vector whose space is spanned by the only stationary variable in a model.

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4.2 The Econometric Technique

4.2.1 Stationarity Test

Studies involving time series analysis necessarily employ data from the past to quantify historical relationships, such that if the future happens to be like the past, then the historical relationship can be used to forecast the future. But if the future happens to be essentially different from the past, then those historical relationships may not be reliable in forecasting the future. Hence it is fundamental that time series variables follow at least a stochastic process and are stationary. For the purposes of this study, the Augmented Dickey-fuller (ADF) test will be employed to ascertain if the variables under consideration are stationary or not (have a unit root). Where the variables are found to contain unit roots, the study makes use of the logs followed by the respective number of differences of the variables, until the variable in question becomes stationary.

4.2.2 Testing for Lag Structure

One of the challenges in specifying an optimal lag length (ρ) for a model is that if it's chosen lag length is too small, it is possible the model may be mis-specified due to the omission of relevant variables and if too large, it is possible the number of degrees of freedom may be lost. In other words, a model with relatively large number of lags is most likely to produce residuals that approach the white noise process, but might not be parsimonious. On the other hand, a model with smaller lag lengths is more likely to be parsimonious, but might not produce residuals that are random enough to approach a white noise process. The above problem implies that there is the need to select an optimal lag length ρ . The Schwartz Bayesian information Criteria (SIC) and the Akaike information Criteria (AIC) are identified in literature as appropriate in selecting optimal lag lengths that produces errors that approach a white noise process, subject to the constraint that the smallest number of lag terms will be selected for parsimony. These approaches will jointly be employed to determine the optimal lag length of variables for this study.

4.2.3 Diagnostic Tests

As Kramer et al. (1985) recommended that, conventional regression output needs to be supplemented by a number of specification tests. A series of tests are performed to support this study. These include testing the residuals for normality, homoscedasticity, and autocorrelation. Also, a test was carried out on coefficient in various models for their significance. Lastly, models will be taken through the Ramsey's Reset test, Normality test and Stability tests for parsimony.

4.3 Measurement of Variables and their expected signs

4.3.1 Domestic Demand for Credit (DC)

The domestic demand for credit is measured by the proportion of income allocated to the private sector by Deposit Money Banks (DMBs). This excludes funds issued by the central bank, as well as, funds issued to the public sector (Levine et al., 1999). Its strength as a measure of domestic credit of an economy is its ability to focus exclusively on the private sector; since funds directed to this sector is the most relevant in measuring opportunities to new firms, and also has the ability to scrutinize unviable projects for financing. Further, it is argued that loans to the private sector are given more stringently and that the improved quality of investment emanating from financial intermediaries' evaluation of project viability is more significant for private sector credit.

4.3.2 Real Gross Domestic Product (GDP)

Real *GDP* growth measures the aggregate growth in the economy overtime and captures how best growth in the real sector of the economy can affect the level of financial development. It is expected that real GDP may have a positive impact on Domestic Credit. The justification is drawn from Patricks' supply leading and demand following hypotheses, where there is the proposition that financial development and economic growth are both driving forces of each other.

4.3.3 Real Lending Interest Rate (LR)

The real lending rate is the rate at which financial institutes lend money. It constitutes the base from which banksthenlend money to the final customer. For the purposes of this study,

the policy rate will be used. It is expected that the policy rate will have a negative relationship with the demand for credit.

