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Determinants of Interest Rate Spread in Ghana

By

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DECLARATION

Candidate's Declaration

I hereby declare that this submission is my own work towards the degree of Master of Science (Economics) and that, to the best of my knowledge; it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where acknowledgement has been made in the text.

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Supervisor's Declaration

I hereby declare that the preparation and presentation of this thesis was supervised by me in accordance with the guidelines on supervision of thesis laid down by the university.

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ABSTRACT

The study investigated the banking industry and macroeconomic determinants of interest rate spread in Ghana in an ARDL framework. The study revealed that in the long run, Treasury bill rate and the total deposit mobilized by the banks have a significant negative effect on the interest rate spread, while exchange rate has a significant positive effect on the interest rate spread. In the short run, real GDP, treasury bill rate, total deposit mobilized by the banks and exchange rate have a negative effect on interest rate spread while inflation has a positive effect on interest rate spread.

The study has demonstrated the importance of macroeconomic stability in reducing the spread in interest rate in Ghana. Specifically, inflation, exchange rate, Treasury bill rate and real GDP have important implications on the spread in interest rate in Ghana.

It is therefore imperative for policy formulation to keep inflation rate as low as possible through the implementation of appropriate monetary and fiscal policies.

Actionable steps should be taken to work at stabilizing the depreciation of the cedi against the dollar through increased exports and less imports by enhancing the activities of the Ghana Export promotion Council. Also, the Government should search for alternative ways of generating revenues rather than borrowing from the domestic market through treasury bills as this will keep the rate on treasury bills low. Furthermore, steps should be taken to end the power crisis which has crippled economic growth in the country since real GDP was found to negatively influence interest rate spread.

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DEDICATION

This dissertation is dedicated to my wonderful Mum and Dad for having my back.

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CHAPTER ONE

INTRODUCTION

1.1 Background to study

The banking industry in Ghana has changed considerably since 1988 as a result of the gradual and steady implementation of financial services deregulation, globalisation and the emergence of communication and information technologies. As part of the structural economic adjustment and stabilisation programme launched in 1983, the financial deregulation was undertaken with the assistance of the International Monetary Fund (IMF) and World Bank.

The aim of reforming the financial sector was to increase the competitiveness of banks, improve upon the efficiency and performance of the Ghanaian banking system that could contribute in greater measure to stimulate economic growth and ensure financial stability.

The Ghanaian financial sector has been growing rapidly in terms of the number of institutions and products offered. The sector is dominated by formal banks that offer a wide range of products and services. Besides the banks, there are other nonbank financial institutions (NBFIs), including savings and loans companies, insurance companies, and the stock exchange. Financial institutions, in general, help to channel surplus resources from savers to borrowers. Investment of the resources contributes to economic growth.

Financial liberalization is expected to enhance competition and efficiency in the financial sector with the benefit of narrowing the interest rate spread. Quaden (2004), argued that the benefits to the economy of a more efficient banking system is “higher expected returns for savers with a financial surplus, and lower borrowing costs for investing in new projects that need external finance.”(expected benefits of the liberalization financial sector)

Interest rate spreads which is defined as the difference between deposit and lending rates not only indicate the level of inefficiency of the banking sector but shows the level of development of the financial system. According to Bawumia *et al* (2005), interest rate spreads within the Ghanaian banking industry are among the highest in Africa. Ghana's experience with the aim of liberalizing the interest rates through financial sector reforms has rather shown a widening interest rate spread. The period of liberalization has been characterized by high implicit costs with tight monetary policy achieved through increased reserves and cash ratios (Bawumia *et al.*, 2005).

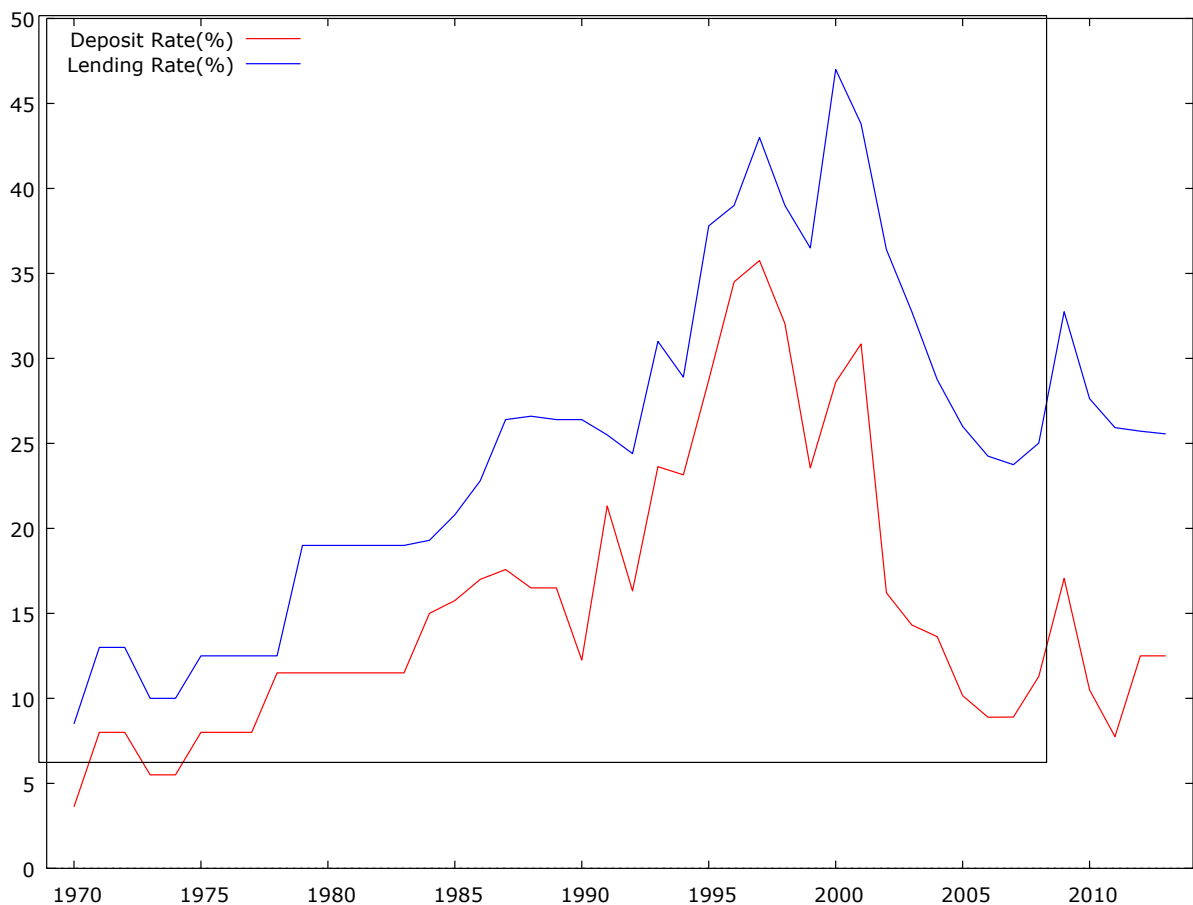


Figure 1: Trend in Interest and Deposit Rate

Figure 1 shows the trend in lending and deposit rates in Ghana. It can be seen that both the deposit and lending interest rates have been on the increase from 1970 till 1997. For example,

in 1970, the average deposit rate was 3.62% while the lending rate was 8.50 % indicating a spread of 4.88%.

In 1997, the average deposit rate was 35.76% while the average lending rate was 43% indicating a spread of 7.84%.

Similarly in 2010, the deposit rate was 10.5% while the lending rate was 27.63% indicating a spread of whopping 17.13%. In 2013 the average deposit rate increased to 12.5% while the average lending rate decreased to 25.56 with a spread of 13.06% but this is significantly high.

This study therefore seeks to determine the determinants of high interest rate spread in Ghana.

1.2 Problem Statement

According to Randall (1998), Gelbard and Leite (1999), and Brock and Rojas-Suarez (2000) interest rate spreads in Sub-Saharan Africa, Latin America and the Caribbean are higher than in OECD economies. In spite of the widespread execution of pricey financial sector reform programs in emerging economies, the financial sector in these countries are still branded by continuously high interest rate spreads. The span between interest rate on borrowing and interest rate on savings in Ghana has been increasing over the years and has put Ghana in the lead of high lending rate in sub-Sahara Africa.

When interest rate spread becomes too high, it negatively affects the operations of financial intermediaries, as it dispirits savers due to low returns on deposits and hinders access to finance for borrowers, leading to a reduction in investment opportunities, therefore curbing the growth prospects of the economy. This has a notable effect on the unemployment rate in the country as investors are unable to borrow at the current interest rate to expand their businesses.

It also affects the living standards of individuals who wish to start businesses because they are discouraged since acquiring capital through credit would be expensive (Kiptui, 2014).

Given this negative effects of high interest rate spread on the economy, it is still unclear why interest rate spread continues to rise in Ghana. The critical question to ask is why is that savers earn low interest on their deposits but when they go to the banks to borrow funds, the lending rates are so high? Comment (reconstruct, is this the problem)

1.3 Objectives

The main objectives of this study is to investigate the determinants of interest rate spread in Ghana

- i. To investigate the existence of a long run relationship between interest rate spread, macroeconomic variables and banking industry characteristics.
- ii. To examine the short and long run effects of macroeconomic variables on interest rate spread in Ghana.
- iii. To examine the short and long run effects of banking industry characteristics on interest rate spread in Ghana.

1.4 Hypotheses

- i. H_0 : There is an existence of a long run relationship between interest rate spread, macroeconomic variables and banking industry characteristics.
 H_1 : There is no long Run Relationship existing between interest rate spread, macroeconomic variables and banking industry characteristics.
- ii. H_0 : Bank industry characteristics influence the spread in commercial banks interest rate in Ghana.

