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DEPARTMENT OF ECONOMICS

MACROECONOMIC DETERMINANTS OF LENDING RATES IN GHANA

A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF THE DEGREE

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DECLARATION

I hereby declare that this thesis is the result of my own original work towards the Master of Science Degree in Economics and that to the best of my knowledge, it neither contains materials published by another person nor materials which have been accepted for the award of any other degree in the university, except where due acknowledgements have been made in the text.

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ABSTRACT

Lending is considered one of the fundamental functions of banks. Loans and advances which may be on long term, medium or short term basis are given to individuals, businesses or even the government to enable them indulge in productive investments and development activities to boost economic activities. Thus, the lending activities can help expand the economy and ultimately promote economic growth and development. The study sought to investigate impact of the Monetary Policy Rate, Financial Development (measured by the ratio of credit to the private sector), inflation and Trade Openness on the lending rate in Ghana. Annual time series data from 1980 to 2015 and the ARDL econometric technique was employed for the study. The study found that the Monetary Policy rate and inflation had a significant positive influence on lending rates in both the short and long run. Financial Development on the other hand, influenced lending rates positively in the short run but negatively in the long run. The study thus recommends policies by monetary authorities to stabilize the MPR and prices in the vain to stabilize. the lending rate.

DEDICATION

I dedicate this thesis to my wife Rehana Obosu and my children Abdul Rahman Kwamena Gyan Sam and Benyameen Ahmed Sam for their love, support and prayers throughout the program.

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CHAPTER ONE

INTRODUCTION

1.0 Background of the study

The financial system is very essential for the growth and development agenda of every economy. With its core function of financial intermediation, that is channeling resources from those with excess to those with a deficit, it provides an important source of financing economic activities which in turn increases consumption, capital accumulation and investment. Banks in their intermediary role are able to diversify risks, which enables them allocate funds more efficiently and lower the cost of financial exchange in the economy (Georgievska *et al*., 2011).

Lending is considered one of the fundamental functions of banks. Loans and advances which may be on long term, medium or short term basis are given to individuals, businesses or even the government to enable them indulge in productive investments and development activities to boost economic activities. Thus, the lending activities according to Mckinnom (2009) can help expand the economy and ultimately promote economic growth and development.

Adedoyin and Sobodun (1991) postulates that lending is unarguably the engine of the banking process and so it should be managed with special skill and agility by management. It contributes significantly to banks' income. For instance, the banking sector in Ghana generated about GHS 1,993 million in 2012 as income accrued on loans which later increased to about GHS2,623 million in 2013 (Price Waterhouse Coopers' PWC, 2014).

Because banks are required to pay interest on deposits they accumulate from several sources, the loans they advance also attract some kind of interest. The lending rate is therefore the interest on loans banks advance to customers. According to Wlliamson (1998), lending rates are set in order to help cover cost incurred by the operations of the banks and also to make profit after borrowers service their loans. Thus it is the payment for the use of capital. The cost of financing through bank loans is thus very essential for efficient allocation of resources in any economy.

The setting of the price of loans according to Choechai (2004) is a very important decision of banks, because the set rate should not be too low to the extent that revenue accrued from the interest will not be enough to cater for the cost of deposits and operation costs as well as the loss of revenue from nonperforming loans or defaults. On the other hand, it should not be set high as to result in adverse selection and moral hazard problems for customers and thus the potential to inhibit access to capital and growth.

However, lending rates may be artificially high coupled with lower deposit rates in situations when the financial system is not adequately developed (Kwakye, 2010), rendering the system uncompetitive and inefficient. Stiglitz and Weiss (1981) further attributed high lending rates to the riskiness of borrowers which may result in the problem of moral hazard and adverse selection. Other factors that are likely to push lending rates high include low quality of loan portfolio, lack of competition in the financial markets, low levels of savings, uncertainty in the business environment, institutional constraints and more importantly profitability of the bank (Georgievska *et al*., 2011).

1.1 Problem Statement

The banking industry is a very critical component of the financial system in developing economies. Its efficient financial intermediation encourages capital accumulation, investments and economic growth (Georgievska *et al*., 2011). The loans give opportunities for individuals and firms to develop and expand their businesses, which increases employment and output as well as the welfare of the people. However, loan provision exposes banks to some risks such as credit risk, which can result in losses. In fact, banks are susceptible to demise because of the risk from loan provision (Elliott, 2014).