4.3.4 Real expected rate of inflation (Π^e)

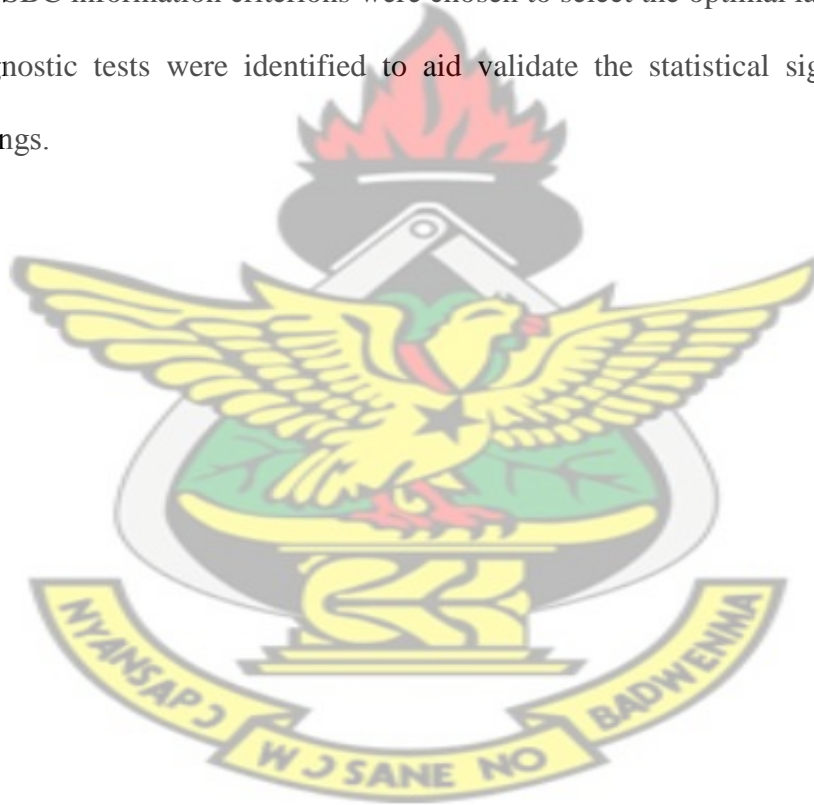
The real expected rate of inflation is measured by the first difference of the log of the consumer price index (CPI). The CPI is chosen since it is the best measure for adjusting payments to consumers when the intent is to allow consumers to purchase, at today's prices, a market basket of goods and services equivalent to the one that they could have purchased in an earlier period. It is also the best measure to use when one wants to translate retail sales and hourly or weekly earnings into real or inflation-free figures. Inflation is expected to have a negative relationship with financial development (and cause or present deleterious effects to financial development), as high inflation rates exacerbate credit market friction, impeding their activities and operations. The expected rate of inflation is expected to have a negative relationship with domestic credit.

4.4 The Data

The study employed annual time series data for Ghana between 1970 and 2007. The datasets were obtained from the Ghana Statistical Service and the World Development Indicators CD Rom (Africa Edition). Data on consumer price index and GDP were obtained from the Ghana Statistical Service; while that on Domestic Credit and the lending rate was obtained from the World Development Indicators CD Rom (Africa Edition).

4.5 Conclusion

As mentioned earlier, available theoretical literature explaining the demand for credit mostly emphasize economic activities, the cost of loans and inflationary expectations. Given the focus of this study, a dynamic econometric model that specifies the demand for credit as a function of the lending rate, real GDP and expected inflation is specified. The Cointegration Technique due Johansen and Juselius (1990) was proposed for estimations. Also, the ADF unit root test were chosen to assess the stationarity of the variables under investigation and the AIC and SBC information criterions were chosen to select the optimal lag length. Finally, various diagnostic tests were identified to aid validate the statistical significance of the study's findings.



CHAPTER FIVE

PRESENTATION AND DISCUSSION OF THE RESULTS

5.0 Introduction

In the preceding chapter, the Johansen cointegration technique was chosen to estimate the impact of interest rates on the demand for credit. The main purpose of this chapter is thus to employ this technique, with the proposed model, to achieve the objectives of this study. This is done in three sections. The first section describes the variables selected for the study. The second presents and discusses results from the estimation process, and the final section provides a summary of the various results and concluding remarks.