H₁: Banking industry characteristics do not influence the spread in commercial banks interest rate in Ghana.

iii. H₀: Macroeconomic conditions influence the spread in commercial banks interest rate in Ghana.

H₁: Macroeconomic conditions do not influence the spread in commercial banks interest rate in Ghana.

1.5 Significance of The study

When the spread in interest rate is high, it indicates that there is limited efficiency the banking sector. This state of affairs has important repercussions for Ghana's growth and development agenda especially when previous studies have demonstrated that economic growth is linked to the efficiency of intermediation in the financial sector. Potential savers are normally discouraged when the spread in interest rate tends to be too high because of the non-motivating returns they are likely to obtain on their deposits which places a limitation on the availability of funds for deficit units. Just a portion of funds generated by the financial institutions is made available for investment purposes due to the cost of intermediating between savers and borrowers. This at the end of the day reduces lending, investment and economic growth.

The findings of the study will therefore be of policy relevance in sense that it will provide the industry players in particular the Bank of Ghana and Government.

The research will also contribute to the body of knowledge and serve as a reference for future studies.

1.6 Organization of the Study

The study is organized into five main chapters. The first chapter deals with the general introduction to the study which includes the background, problem statement, hypotheses, relevance and organization of this study. The second chapter deals with a critical review of

both the theoretical and empirical literature related to interest rate spread. Chapter three deals with the methodology of the study. Chapter four will focus mainly on the presentation, analysis and discussion of the results in relation to each of the specific objectives of the study. Chapter five will deal with the summary of the main findings of the research, conclusion and proffer policy recommendations based on the findings of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Concept of Interest Rate Spread

Interest rate spread can be well-defined by the market structures which are characteristics of the banking sector. Two types of interest rate spread are of interest here; Pure and Actual spread. For Ho and Saunders (1981), pure spread is normally subject to the size of bank transactions, extent of management of bank risk, variability and the elasticity of interest rate. Actual spread in addition to being inclusive of the pure spread, is affected by macroeconomic variables such as fiscal and monetary policy, cost of transactions, reserve requirements, direct taxes, and forced investment in defining interest rate spread.

2.2 The Determinants of Interest rate spread in Non-African Countries

One of the earliest studies to have investigated empirically the factors that determine interest rate spread was carried out by Hanson and Rocha (1986). This study was conducted with the growing concern that a large spread was an impediment to financial intermediation. The perception was that high interest rate spread discourages potential savers with low returns on their savings and investors with reduced feasible investment opportunities. The study employed an aggregate data from 29 countries spanning from 1975 to 1983. The authors attributed the high interest rate spread to large cost of operation, low competition, financial restraint and high rates.

Demirguc and Huizinga (1998) investigated the effect of microeconomic and macroeconomic factors on the commercial banks margin in eighty (80) industrial and developing countries over the period 1988-1995. Their results indicated that, *ceteris paribus*, assets to GDP ratio

reduces the bank margin. Lower interest margins are also influenced by lower market concentration ratio. They also found out that international banks have higher margins than domestic banks in developing countries while in developed countries the margin of foreign banks are lower than that of local banks. Kroszner (1999) studied the interest rate spread in Romania using data spanning over the period from 1997 to 1999. The author found out that high interest rate is a barrier to development and recommended that government should remove the monopoly and control the inflation and the exchange rate.

Yu (1995) has observed that the regulation of bank capital greatly influence interest rate spreads. This according to the author is because interest spread has a positive correlation with capital-to asset ratio. Normally, the minimum capital requirement leads to a rise in the cost of capital and this is mainly passed on to borrowers. The minimum capital requirement has also been propounded as an important regulation variable by Madura *et al.* (1992) to also influence bank interest rate margins. The leverage in terms of finance of banking institutions can be reduced due to higher equity positions. This implies that when the equity of the bank increases this should serve as an incentive for banks to translate that into higher margins to be able to cover the increased cost of capital. This is determined by the nature of the preference of decision making by the various financial institutions. They observed that the particular form of the bank decision-makers preference function is an important variable in predicting the response of interest rate margins to variations of deposit insurance and bank capital standards. Ngugi (2001) also asserts that the legal and regulatory framework influences the efficiency of banking institutions to function efficiently and hence determines their stability financially.

Gambacorta (2004) examined the microeconomic and macroeconomic factors that influence the differences in interest rates of a cross section of banks in Italy. The microeconomic variables included in the study are operating cost, reserve requirements, structure of the industry, the demand for deposit and loan, credit risk while the macroeconomic variables included interest rate fluctuations, impact of monetary policy through changes in policy rates. The results of the study showed that the size of the bank have no effect on interest rate margin. The study also revealed that well capitalized banks and rates on short term lending are less reactive to shocks to monetary policy. Additionally, interest rates are more or less unchanged in banks that for the most part lend for long term as compared to that of short term lending.

2.3 Interest rate spread in African Countries

Chirwa and Mlachila (2002) found that wide interest rate spreads were associated with high discount rates (or bank rate), high reserve requirements (implicit tax) and high inflation rates in Malawi. In Kenya, it was found by Ngugi (2001) that monetary policy tightening and increasing the treasury bills rate widened the interest spread. Crowley (2007) found that higher reserve requirements were associated with higher interest rate spreads in English-speaking African countries. A panel data approach was adopted by Chirwa *et al* (2004) to ascertain the drivers of the spread in interest rate in Malawi's commercial banking sector particularly during the period of liberalization i.e. the 1990s. The authors found out that results show that the wide spread in interest rate was a result of inflation, high policy rate, monopoly and increased reserve requirements.

Beck and Hesse (2006) in attempt to provide answers to the increasing interest rate spread in Uganda employed data on the bank-level. Their results indicates that there was no link

between privatization and interest rate spread but proceeds confirm that foreign banks normally have low spread in interest rate. By the same token, the macroeconomic variables included in the study were unable to explain the vast variation in interest rate spread. The banking industry specific variables, alternatively were able to provide some explanations to the increased interest rate spread. These are operating costs, bank size and composition of loan portfolio. Nevertheless, time-invariant bank-level fixed effects was also able to offer some explanation for large chunk of bank variation in spreads and margins.

In Latin America, Gelos (2006) found that high interest rates and reserve requirements were major contributors to high interest rate spreads, while GDP growth was associated with narrower interest rate spreads. Folawewol and Tennant (2008) further investigated the determining factors of the spread in interest rate in 33 Sub-Saharan African (SSA) countries. Their study was mainly focused on the macroeconomic variables. They found out that the consequences and extent of government borrowing tends to contribute to high spreads in interest rate. The deficit in the public sector in addition to inflation, high policy rate, money supply, the central banks' reserve requirement, increase in population and the level of economic development also contributed significantly to the wide spread in interest rate.

Eita in 2012, used quarterly data spanning from 1996 to 2010 and found that macroeconomics variables are important factors explaining interest rate spread in Namibia. Eita (2012) found that inflation rate, bank rate and the treasury bills rate increase whilst the size of the economy and financial deepening decrease the interest rate spread. Tarus et al., (2012) examined the determinants of net interest margin of commercial banks in Kenya. Their pooled and fixed effects regression results indicated that operating expenses and credit risk has a positive effect on net interest margin. Their study has also revealed that higher inflation widen net interest margin whereas economic advancement and market intensity have

adverse consequences on net interest margin. Ahokposi (2013) investigates the determinants of bank interest margin in Sub-Saharan Africa. The results of his study show that market concentration is positively related to interest margins, while bank specific factors such as credit risk, liquidity risk and bank equity are important determinants of interest margins in Sub-Saharan Africa.

Nampewo (2013) employed time series data for the period 1995-2010 to investigate the underlying factors behind the wide spread in interest rate in Uganda. The methodology employed by the study was based on the two-step Engle and Granger procedure. The study revealed that the Treasury bill rate, non- performing loans and the bank rate have a direct relationship with interest rate spread while an indirect relationship was established between GDP in constant prices the ratio of money supply to GDP M2/GDP ratio and interest rate spread. The deficiency of the study is that it focused only on the macroeconomic variables leaving out the industry specific variables.

2.4 Determinants of Interest rate spread in Ghana

Bawumia *et al* in (2005) took the lead to empirically investigate the subject matter in Ghana. Their study was based on two fundamental approach using the econometric and accounting methods. Their results revealed that the financial system was not able to reach its optimal efficiency potential because of concentrations in the market, foremost structural impairments and the degree of competition in the banking industry. The spread in interest rate was explained by the share of the market one possess. This is suggestive of the inadequacy of competition based on pricing in the sector. Other factors were also found to have a significant influence on the spread notable among them are nonperforming loans, liquidity reserves and

high cost of operation with varying influences but not as potent as the explanatory power of the market share variable.

Aboagye, et al (2008) in attempt to also provide answers in the subject matter under consideration used the banking sector specific variables, macroeconomic indicators among others to ascertain their influence on the spread in interest rate. For them, the industry specific variables are key in influencing interest rate spread. Their results revealed that the high rates on Treasury bill as well as surplus bank reserves leads to the lessening of the spread on interest rates. The study also found out that high inflation, administrative and operational costs, monopoly power and the extent of risk averseness of the banks makes to increase the net interest margin.