The adaptation of the Financial Sector Adjustment Program (FINSAP) in the 1980s, led to the expansion in the number of banks in Ghana. For example, the number of banks increased from 10 (405 branches) in 1988 to 27 (696) branches by 2009 (Adu, *et al*., 2013). It is expected that with financial development, the lending rates should be declining but on the contrary lending rates of banks have been relatively high and is amongst one of the highest in Africa (Bawumia, 2005).

Aboagye *et al*. (2008) indicated that, the high lending rates has resulted in the wide interest rate spread in the economy. Commercial banks are usually accused of charging interests that are far higher than the Bank of Ghana's policy rate and even in situations where the policy rate were reduced, lending rates have been high. For instance, lending rates was 47% in 2000, 32% in 2009 and 38.3% in 2015. These high rates are likely to extort customers and also scare small and medium scale business from acquiring funds to expand business.

The management of the commercial banks have justified this upward trend to the rising cost of operations, macroeconomic instability, high levels of taxes, high reserve requirements and the high

default rates that has limited their ability to operate more efficiently (Bawumia, 2005; Foawewo, 2008; Kwakye 2010).

Indeed, high lending rates are not desirable in any economy, whether developed or developing. It undermines the financial intermediation roles of banks because of the wide interest rate spread associated with it, which is a disincentive to investment and reduces the growth of both industrial production and overall economic performance. Ghana's high lending rate makes it difficult and less competitive to attract investments and thus inhibit growth. Also high lending rate increases cost of productions which is translated into higher prices of goods and services.

Understanding the factors that drive this high lending rates in Ghana is very important. Though scores of studies have studied the lending rates in Ghana, the attention of these studies have focused primarily on the interest rates spread (Bawuwia *et al*. 2005; Garr and Kyereboah- Coleman, 2013; Churchill *et al*., 2014). The important issue that seems to be missing in all these works is what may be causing the ever increasing trends in the lending rates, therefore there is a knowledge gap and thus the need for this study.

This study therefore attempts to add to existing literature by identifying the factors that influence the high lending rates in Ghana from the macroeconomic perspective using time series data from 1980 to 2015.

1.3 Objectives

The main objective of the study is to investigate the macroeconomic determinants of lending rate in the banking industry in Ghana. The study specifically aims to:

i. Examine the trends in lending rates in Ghana ii. Examine the effect of monetary policy rate on the lending rate in Ghana. iii. Analyze the impact of financial development on lending rates in Ghana. iv. Measure the influence of inflation on the lending rates in Ghana.

1.4 Hypotheses

The study tests the following hypotheses;

i. There have not been any significant changes in the trends of lending rates in Ghana.
ii. The monetary policy rate (MPR) does not have any significant impact on lending rates in Ghana.
iii. Financial development does not have any significant impact on lending rates in Ghana. iv. Inflation does not have any significant impact on lending rates in Ghana.

1.5 Scope of the Study

The study employed secondary data for the analysis. Annual time series data spanning from 1980 to 2015 on all variables will be used. The macroeconomic variables considered in the study includes Inflation (which is measured as the change in the annual Consumer Price Index), Financial development; proxy as the ratio of credit to the private sector to GDP, MPR (which is used to measure the stance of monetary policy) and trade openness(measured as the ratio of trade to GDP). Data on all the variables were sourced from the World Development indicators, World Bank (2015).

1.6 Significance of the Study

Higher lending rates according to Amidu (2006) has adverse effects on the overall performance of the economy. It is therefore very important to study the lending rates in Ghana since it has been rising over the years in Ghana compared to other countries. To understand the behavior of lending rates it is very essential to know what is actually driving the increase over the years.

Because the lending rate is an indicator of the performance of the financial sector, the study will inform policy makers on the effects of the macroeconomic targets on financial intermediation in the economy. It will also be of great benefit to other researchers in both the academia and the industry, since previous studies on lending rates have focused extensively on the bank specific characteristics, with less importance given to macroeconomic factors.

1.7 Organization of the Study

The study is organized into five chapters. The Chapter one is the introduction which presents the background, research problem, objectives, the significance and scope of the study. The Chapter two presents the review of both theoretical and empirical literature. Chapter three will focus on the methodology to be employed for analysis. The fourth chapter will present the results and analysis of the study. The final chapter concludes the study with the findings, recommendations and suggestions for further research in the area.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents literature related to the analysis macroeconomic determinants of lending rates. The chapter has three sections. The first section describes the theories surrounding the topic of study, the second section examines empirical literature of interest to the topic and the last section draws conclusions from both the theoretical and empirical literatures.