5.1 Data Description

The study employed annual time series data for Ghana between 1970 and 2007. For estimation purposes, the variables were transformed into logs and ratios. While the real demand for credit and real GDP were computed by taking the logs of real Commercial bank loans and real GDP respectively, the real lending rate and the expected rate of inflation were computed by taking the first difference of the logs of the average lending rate and consumer prices index respectively. This transformation process is summarized in Table 5.1

Table 5.1: Transformed Time Series Data

Variable	Concept	Description	Units
<i>LRDC</i>	Log of real demand for credit	Commercial bank loans	Millions of Ghana cedis
<i>LGDP</i>	Log of real GDP	Gross Domestic Product 1993=100	Millions of Ghana cedis
<i>RLR</i>	Real Lending rates	Average lending rates	percentages
<i>II^e</i>	Expected inflation	Changes in Consumer price index	Percentage per annum (2000=100)

Source: Author

To ascertain the stationarity status of the variables, the Augmented Dickey Fuller (ADF) test for unit root is applied on the selected variables. The ADF test was complemented by the Phillips Perron (PP) test to ensure the unit root test result was robust. Overall, the unit test is supposed to ensure variables selected for the VAR model are in a non-explosive form and satisfies the necessary assumptions of the VAR model.

Table 5.2: Results for Unit Root

Variables	ADF unit roots test		PP unit roots test	
	Level	First difference	Level	First difference
LRDC	-0.202201	-5.332238*	-0.202201	-5.332238*
LGDP	2.247645	-5.536481*	2.247645	-5.536481*
RLR	-2.591024	-6.734614*	-2.591024	-6.734614*
EXPINFL	-3.540731**	-	-3.540731**	-

Source: Computed from E-Views 5.1.

* and ** indicates significance at 5% and 10% respectively

The ADF test statistics are presented in Table 2; together with the PP test statistics. The test statistics are compared to the critical values from MacKinnon (1996) to conclude on the

stationarity status of the series. As can be learned from table, almost all variables selected for the estimation process were non-stationary on their levels, with the exception of the expected rate of inflation, which happened to be stationary on levels at 10%. This suggests one may have to employ the first difference of all the variables, with the exception of the rate of inflation (must be in level form) for the estimation process.

To complement the above test, a correlation matrix (see Table 3) is computed to test the degree of association between the independent variables. The matrix suggests a relatively strong positive correlation between the real lending rate and real GDP. Also, there is a fairly weak negative correlation between real GDP and the expected rate of inflation, but a moderate negative correlation between the expected rate of inflation and the real lending rate. These evidences suggest one may have to employ some corrective measures to avoid potential multicollinearity between the independent variables.

Table 5.3 Correlation Matrix of the Independent Variables

Variable	<i>LGDP</i>	<i>RLR</i>	<i>EXPINFL</i>
<i>LGDP</i>	1.000000	0.576249	-0.293238
<i>RLR</i>		1.000000	-0.469804
π^e			1.000000

Source: Computed from E-Views 5.1.

Table 5.4 contains some summary statistics for the variables selected. For the entire duration selected, the average expected rate of inflation was around 32% with a negative real lending rate (-2.99). Also, real domestic credit and real GDP both had relatively lower means. While real domestic credit and real GDP were observed to be normally distributed (from the values of the kurtosis and skewness), the real lending rate and the expected rate of inflation was

observed to be non-normal. Lastly, real domestic credit and real GDP showed little variations as compared to the real lending rate and the expected rate of inflation. All these statistics can be observed from Table 5.4.

Table 5.4: Summary Statistics for Variables

	LRDC	LGDP	RLR	EXPINFL
Mean	0.255437	5.889827	-2.988378	32.42784
Std. Dev.	1.075637	0.345946	33.46522	28.20844
Skewness	0.047797	0.592520	-1.430723	1.596041
Kurtosis,	2.486009	2.026957	4.267166	4.511828
Jarque-Bera	0.432765	3.624661	15.09843	19.23232
Probability	0.805427	0.163273	0.000527	0.000067
Sum	9.706614	217.9236	-110.5700	1199.830
Sum Sq. Dev.	42.80882	4.308434	40317.16	28645.77

Source: Estimated from E-Views 5.1.