Sarpong et al. (2013) investigated the causal factors behind the increase spread in interest margins in the Ghanaian economy. Their study relied on time series data and the analysis was based on panel EGLS. The authors revealed that the commercially banks do not only use high interest spread to cushion against their operational costs and the legally mandatory reserve required by the central bank but also indicates that banks with market power leverage on this to their advantage while others use it to indicate their loan quality. Furthermore, the banking industry concentration, economic activity proxied with GDP, inflationary pressures and the rates on Treasury bill did not have any influential power on interest rate spread as indicated by previous studies. The study further showed that commercial banks in Ghana view reserve requirements as a form of indirect taxation and hence react to these by increasing the margin between lending and deposits rates. It was established that the main determinant of interest rate margin are fees, liquidity and operation cost. Non-performing loans evident significant when lagged one year is not a strong determinant of interest rate spread in Ghana as

purported by most financial institution. The authors recommended that banks should work on improving on their efficiency so that they reduce their fees and operation cost to reduce interest rate spread.

Garr Kyereboah-Coleman(2013) examined bank and industry specific as well as macroeconomic variables which affect interest rate spreads in commercial Banks operating in the Ghanaian economy using unbalanced panel data set from 33 commercial banks covering the 21-year period 1990 to 2010. The study employed annual time series data from 1990 to 2010.

Their results suggest that interest rate spread in Ghana is significantly influenced by bank-specific and macroeconomic variables. These are bank ownership, Management inefficiency, Gross Domestic Product Per Capita (GDPPC) and Government Securities which all have positive relationship with interest rate spreads. Government borrowing on the other hand also influences interest rate spreads significantly but has a negative effect. It has been found that locally-owned banks in Ghana have wider spread than their foreign counterparts, while management inefficiency, GDPPC and Government Security and Government borrowing also have significant relationship with interest rate spread. Management Efficiency, GDPPC and Government Security have positive relationships with interest rate spreads. The outcomes confirm a perception that locally-owned banks tend to have wider spreads than foreign-owned banks, an indication that locally-owned banks are regarded as less efficient and therefore cover for their inefficiency by increasing the interest rate spread. Management inefficiency means higher expenses and for inefficient banks to match the high expenditure lending rates must be increased while borrowing rates are kept low resulting in wide interest rate spread.

For the macroeconomic variables, an increase in GDPPC means as income levels go up, interest rate spread increases, suggesting that bank customers demand more loans as their economic conditions improve and also depositors make more money available to the banks and therefore banks can afford to increase interest charged on loans and reduce interest paid on deposits. The positive relationship between interest rate spread and Government Securities points to the fact that investment in Treasury bills creates shortage for loanable funds and therefore bank managers can only make more loans by charging more interest on loans that would compensate for the high cost of borrowed funds.

On the other hand Government direct borrowing results in lowering of interest rate spread. Government is classified by banks as a low risk customer. Government loans are therefore contracted at lower interest rates. The more Governments borrow from the banks the more comfortable the banks are and so interest rate spread is minimised. The paper's findings are important for central banks, the commercial banks and managers of the economy for efficiency and effectiveness.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section deals with the methodology employed in this study. Section 3.2 presents the econometric model and apriori expectations of the regressors used in this study. Section 3.3 focuses on the strategy used in estimating the econometric model. Specifically it deals with test of unit roots, cointegration and error correction model. Finally, section 3.4 deals with the description of variables and their sources.

3.2 Model Specification

Following works done by Demirguc-Kunt and Huizinga (1999), Barajas et al. (2000) and Bawumia et al. (2005), in which interest spreads are specified as a function of both industry characteristics and macroeconomic variables, this study will examine the elements influencing interest rate spread as;

$$IRS_t = +\delta Y_t + \phi Z_t + \varepsilon \dots\dots\dots 1$$

Where IRS_t is the average interest rate spread at time t which is the difference between lending rate and deposit rate. Y_t is the industry characteristics which is time variant, Z_t represents the time variant macroeconomic conditions prevailing in the country and ε_{it} is the error term.

In this study Y has its members as Total bank deposit (TD) and Financial Sector development (FD). Z has Gross Domestic Product (GDP), Inflation (INF), Exchange Rate (EXC) and Treasury Bill Rate (TB) as its members.

Replacing Y and Z with its elements in equation 1, the log-linear specification of the model becomes

$$\ln IRS_t = \alpha_0 + \beta_1 TD_t + \beta_2 \ln FD_t + \beta_3 \ln TB_t + \beta_4 \ln INF_t + \beta_5 \ln EXC_t + \beta_6 GDP_t + \beta_7 EXC_t + \varepsilon_t \dots 2$$

Where $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ represent the elasticities of the regressors with respect to the interest rate spread (IRS)

3.2.1 Description and Apriori Expectations of variables

Total Bank Deposit (TD) - The amount of loanable funds supplied by the banking industry is dependent largely on the total amount of deposits they are able to mobilize. Therefore when the amount of total deposits mobilized by the banks increases, more loanable funds will be made available for and eventually lead to a decrease in lending rates. It implies that when lending rates decrease for a given level of deposit rates, interest rate spreads are anticipated to be low. It is therefore expected that this variable has a negative relationship with interest rate spread.

Financial Sector Development (FD) - the ratio of money supply to GDP, the ratio of currency-in-circulation to money supply, credit to the private sector as a share of GDP or the ratio of total bank assets to GDP are the indicators usually used to proxy for financial sector development or financial deepening . Tennant and Folawewo (2008) indicates that an increase in any of these ratios is a sign of advancement in the growth of the financial

industry. Therefore when interest rate spreads are high, it indicates that there is inefficiency in the banking sector which is associated with lower financial deepening.

Treasury Bill Rate (TB): Generally regarded as a gauge of the interest rate policy being pursued by government, it is also a yardstick for rates charged by banks. This variable is therefore, also expected to positively influence the spread in interest rate because lower Treasury bill rates lead to lower lending rates, hence lower interest rate spreads and vice versa.

Inflation Rate (INF): The Consumer Price Index (CPI) is used as a proxy for Inflation which indicates the cost of business operation in the economy. Higher rate of inflation is expected to Result in higher lending rate. Therefore, it is anticipated that inflation rate would be positively related to interest rate spreads, especially in developing economies where, inflation rates are high and variable (Chirwa and Mlachila, 2004).

Gross Domestic Product (GDP): Gross domestic product at 2006 constant prices is used to proxy for economic activity. Lending rates could increase due to an increase in commercial activity. However, increased economic activity can make investments more lucrative, reduce defaults, and increase deposits, and eventually reducing the spreads.

Exchange Rate (EXC): The relationship between interest rate spreads and exchange rate is expected to be positive. This is because when the US dollar is rising against the Cedi, the banks are at greater currency risk by investing or lending in a depreciating currency.

3.3 Estimation Strategy

The analysis of time series data, generally involves three (3) steps. These are test of stationarity, cointegration (long run relationship) and the estimation of long and short run relationship. These steps which are followed to estimate equation 2 are outlined below.

3.3.1 Unit Root Test

A test of unit root is the test for order of integration of the series. This is necessary because macroeconomic variables are generally trending and normally not stationary. When variables being used for analysis are non-stationary, it usually leads to spurious regression results. In such a case, the t-statistic, DW statistic as well as the R^2 values are not accurate and invalid for inference. This study makes use of the Augmented Dickey Fuller (ADF) Philip Perron(PP) unit root test.

The ADF and PP test for unit root tests the null hypothesis of unit root against the alternative that the variable in question is stationary. Thus acceptance of the null hypothesis implies that the series has a unit root and hence non-stationary. Similarly, rejection of the null hypothesis of unit root implies the series is stationary.

3.3.2 Test for Cointegration (though the two series may not be stationary this used to see if the move together in the long run)

The ARDL bounds test which was developed by Pesaran et al., (2001) is used to explore the existence of the long run equilibrium among the series. One advantage of this approach is that it can be applied irrespective of whether the variables are $I(0)$ or $I(1)$, unlike other widely used cointegration techniques which requires all of the regressors to be integrated of the same order. According to Ghatak and Siddiki (2001) the ARDL model is the more statistically significant approach to determine the cointegration relation in small samples while the Johansen co-integration techniques require large data samples for validity. To implement the bounds test procedure for cointegration, the following conditional version of the *ARDL* model is estimated to test the long-run relationship between IRS and its determinants:

$$\begin{aligned}\Delta IRS_t = & \alpha_0 + \beta_1 \ln IRS_{t-1} + \beta_2 \ln TD_{t-1} + \beta_3 \ln FD_{t-1} + \beta_4 \ln RER_{t-1} + \beta_5 \ln TB_{t-1} + \beta_6 \ln INF_{t-1} + \beta_7 \ln GDP_{t-1} \\ & + \beta_8 \ln EXC_{t-1} + \sum_{i=1}^m \phi_i \Delta \ln IRS_{t-i} + \sum_{i=1}^m \delta_i \Delta \ln TD_{t-i} + \sum_{i=1}^m \eta_i \Delta \ln FD_{t-i} + \sum_{i=1}^m \varphi_i \Delta \ln TB_{t-i} \\ & + \sum_{i=1}^m \tau_i \Delta \ln INF_{t-i} + \sum_{i=1}^m \omega_i \Delta \ln GDP_{t-i} + \sum_{i=1}^m \lambda_i \Delta \ln EXC_{t-i} + \varepsilon_t \dots\dots\dots 3\end{aligned}$$

where all variables are as previously defined and Δ is the first difference operator. β_i are the long run multipliers in the *ARDL* model, $\phi, \delta, \eta, \varphi, \tau, \omega$ and λ denote the short-run dynamics of the model to be estimated based on the error correction framework. α_0 is the constant term and ε_t is white noise error term.