2.1 Theoretical Review

A number of theories have been developed to explain interest rates and its behavior in the economy. This section reviews theories that underpin the determination of lending rates, such as the classical theory of real interest, the liquidity preference theory, the loanable fund theory and the rational expectations theory of interest rate.

2.1.1 Classical Theory of Real Interest Rate

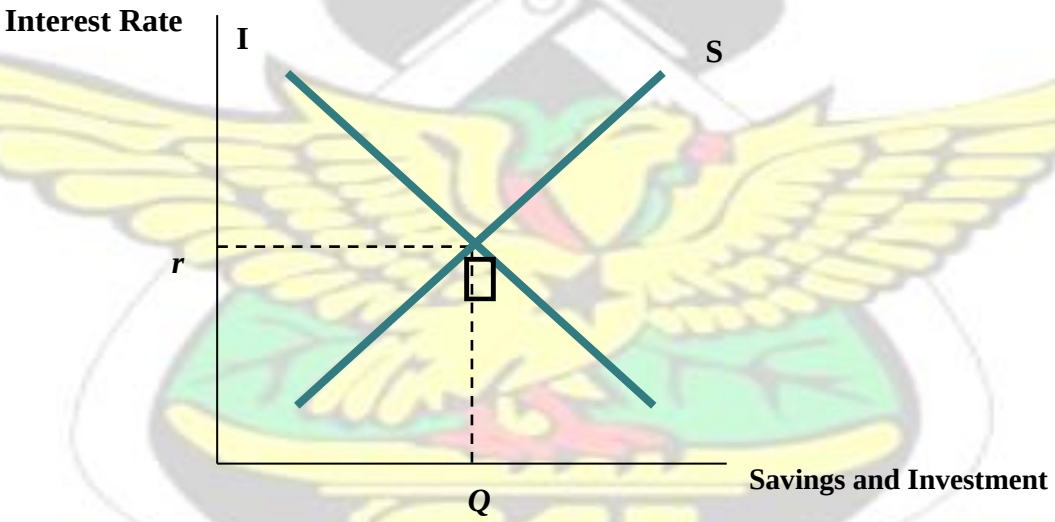
The classical theory of interest rate has been in existence since the 18th century. The classical theory views interest as the price paid for the use of capital and it is determined by the equilibrium levels of demand and supply of capital. The demand for capital represents investments and saving shows the supply of capital.

According to Caplan (2000), the classical theory is based on the thrift on the supply side and the productivity of demand for capital. This shows that to ensure a balance of the productivity of capital goods as well as supply of capital goods, interest has to be paid on capital to compensate or influence individuals to postpone their consumption in the current period and also persuade

individuals to risk their savings. Interest rate thus shows the price of capital and it is set when the level of investment equals the amount of saving.

Interest rate determination from the equilibrium of saving and investment can be represented in Figure 2.1. From Figure 2.1, I is the investment schedule (demand for capital), while S is the saving schedule (supply of capital). The equilibrium rate of interest (r) is established when I and S intercepts.

Figure 2.1: Classical theory determination of interest rate; Saving- Investment equilibrium



The classical theory of interest rate has been criticized extensively by Keynes (1938). The assumption of full employment of resources, which formed the basis of the classical theory of interest was carped by Keynes and considered unrealistic. The theory indicated that with full employment of resources, increases in investments can only be achieved when people postpone consumption and make funds available for investments. In this case people would have to be

compensated for parting with consumption in the current period. In situation where resources are not fully utilized, more investment can be undertaken by using the unused resources. The theory failed to explain why interest is to paid even in situations where resources are found on large scale.

Keynes also disputed the assertion that interest is only a reward for saving and indicated interest can be earned from funds that are not saved like interest earned on funds that are inherited and also, people hold money for other reasons than just a medium of exchange. He also argued that the amount of savings is not only influenced by the rate of interest but also the income levels. He further undermined the classicalist theory of interest by arguing that it can only be determined when the saving and investment functions are known.

2.1.2 The Loanable Funds Theory

The loanable funds theory which was advanced by another school of thought, argued that other factors other than thrift, time preference, waiting and productivity determines interest rates. The theory postulates macroeconomic factors like hoarding and dishoarding of capital, liquidity creation by bank and borrowing for other reasons other than investments are all possible determinants of interest rates in the economy.

Interest rate based on the loanable funds theory is determined by the demand and supply of loanable funds. The demand for loanable funds is not only influenced by investment demands, but also the hoarding of funds, foreign borrowers and also the demand for money for consumption purposes. While the supply of loanable funds is influenced by savings from disposable incomes, liquidity created by banks, dishoarding of funds and lending from foreign sources (Rose, 2003).