5.2 Cointegration Test Result

For a lag length of 1 (selected by AIC), there was an evidence of one cointegrating relationship between interest rates and the real demand for credit; with real GDP, and the expected rate of inflation serving as control variables. This suggests interest rates and the real demand for credit have a long memory in Ghana. Both the trace and the maximum eigenvalue tests selected one cointegrating relation each (See Table 5.5). Estimations are, thus, done with an error correction term in mind and distinguishing the long run link between interest rate and the real demand for credit from the parsimonious short run link.

Table 5.5: Johansen Multivariate Cointegration Test Results

Trace Test			Maximum Eigenvalue Test		
Null Hypothesis	Test Statistics	Critical value	Null hypothesis	Test statistics	Critical value
$r = 0$	51.47813	47.85613**	$r = 0$	29.53962	27.58434**
$r \leq 1$	21.93851	29.79707	$r \leq 1$	13.14473	21.13162
$r \leq 2$	8.793784	15.49471	$r \leq 2$	6.648150	14.26460
$r \leq 3$	2.145633	3.841466	$r \leq 3$	2.145633	3.841466

Source: Computed from Eviews 5.1

**** denotes rejection of the null hypothesis at 5% level of significance. Decision is based on MacKinnon-Haug-Michelis (1999) p-values.**

The long run relationship between the real demand for credit and the lending rate, real GDP, and the expected rate of inflation, after normalizing on the initial variable, can be observed in Table 5.6. The results suggest a negative relationship between the real demand for credit and the lending rate. This relationship was also established to be statistically significant at 5%. In a different spectrum, a statistically significant negative relationship was observed between the real domestic credit and the expected rate of inflation, but a positive relationship with real GDP. These signs correctly match the a priori expectations for the study. One explanation that stands out clear for the negative relationship between the real lending rate and the real demand for credit is that of the lack of an alternative borrowing scheme for economic agents. These economic agents are thus forced to cut down their demand for credit from the same old financial institutions for a rise in the real lending rate. Alternatively, if the real lending rate falls, the real demand for credit increases. This is then translated into increased investments and thus real GDP, thereby explaining the positive link between real domestic credit and real GDP. As for the expected rate of inflation and its negative impact on real domestic credit, the explanation by Stiglitz holds. To Stiglitz, a rise or fall in the expected rate of inflation

intensifies the adverse selection and moral hazard problems of financial institutions, leading to the real lending rate being used as a screening device between potential borrowers.

Table 5.6: The Long Run Relationship

LRDC	LGDP	RLR	EXPINFL
-1.000	4.023995**	-0.026117**	-0.047208**
	[7.44445]	[-2.10161]	[-3.73156]

Source: E-Views 5.1.

**** denotes 5% significance level (t statistics in parenthesis)**

The coefficient of the error correction term (ECM) indicates that approximately 35% of the discrepancy between the short and the long run is corrected each quarter. In the short run however, a positive relationship was observed between the real lending rate and real domestic credit. Aside that, no deductive statistical inference could be made for the other variables.

Table 5.7: The Parsimonious Short Run Relationship

CointEq1	DLRDC	DLGDP	DRLR	DEXPINFL	C
-0.3516	0.0147	0.5094	0.0137	0.0019	0.0242
[-5.3094]	[0.1197]	[0.6048]	[6.0777]	[1.3679]	[0.6512]

Source: E-Views 5.1.

Dependent Variable: DLRDC

**** denotes 5% significance level (t statistics in parenthesis)**

The positive short run relationship between the real lending rate and the real demand for credit seems to support the theories of McKinnon and Shaw. Thus, while it appears the impact of interest rates on the demand for credit in the short run follows the credit rationing theory, the long run link is well explained by the theories of McKinnon and Shaw. The main conclusion from this study is that while increases in the real lending rate may not

immediately hamper the demand for credit due to the limited time available for borrowers to adjust, it may eventually lead to a fall in the demand for credit in the long run. Lastly, a diagnostic test results performed establish the results are robust.