3.3.2.1 Bounds Testing Procedure:

The first step in the *ARDL* bounds testing approach is to estimate equation (3) by ordinary least squares (*OLS*) to test for the presence of a long-run relationship among the variables by conducting an F-test for the joint significance of the constants of the lagged levels of the variables, i.e.,

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0 \text{ against the alternative}$$

$$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$$

The test which normalises on IRS is denoted by

$$F_{IRS}(IRS | TD, FD, TB, INF, GDP, EXC)$$

Two asymptotic critical values bounds provide a test for cointegration when the independent variables are $I(d)$ (where $0 \leq d \leq 1$): a lower value assuming the regressors are $I(0)$ and an upper value assuming purely $I(1)$ regressors. If the F-statistic is above the upper critical value, the null hypothesis of no long-run relationship can be rejected regardless of the orders of integration for the data. Conversely, if the test statistic falls below the lower critical value the null hypothesis cannot be rejected. Finally, if the statistic falls between the lower and upper critical values, the result is inconclusive.

In the second stage of the ARDL bounds approach, once cointegration is established the conditional ARDL $(p, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8)$, the long-run model for IRS_t can be estimated as:

$$\ln IRS_t = \alpha_0 + \sum_{i=1}^p \beta_1 \ln IRS_{t-i} + \sum_{i=0}^{q_1} \beta_2 \ln TD_{t-i} + \sum_{i=0}^{q_2} \beta_3 \ln FD_{t-i} + \sum_{i=0}^{q_5} \beta_5 \ln TB_{t-i} + \sum_{i=0}^{q_6} \beta_6 \ln INF_{t-i} + \sum_{i=0}^{q_7} \beta_7 \ln GDP_{t-i} + \sum_{i=0}^{q_8} \beta_8 \ln EXC_{t-i} + \varepsilon_t, \dots \dots 4$$

This involves selecting the order of the ARDL $(p, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8)$ model using Akaike Information Criterion.

The third and final step, involves obtaining the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. This is specified as follows:

$$\Delta IRS_t = \alpha_0 + \sum_{i=1}^m \phi_i \Delta \ln IRS_{t-i} + \sum_{i=1}^m \delta_i \Delta \ln TD_{t-i} + \sum_{i=1}^m \eta_i \Delta \ln FD_{t-i} + \sum_{i=1}^m \varphi_i \Delta \ln TB_{t-i} + \sum_{i=1}^m \tau_i \Delta \ln INF_{t-i} + \sum_{i=1}^m \omega_i \Delta \ln GDP_{t-i} + \sum_{i=1}^m \lambda_i \Delta \ln EXC_{t-i} + \psi ECM_{t-1} + \varepsilon_t, \dots \dots 5$$

$\phi, \delta, \eta, \varphi, \tau, \omega$ and λ denote the short-run dynamics coefficients of the model's convergence to equilibrium and ψ is the speed of adjustment to long-run equilibrium following a shock to the system.

3.4: Data Sources

Annual time series data ranging from 1970 to 2013 was utilized. Data on interest rate spread was obtained from International Financial Statistics (2015) and Bank of Ghana. Data on GDP, Inflation, exchange rate, Financial Development and Total bank deposits was obtained from World Development Indicators (WDI), 2015. Data on Treasury bill was obtained from Bank of Ghana.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

The chapter presents and discusses the results in line with the objectives of the study.

4.1 Trend Analysis

The purpose of the trend analysis is to explain the behavior of the variables used in this study.

The trend is of importance since it gives an informal way of checking for stationarity of the variables employed in this study. The trends of the series are presented in Figure 4.1

Figure 4.1 Trend in interest rate spread

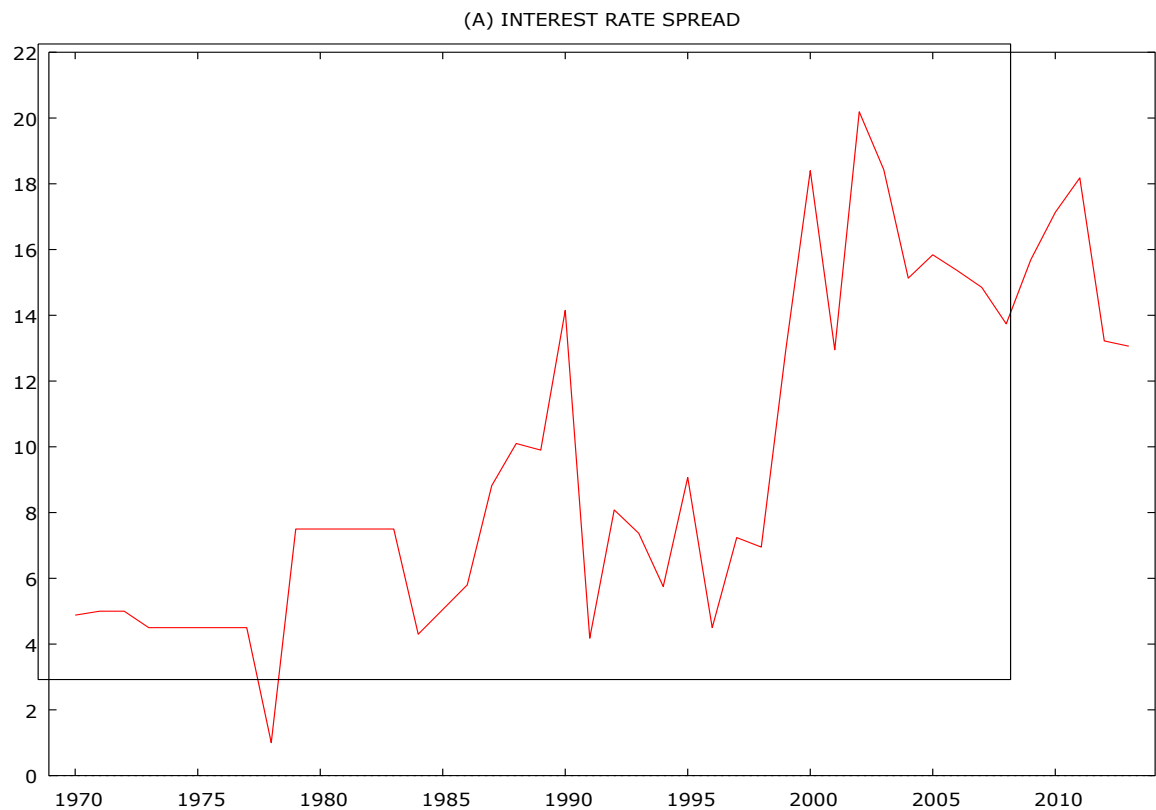


Figure 4.1: Trend in interest rate spread

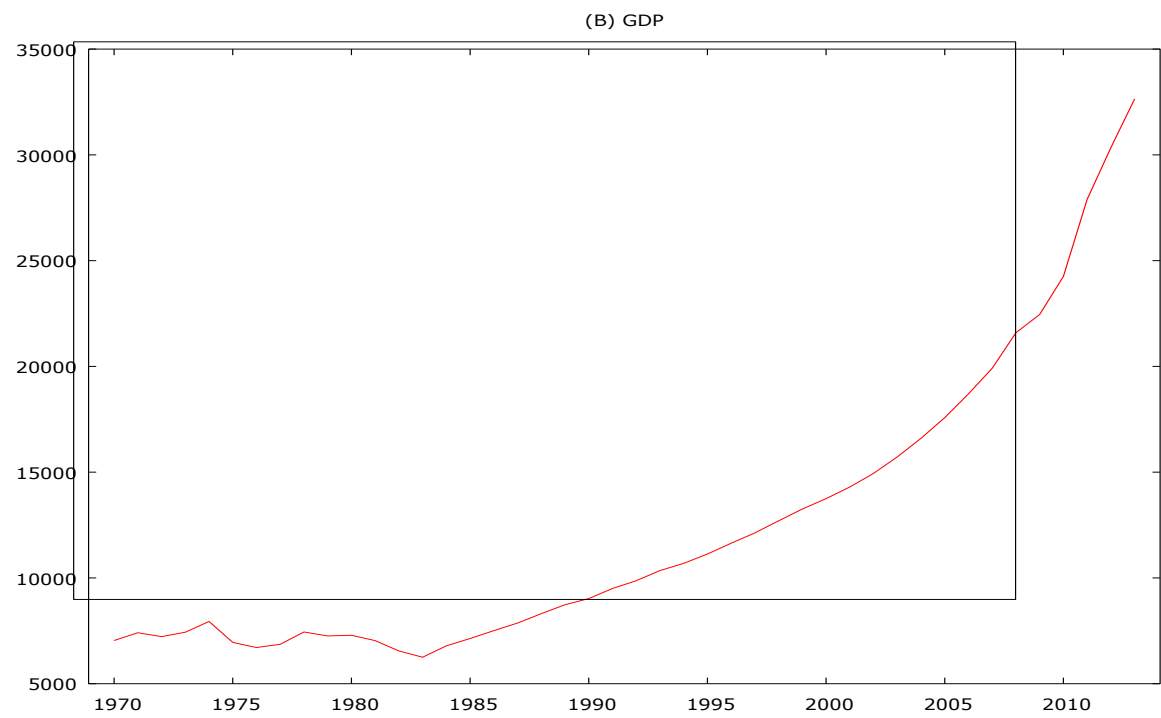


Figure 4.2: Trend in GDP

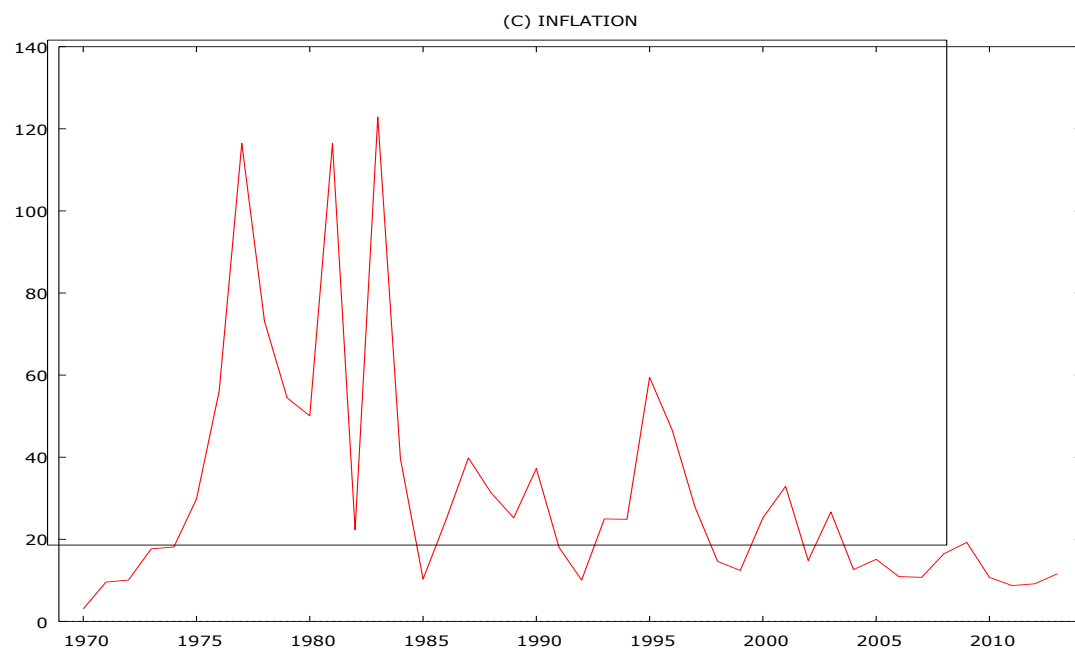


Figure 4.3: Trend in Inflation

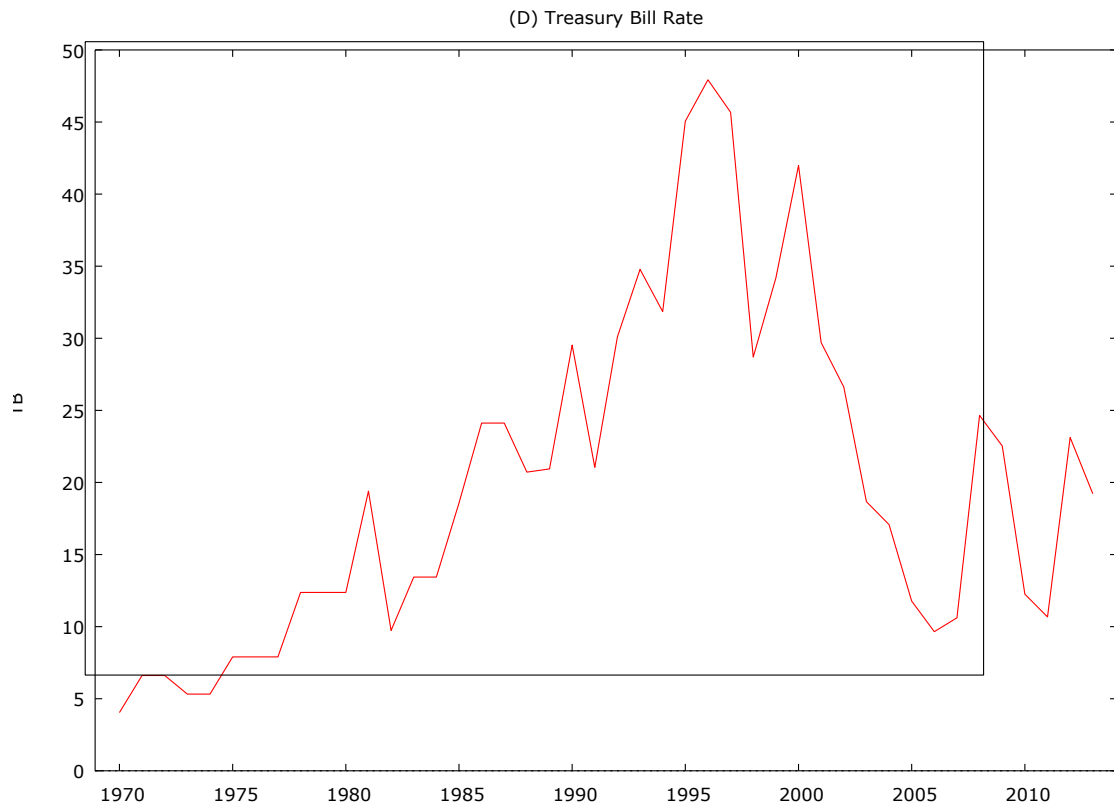


Figure 4.4: Trend in Treasury Bill Rate

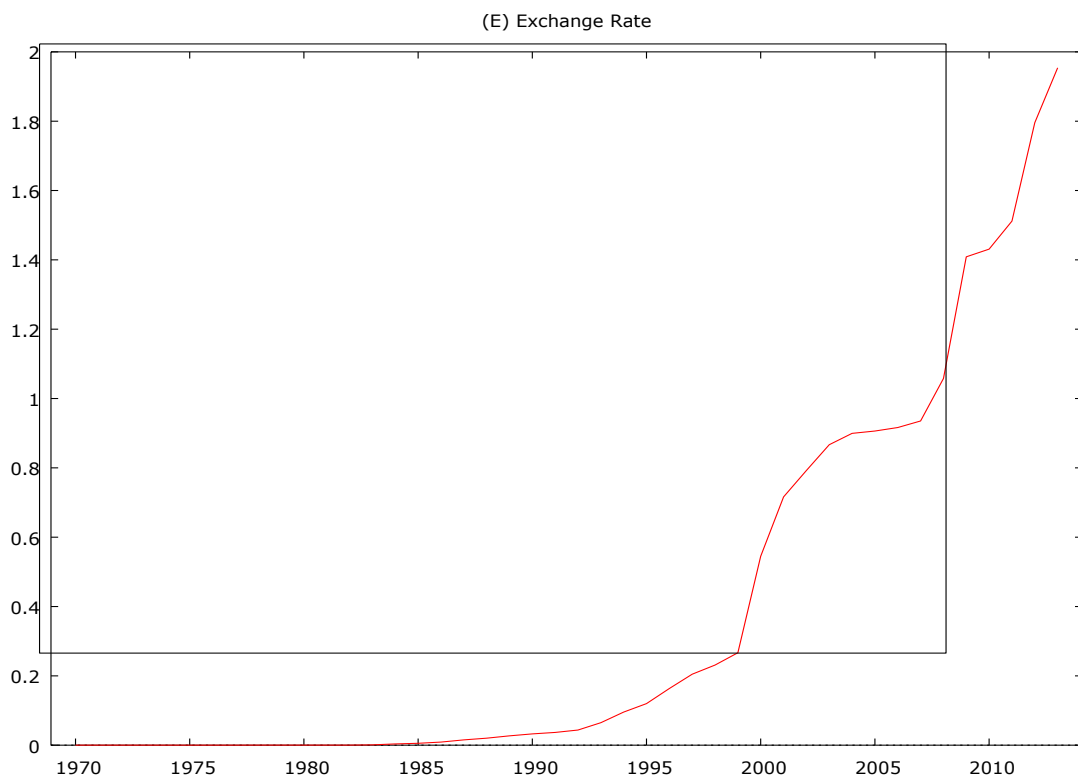


Figure 4.5: Trend in Exchange Rate

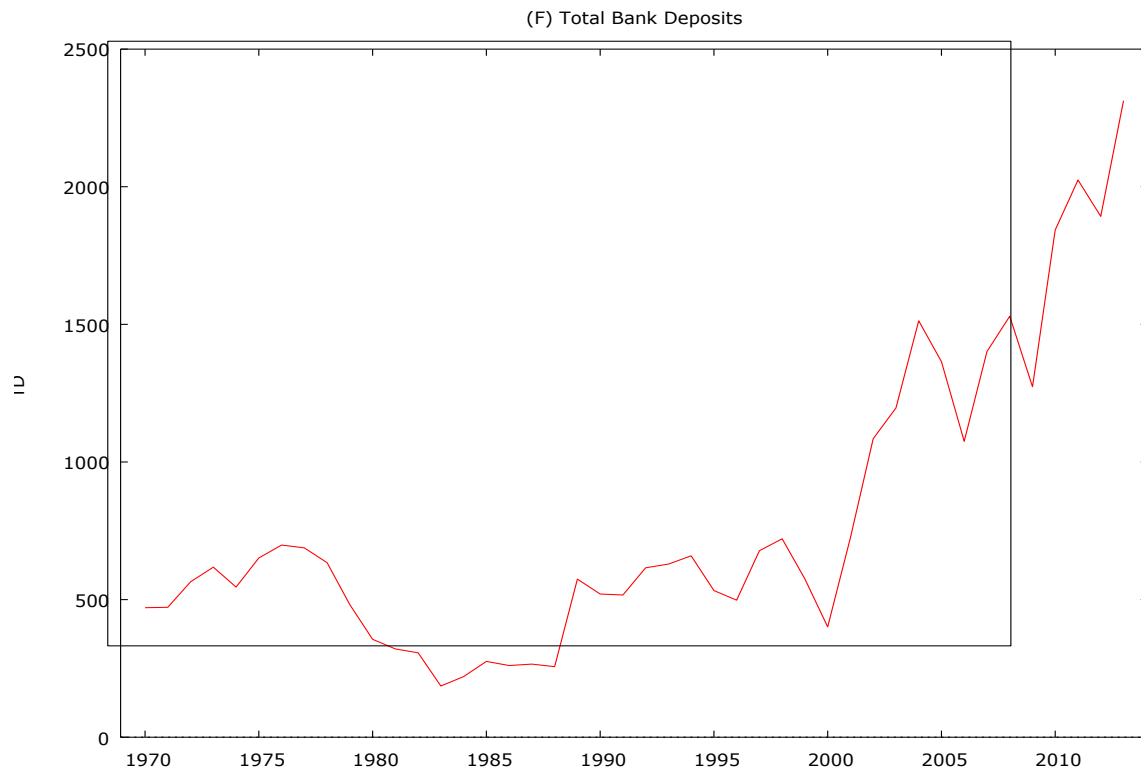


Figure 4.6: Total Bank Deposits

The Ghanaian economy has experienced ups and downs in terms of the interest rate spread (IRS). In 1970 IRS was 5% and remained relatively constant until 1978 when it fell to 0.92%. This fall in IRS was short-lived as it increased to 7.6% in 1979 following the coup d'état in Ghana. In the early 1980s IRS remained constant at 7.5% but fell to 4.3% in 1984 following the introduction of Economic Recovery Program (ERP). In 1990, IRS rose to 14% and declined to 4.4% in 1991. IRS experienced some ups and downs in the 1990s. In the 2000s IRS were relatively high compared to the previous decades. IRS increased from 7% to 18.33% in 2000 and declined to 13.23% in 2001. This decline was followed by an increase to a record high of 20% in 2002. Since then IRS has witnessed some decline up to 2008. IRS increased to 18% in 2011 mainly due to the Global Economic Crisis.