5.3 Conclusion

This chapter described the variables selected for the study and also discussed results from the estimation process. At the end, a negative relationship was established between interest rates and the real demand for credit in the long run; with a positive link existing in the short run. This evidence suggests while increases in the real lending rate may not immediately hamper the demand for credit due to the limited time available for borrowers to adjust, it may eventually lead to a fall in the demand for credit in the long run.



CHAPTER SIX

SUMMARY AND RECOMMENDATIONS

6.0 Introduction

This chapter provides a general summary and conclusion for the study, as well as recommendations for policy analysis and further studies. At the end of the chapter, limitations of this study are provided.

6.1 Summary and Conclusion of the Study

The study examined the impact of interest rates on the demand for credit between 1970 and 2007 in Ghana. This was in line with theoretical inconsistencies as to whether effective financial intermediation could be undertaken at relatively high or low interest rates. Though these propositions are supported by a number of empirical evidences and sounds great, the evidence in Ghana appears mixed. While developments in the financial sector of Ghana in the 1980's suggested high interest rates were repressive to the financial sector (thus disrupting effective financial intermediation), recent developments (2000's) still suggest interest rates are too high for effective financial intermediation, though the rates appear to be relatively lower than they were some two decades ago. So what is the impact of interest rates on the demand for credit in Ghana? This study attempted to answer this question.

To accomplish this, a vector autoregressive model is developed and estimated. Diagnostic tests were also carried out to ensure all models satisfy the assumptions of the estimation techniques selected. The results indicate interest rates have a positive impact on domestic

credit in the short run and a negative relationship in the long run. While increases in the real lending rate may not immediately hamper the demand for credit, it may eventually lead to a fall in the demand for credit in the long run.

In that direction, if market forces tend to put an upward pressure on prices, then authorities could take advantage of that and make more credit available.

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6.2 Recommendations for Policy Analysis and Further Studies

Based on the study's conclusions, the following policy recommendations are suggested. Accompanying these recommendations are proposed areas for further studies.

First, monetary authorities should allow interest rates to be determined by the forces of demand and supply and rather respond by defining their objectives with the notion that an upward surge in the lending rate immediately deters the demand for credit but in the long run promotes the demand for credit.

Secondly, if authorities want to reverse the positive short run or negative long run link between the real lending rate and the demand for credit, emphasis should be placed on price stability. This is critical, as it will reverse the adverse selection and moral hazard problem of banks and also countervailing the credit rationing theory and that of the McKinnon and Shaw models.

Finally, another useful exercise would be to examine the impact of interest rates on loan repayment in Ghana.

6.3 Limitations of the Study

Two important limitations were identified to have confronted this study. First, econometric techniques, most often, used in analyzing level relationships between two or more variables may have some inherent limitations for policy recommendations. The reason being that the results from these techniques may not be equivalent to the many philosophical notions of level relationships; implying, their interpretations may also be misleading. Again, even if the results are consistent with philosophical notions, the fact that different econometric software (though may provide similar results for each of these techniques) report different critical values depending on the sample size being used may lead to the acceptance of a null hypothesis, even if they are untrue.

Second, deflating nominal values by the conventional method of dividing such values by CPI to obtain real values are inconsistent with the concept of stocks and flows. Though, authors such as King and Levine (1993a) attempted to solve this problem by taking the average of the balance sheet items in year t and $t-1$, Calderon and Liu (2002) mentions that this may not fully resolve the distortion caused by high Inflationary environments. Beck et al (2000) went further to provide a better way of deflating such nominal figures by using the end of year CPI on each end of year balance sheet items. However, recent evidence indicates this may not be a particularly good average for the entire year.

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