The trend in real GDP from 1970 to 2013 is generally an upward one with Ghana experiencing periods of positive and negative growth rates. Real GDP was relatively constant

(with some periods of up and downs) in the 1970s. In the early part of 1980s real GDP started to experience some negative growth rates. Following the Economic Recovery Program, the economy started to experience some positive growth rates. Since then the economy has experienced positive growth rates.

Inflation Rate (Consumer Price Index) in Ghana (Fig 4.1c) in general has experienced much volatility from 1970-2013. In 1970, inflation was as low as 2.9%. The inflation rate started to increase since then at an increasing rate and peaked at 116.7 % in 1977. This was followed by a decline up to 1980 where the inflation rate fell to 50.83%. The 1980s also witnessed a marked increase and decrease in the rate of inflation. Inflation rate fell to 10.83% in 1985. In the 2000s, inflation rate also experienced some volatility although not as severe as the 1980s.

The trend in rate on government's Treasury bill has been on the increase from till 1996. The rate increased from 3.61 % in 1996 to reach a peak at 19.03% in 1981. This was followed by a sharp decline to 10% in 1982. The rate then bounced back and continued to increase after that sharp decline and reached a peak of 47.50% in 1996. This unprecedented rate could be ascribed to measures taken to deal with the high inflation rate experienced at that time. The rate has since decline to 9.72% in 2006 and as at 2013 the rate was 19.03%.

The movement in the exchange rate has been that of an upward trajectory as the Ghanaian cedi continues to depreciate against the US dollar. Since the mid 1980's the cedi has been performing poorly against the dollar.

Total bank deposits mobilized by commercial banks have experienced so much volatility although the trend appears to be that of an increasing one. Deposit mobilized in the 1980s were much lower which might be due to economic problems experienced at the time. From 2000, bank deposit mobilized have been on the increase and peaked in 2004 followed by a decline in 2009. The deposit rate mobilized by the banks have been on the increase since then.

4.2 Unit root test

The study first tested for the order of integration of the variables in order to determine whether they are stationary or not. This is because most macroeconomic variables are trended and any analysis based on them could lead to spurious results. The results of the unit root test based on ADF (Augmented Dickey Fuller) and PP(Philips-Perron) tests are presented in Table 4.1.

Table 4.1 Results of the unit root test

Variable	ADF		PP	
	Constant No trend	Constant Trend	Constant No trend	Constant Trend
LOG LEVEL				
lnIRS	-1.844	-3.686 **	-2.751*	-5.387***
lnGDP	2.660	-1.062	3.523	-0.469
lnTB	-2.011	-1.789	-2.535	-2.251
lnTD	-0.493	-1.689	-0.497	-1.701
lnFSD	0.246	-3.186 *	0.334	-1.914
lnEXC	-1.013	-1.491	-0.766	-0.986
lnINF	-2.678*	-3.737**	-3.827***	-4.713***

FIRST DIFFERENCE				
$\Delta \ln \text{IRS}$	-6.512 ***	-6.424***	-10.885***	-10.745***
$\Delta \ln \text{GDP}$	-3.281 **	-5.061***	-4.112 ***	-5.884***
$\Delta \ln \text{TB}$	-6.277***	-6.525***	-7.576 ***	-7.604***
$\Delta \ln \text{TD}$	-5.386 ***	-5.682 ***	-6.314 ***	-6.412***
$\Delta \ln \text{FSD}$	-4.363 ***	-5.202***	-5.702***	-6.536 ***
$\Delta \ln \text{EXC}$	-3.851***	-3.869 ***	-3.881***	-3.902***
$\Delta \ln \text{INF}$	-6.083***	-6.249***	-9.119 ***	-9.210***

Note: Asterisks(*), (**), (***) show significant coefficients at the 10%, 5% and 1% significance level

From Table 4.1 it can be seen that apart from inflation, the unit root test based on ADF with constant indicates that all the variables have a unit root at log levels. The null hypothesis that inflation has a unit root is rejected at the 10% level. The ADF test with constant and trend indicates that interest rate spread, inflation and financial sector development were stationary at log levels at the 5% and 10% level respectively. All the other variables are non-stationary.

Conversely the PP test with constant also indicates inflation and interest rate spread were stationary at 1% and 10% respectively while with constant and trend they were stationary at 1% level. All the variables were non-stationary.

The variables were first differenced and both the ADF and PP test conducted again. The result showed that after first differencing all the variables were stationary and thus confirm the absence of I(2) variables.

4.3 Test for the existence of long run relationship based on the Bound's test.

In analyzing, long run relationship based on an ARDL framework, the first step involves testing for the presence of a long run relationship. The study therefore tested the existence of

a long run relationship and the results presented in Table 4.2. Based on AIC, the optimal lag length of one was selected.

Table 4.2. Result of the bound test for cointegration

Estimated equation	$F_{IRS}(IRS TD, FD, TB, INF, GDP, EXC)$			
Optimal lag	ARDL(1,0,0,1,1,0,1)			
F-statistics	95% lower bound	95% upper bound	90 % lower bound	90% upper bound
5.303179	2.27	3.28	1.99	2.94

From the results it can be seen that the F-statistic (5.30) is greater than the 90% lower and upper bounds. The F-statistic is also greater than the 95% lower and upper bounds. Thus the study rejects the hypothesis of no long run relationship.

Therefore, there is a long run relationship among interest rate spread and the industry and macroeconomic variables included in the study.

4.4 Long Run Relationship

After, revealing that there is the presence of a long run relationship among the variables, the study proceeded to estimate the exact nature of the long run relationship. The results of the long run relationship are shown in Table 4.3.

Table 4.3 Results of the long run relationship

ARDL(1,0,0,1,1,0,1) selected based on AIC Dependent variable: lnIRS				
Regressor	Coefficient	Standard error	T-ratio	Prob
Constant	4.383436	3.679500	1.191313	0.2423
lnGDP	0.385383	0.452749	0.851208	0.4010
lnTB	0.479116***	0.153882	3.113539	0.0039
lnTD	-0.587930**	0.252262	-2.330636	0.0262
lnFSD	0.0037054	0.173417	0.213672	0.8322
lnEXC	0.219443***	0.051357	4.272912	0.0002
lnINF	0.041128	0.121528	0.338428	0.7373

Note: Asterisks(**), (***) show significant coefficients at the 5% and 1% significance level

The results shows that in the long run, all the variables are inelastic i.e. have an elasticity which is less than 1.

Specifically the result shows that, Treasury bill have a positive influence on interest rate spread in the long run *ceteris paribus* and it is significant at 1%. This positive influence of Treasury bill on interest rate spread can be attributed to the fact, there is a shortage of funds which can be loaned when people decide to invest in Treasury bill. The commercial banks respond to this by charging high interest on loans in order to cater for the enormous cost involved in acquiring the borrowed funds. This result disagrees with Sarpong *et al.*, (2013) who found a negative effect of Treasury bill rate on interest rate spread although insignificant.

The results also indicate that in the long run, total bank deposit, will affect the spread in interest rate negatively *ceteris paribus* and this is significant at the 5% level. An increase in the volume of total deposits mobilized by the commercial banks implies that there is an increase in the supply of loanable funds for a given level of demand for loanable funds. This implies that commercial banks will reduce the lending rates since supply exceeds demand. A decrease in the lending rates will result to a decrease in interest rate spreads.

Furthermore, in the long run exchange rate has a positive influence on interest rate spread and is significant at the 1% level. A 1% appreciation of the dollar against the cedi results in a 0.22% increase in interest rate spread. The explanation to this can be that the commercial banks take a huge risk by making loans available in a currency that is depreciating and therefore translate that risk by means of higher lending rate which leads to a rise in interest rate spread for a given deposit rate. This result disagrees with Sarpong *et al.*, (2013) who found a negative effect of Treasury bill rate on interest rate spread although insignificant.

4.5 Relationship in the Short Run

The study proceeded to estimate the short run determinants of interest rate spread in an error correction model based on the ARDL frame work. The results are shown in Table 4.4.

Table 4.4: Results of the Short Run relationship

ARDL(1,0,0,1,1,0,1) selected based on AIC Dependent variable: lnIRS				
Regressor	Coefficient	Standard error	T-ratio	Prob
$\Delta \ln \text{GDP}$	-3.967110***	1.015581	-3.906248	0.0005
$\Delta \ln \text{TB}$	-0.476174***	0.1805451	-2.637485	0.0128
$\Delta \ln \text{TD}$	-0.541600**	0.236714	-2.287999	0.0289
$\Delta \ln \text{FSD}$	0.130097	0.250086	0.520211	0.6065
$\Delta \ln \text{EXC}$	-0.274303*	0.152672	-1.796679	0.0818
$\Delta \ln \text{INF}$	0.185603**	0.084517	2.196045	0.0355
ECM	-0.39448***	0.13206	-2.9873	0.005

*, **, *** means significant at 10%,5% and 1% respectively

The error correction term (ECM) represents the speed of adjustment to return to equilibrium in the dynamic model. From the results it can be seen that the ECM is negative and statistically significant at 1% level. The coefficient of the error term is -0.39 which suggests that 39% of the previous year's disequilibrium is corrected in the current year.

Apart from real GDP, all the other variables are inelastic in the short run. The coefficient of real GDP is negative and significant at the 1% level. A 1% increase in real GDP leads to a decrease in the spread of interest rate by 3.97% ceteris paribus. This result implies that in the short run, increased economic activities can lead to an increase in the amount deposited in the banks, projects become more profitable and a reduction in loan defaults thereby making more money available for lending. This implies that for a given deposit rate, the lending rate reduces thereby leading to a decrease in the spread in interest rate. The result contradicts that

of Garr and Kyereboah-Coleman (2013) who found a statistically significant positive relationship between real GDP and interest rate spread.

The coefficient of Treasury bill is also positive and significant at the 1% level. In the short run, a 1% increase in the rate on the Treasury bill leads to an increase in interest rate spread by 0.476%. This implies that savers would love to invest their money in treasury bills whenever the rate is higher than to deposit the money in banks. This in turn constraint the amount of loanable funds available for lending. Given that the supply of loanable fund is less than a given demand level, the managers of the commercial banks respond to this by increasing the rates on lending thereby leading to a rise in the interest rate spreads. The result disagrees with that of Sherif and Amoako (2014) who also found a negative relationship between rates on Treasury bill and interest rate spreads in Ghana.

As in the long run, the coefficient of total deposit is negative and significant at the 5% level in the short run. *Ceteris paribus*, a 1% increase in the total deposits mobilized by the commercial banks decreases the spread in interest rate by 0.54%. Exchange rate was also found to negatively influence interest rate spread negatively in the short run. Specifically, a 1% appreciation of the cedi against the dollar results in a decline in interest rate spreads by 0.27%

The study also showed that in the short run, inflation has a positive effect on the interest rate spread. A 1% increase in rate of inflation leads to an increase in interest rate spread by 0.19%. This positive link between inflation and interest rate spread can be attributed to the fact that higher inflation means that a unit cedi can now purchase fewer goods and services thus people will need more money to purchase the same amount of goods and services thereby leading to cash withdrawals and reduction in deposit rate. This implies that less loanable funds will be available since there is a reduction in deposit. Therefore the supply of

loanable funds will be less than given level of demand for loanable funds. The banks will react to this by increasing the lending rate and thus leading to an appreciation in the spread. This outcome disagrees with Sarpong *et al.*, (2013) who found a negative effect of Treasury bill rate on interest rate spread although insignificant.

4.6 Goodness of Fit and Model Diagnosis

The goodness of fit and model diagnostic tests such as functional form, normality, serial correlation were carried out to check the estimated ARDL model. The results are presented in Table 4.5.

Table 4.5 Result of goodness of fit and Model diagnosis

Goodness of fit	
R-Squared 0.755035	R-Bar-Squared 0.678484
S.E. of Regression 0.34230	F-Stat. 9.863096 [.000]
Akaike Info. Crit 0.90993	Schwarz Bayesian Criterion 1.3606
DW-statistic 1.994198	Residual Sum of Squares 3.7495
MODEL Diagnostics	Test statistic
χ^2_{Auto}	0.226788(0.8928)
χ^2_{Norm}	0.3427(0.8425)
χ^2_{Reset}	0.2549(0.160)
χ^2_{White}	11.8606(0.2940)

From the table it can be seen that the R-squared value is 0.75 which implies that 75% of the variation in interest rate spread is explained by the regressors. The F-statistic is also significant at 1% level indicating that the regressors jointly explain the spread in interest rate spread.

The result of the diagnostic test revealed that the ARDL model is devoid of serial correlation and heteroskedasticity. The diagnostic test also indicates that the model is correctly specified and the residuals are normally distributed. This is evident from the fact that their probability values are insignificant.

Furthermore, the Cumulative Sum of Squares (*CUSUMQ*) and Cumulative Sum (*CUSUM*) were used to ascertain the long and short run stability. According to Bahmani-Oskooee (2001), this two tests are based on the null hypothesis that the coefficient of the vector is the same in all periods. The plots of these two tests are shown in Figure 4.1 and 4.2 respectively.

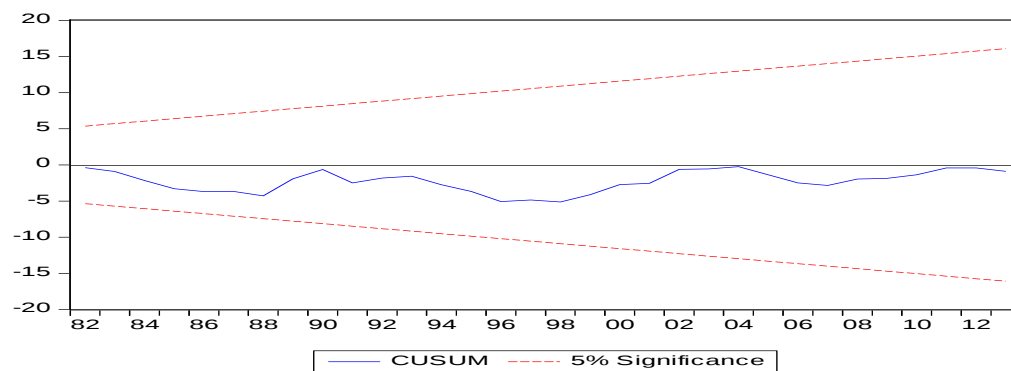


Figure 4.7: Plot of Cumulative Sum of Recursive Residuals

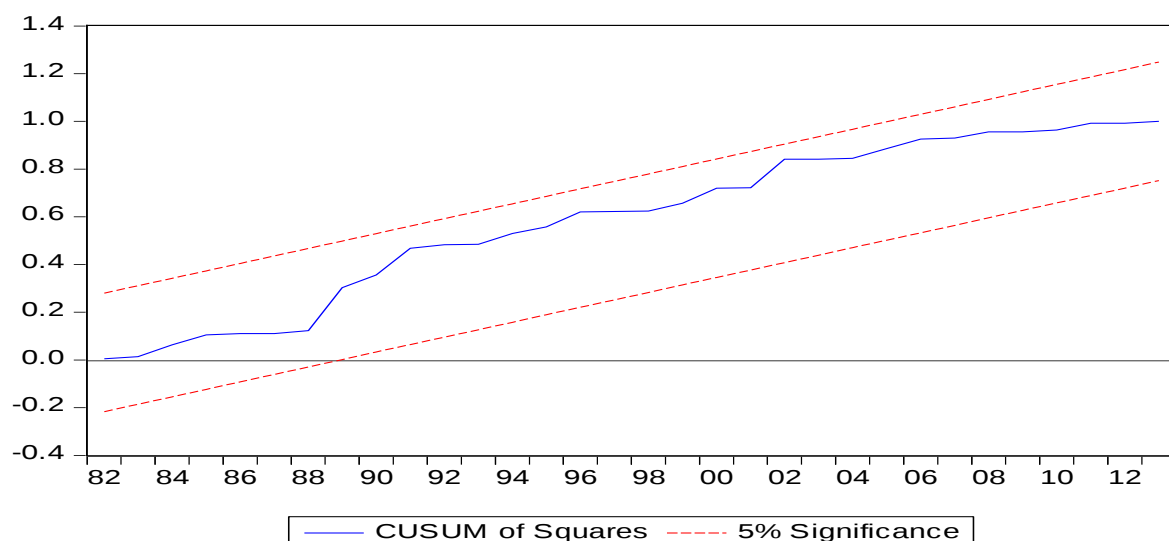


Figure 4.8: Plot of Cumulative Sum of Squares of Recursive Residuals

From the two figures it can be seen that the residuals are within the boundaries. This implies that the stability of the estimated ARDL model is confirmed by these two tests.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of Main Findings

The results of the unit root test based on ADF and PP revealed that in exception of inflation and interest rate spread, all the other variables are integrated of order one thus there is the absence of $I(2)$ variables. The bounds cointegration test based on the ARDL framework revealed a long run relationship among the variables.

The study also revealed that in the long run, treasury bill rate and the total deposit mobilized by the banks have a significant negative effect on the interest rate spread at 1% and 5% level respectively whiles exchange rate have a significant positive effect on the interest rate spread at the 1% level.

In the short run, financial sector development does not have any significant effect on interest rate spread although positive. All the other variables have a significant impact on interest rate spread. Specifically, real GDP, treasury bill rate, total deposit mobilized by the banks and exchange rate have a negative effect on interest rate spread at the α level respectively whiles inflation has a positive effect on interest rate spread at the α level.

5.2 Conclusion

The study investigated the banking industry and macroeconomic determinants of interest rate spread in Ghana in an ARDL framework. Annual time series data covering the period 1970-2013 was sourced from WDI, IFS and BoG. The study revealed that there is the existence of a long run relationship among the variables. In the long run, the only industry characteristic that influences interest rate spread is the total deposit mobilized by the banks. Real GDP and exchange rate also have a significant effect on interest rate spread in the long run. In the short run, real GDP, treasury bill rate, total deposit mobilized by the banks and exchange rate have

a negative effect on interest rate spread while inflation has a positive effect on interest rate spread.

5.3 Policy Implications

The study has demonstrated the importance of macroeconomic stability in reducing the spread in interest rate in Ghana. Specifically, inflation, exchange rate, Treasury bill rate and real GDP have important implications on the spread in interest rate in Ghana.

It is therefore imperative for policy formulation to keep inflation rate as low as possible by the Bank of Ghana implementing the appropriate monetary policies and the ministry of finance implementing appropriate fiscal policies.

Actionable steps should be taken by Government through the ministry of trade and industry to work at stabilizing the depreciation of the cedi against the dollar through increased exports and less imports by enhancing the activities of the Ghana Export Promotion council. The operation of Venture capitalists which is quite unpopular in Ghana should be improved by government making more efforts towards enhancing the activities of the venture trust Fund and its subsidiaries.

Also, the Government should search for alternative ways of generating revenues such as widening the tax bracket, instead of relying heavily on borrowing from the domestic market through treasury bills as this will keep the rate on treasury bills low.

Furthermore, since real GDP was found to negatively influence interest rate spread, steps should be taken to end the power crisis which has crippled economic growth in the country.

REFERENCES

- Aboagye, A.Q.Q., S.K. Akoena, T.O. Antwi-Asare and A.F. Gockel (2008). Explaining Interest Rate Spreads in Ghana, *African Development Review*, Vol. 20, No. 3, pp. 378-399.
- Ahokpossi, C. (2013). Determinants of Bank Interest Margins in Sub-Saharan Africa, Are Interest Spreads So High in Uganda? World Bank Policy Research Working Paper
- Bahmani-Oskooee, M., and Ng, R. C. W. (2002) Long Run Demand for Money in Hong Kong: An Application of ARDL Model. *International Journal of Business and Economics* 1, 147–155.
- Bawumia, M., Belnye, F. and Ofori, M. E. (2005) The Determination of Bank Interest Spreads in Ghana: An Empirical Analysis of Panel Data, Working Paper, Monetary Policy Committee, Bank of Ghana., Accra, Ghana.
- Beck, T and Hesse, H (2006). Bank Efficiency, Ownership and Market Structure: Why Are Interest Spreads So High in Uganda? World Bank Policy Research Working Paper 4027.
- Brock, P. and Franken, H. (2003), Measuring the Determinants of Average and Marginal Bank Interest Rate Spreads in Chile, 1994-2001, Working Papers UWEC-2003-25, University of Washington, Department of Economics.
- Brock, P. and Rojas-Suárez, L. (2000) Understanding the Behaviour of Bank Spreads in Latin America, *Journal of Development Economics*, 71(2), pp. 291-299.
- Chirwa E. W and Mlachila, M (2004). Financial Reforms and Interest Rate Spreads in the Commercial Banking System in Malawi, *IMF Staff Papers* Vol. 51, No. 1, pp. 96 – 122.
- Chirwa E.W. and Mlachila (2004)., “Financial Reforms and Interest Rate Spreads in the Commercial Banking System in Malawi,” *IMF Staff Papers*, Vol. 51, No. 1, 2004, pp. 96-122.
- Commercial Banks in Kenya: A Panel Study. *Procedia Economics and Finance*, 2, 199-208.
- Crowley, J.(2007) “Interest Rate Spreads in English-Speaking African Countries,” IMF Working Paper, WP/07/101.
- Demirguc-Kunt & Peria, M. S. M., (2010). A Framework for Analysing Competition in the Banking Sector. An Application to the Case of Jordan. The World Bank. Finance and Private Sector Development Team, Development Research Group. Policy Research Working Paper 5499.
- Demirguc-Kunt, A. and Huizinga, H. (1998) Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *World Bank Policy Research Working Papers*, WPS1900
- Demirguc-Kunt, A., Laeven, L. and Levine, R. (2003) The Impact of Bank Regulations, Concentration, and Institutions on Bank Margins. *The World Bank*, mimeo.

Eita, J.H. (2012). Explaining Interest Rate Spread in Namibia. *International Business & Economics Research Journal*, 11(10), 1123 – 1132.

Folawewo, A. O. and Tennant D. (2008). Determinants of Interest Rate Spread in Sub-Saharan African Countries: A Dynamic Panel Analysis. A paper prepared for the 13th Annual African Econometrics Society Conference, 9 – 11 July, 2008, Pretoria, Republic of South Africa

Gambacorta, L. (2004). How Banks Set Interest Rates? National Bureau of Economic Research Working Paper 10295, Cambridge.

Garr Kyereboah-Coleman(2013)

Gelbard, E. and Pereira Leite, S. (1999) Measuring Financial Development in Sub-Saharan Africa. *IMF Working Paper*, WP/99/105

Gelos, R.G. (2006). Banking Spread in Latin America. International Monetary Fund. Working Paper 06/44.

Ho, T. and Saunders, A. (1981). The Determinants of Bank Interest Margins: Theory and Empirical Evidence, *Journal of Financial and Quantitative Analysis*, Vol. 16, No. 4, pp.581-600

Kroszner, R.S. (1999). Is the Financial System Politically Independent? Perspectives on the Political Economy of Banking and Financial Regulation. Working Paper. In Laffont, J. 1994. Access pricing and competition. *European Economic Review*, 38: 1673–1710.

Nampewo, D. (2013). What Drives Interest Rate Spreads in Uganda's Banking Sector? *International Journal of Economics and Finance*; Vol. 5, No. 1. pp. 76 – 85

Ndung'u, N. S. and Ngugi, R. W (2000) "Banking Sector Interest Rate Spreads in Kenya," Kenya Institute for Public Policy Research and Analysis (KIPPRA), Discussion Paper No. 5,

Ngugi, R. (2001). An Empirical Analysis of Interest Rate Spread in Kenya, AERC Research Paper 106. Nairobi: African Economic Research Consortium (AERC)

Pesaran M. H, Shin Y, and Smith R. J. (2001) 'Bounds Testing Approaches to the Analysis of

Quaden, G. (2004). Efficiency and stability in an evolving financial system // www.bnb.be/Sg/En/Contact/pdf/2004/sp040517en.pdf.

Randall, R.(1998). Interest Rate Spreads in the Eastern Caribbean. IMF Working Paper, pp. 59 and pp. 98.

Sarpong, D., Winful, E. C., & Ntiamoah, J. (2013). Determinants of Wide Interest Margins In Ghana. Panel EGLS Analysis. *African Journal of Business Management* Vol. 7(35), pp. 3535-3544

Sheriff, I.M. and Amoako, G.K.(2014) Macroeconomic Determinants of Interest rate Spread in Ghana: Evidence from ARDL Modelling Approach. *Journal of Finance and Bank Management* June 2014, Vol. 2(2) pp. 115-132

Tarus, D., Chekol, Y.B. and Mutwol, M (2012) Determinants of Net Interest Margins of Commercial Banks in Kenya: A Panel Study. *Procedia Economics and Finance*, 2, 199-208.

Yu M (1995). "Interest Rate Risk and Duration Structure of Banks in Taiwan", *J. Manage.* 12:269-277.

APPENDIX

ARDL Bounds Test

Date: 07/13/15 Time: 22:43

Sample: 1971 2013

Included observations: 43

Null Hypothesis: No long-run relationships exist

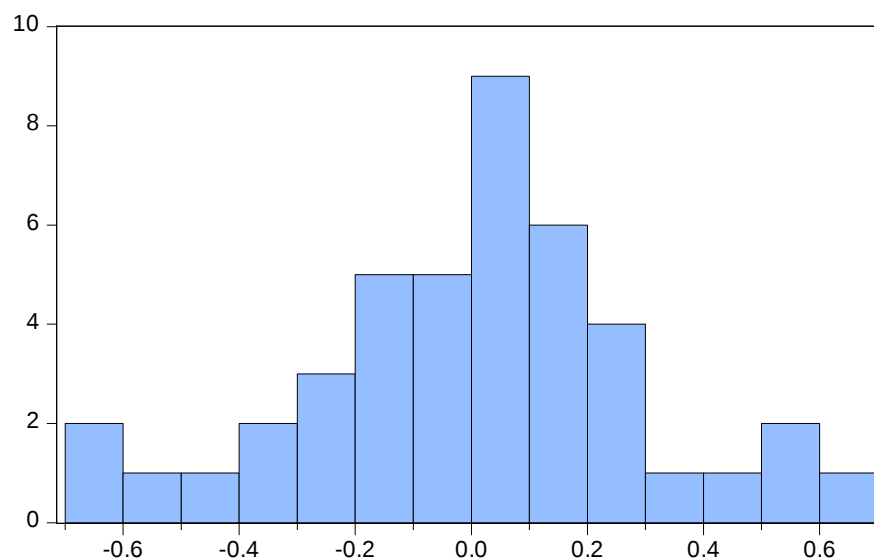
Test Statistic	Value	k
F-statistic	5.303179	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.079532	Prob. F(2,30)	0.9237
Obs*R-squared	0.226788	Prob. Chi-Square(2)	0.8928



Series: Residuals
Sample 1971 2013
Observations 43

Mean 1.06e-15
Median 0.043721
Maximum 0.617187
Minimum -0.674972
Std. Dev. 0.298788
Skewness -0.218556
Kurtosis 2.985247

Jarque-Bera 0.342717
Probability 0.842519

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.219897	Prob. F(10,32)	0.3159
Obs*R-squared	11.86806	Prob. Chi-Square(10)	0.2940
Scaled explained SS	6.524197	Prob. Chi-Square(10)	0.7695