The interest rate is thus determined by the equilibrium of the demand and supply of loanable funds. That is at any other rate either the supply of loanable funds will exceed the demand or the demand for loanable funds will exceed the supply. In this case the rate of interest will be adjusting until it reaches a stable level where demand for loanable funds equals the supply.

Keynes (1938) criticized the loanable funds theory, indicating that the concept of hoarding captured in the loanable funds theory is quite ambiguous. He indicated that hoarding can neither increase nor decrease as long as the quantity of money in the economy remains unchanged. He further argued that interest rate determination based on the loanable fund theory is indeterminate since the supply of loanable funds vary with income levels which also determines savings.

2.1.3 The Liquidity Preference Theory

Keynes' (1938) liquidity preference theory showed that interest rate is a prize for parting with liquidity for some period of time. Income can either be consumed or saved. The decision to consume is dependent on the propensity to consume. And also the individual has to decide the portion of his income to hold in cash and the portion to lend out (which depends on the person's liquidity preferences). Liquidity preference shows the desire for people to hold their money in the form of cash balances.

Keynes theory of interest rate postulates people demand money or hold their resources in liquid form because of three reasons; for transactions, precautionary and speculative purposes.

Transactions motive defines people's decision to hold money for current transactions, that is the amount of money kept to cover current payments for goods and services. The demand for money

for current purchases is dependent on income (and also the time incomes are received and the methods of receiving income).

Precautionary motive for the demand of money identifies the decision of individuals to hold money to safeguard against unforeseen circumstances such as sickness, job loss, accidents and other emergencies. Demand for precautionary purposes depends on income, the nature and the conditions of living of the individual.

Finally, people demand money for speculative purposes, that is, to take advantage of the future changes in market movements of interest rates as well as bond prices. Keynes postulates the speculative demand for money can serve as a store of value, by making speculative gains from dealing in interest bearing assets like bonds whose prices more often fluctuates. That is, if people expect bond prices to increase (which means the expected interest on the bonds to fall), they will buy more bonds to sell them when the price actually increases. On the other hand, if they expect the prices to fall, they will sell more of their bonds to avoid loss of capital.

For the speculative demand for money, more money will be demanded when the current rate of interest is lower but more money will be held when the rate of interest is higher. This indicates an inverse relationship between interest rate and the demand for money.

Keynes' liquidity theory was criticized on the following grounds; his theory only considered monetary factors influencing interest rates in the economy without the influences of real factors such as thrift, productivity of capital and saving.

2.1.4 Rational Theory of Interest Rate

The rational expectation theory of interest rate captures the idea that people make economic decisions based on available information, past experiences and expectations. According to Rose (2003), the Rational Theory is built on the evidence that capital and money markets function efficiently in assimilating available information that are likely to affect interest rates and prices of assets. Individuals are able to form unbiased and rational expectations about future demand and supply of credit and interest rates. Thus the best predictor of future interest rates is the current interest rate, and changes in interest rates can also be attributed to unexpected information as well as perceived economic factors.

Interest rates will be close to equilibrium levels if the capital and money markets function efficiently. Thus the rate of interest is likely to change only when economic agents are exposed to an entirely new and unpredicted information. So if they expect interest rate to rise, demand for funds will fall even when the banks are willing to give loans out. And on the other hand demand for funds could increase if they perceive interest rates to fall (Bekaert, 1998).

2.2 Empirical Literature Review

Scores of studies have attempted to investigate the determinants of lending rates. This section presents a review of existing literature on lending rates from other countries and Ghana.

2.2.1 Studies on Other Countries

Demirguc-Kunt and Huizinga (1999) studied the factors responsible for wide interest rate spreads in 80 countries. The study used a panel data estimation based on data series from 1988 to1995. The study considered a matrix of variables on bank specific factors, macroeconomic factors,

institutional factors, implicit and explicit taxes and regulations and structure of the financial sector. The study found that interest rate spread (resulting from high lending rate and low deposit rates) is positively influenced by banks' capitalization, the ratio of loans to total assets, the size of the bank, the costs of operation, foreign ownership of the bank, inflation and real interest rates. The study however found a negative relationship between the spread of interest rate and interest bearing assets.

Brock and Rojas-Suarez (2000) applied the Ho and Sanders two-stage method of estimation to assess the factors influencing the high lending rates coupled with low deposit rates in five Latin American countries. The study found evidence that wide spreads between lending rates and deposit rates in the 1990s could be attributed to liquidity and capital adequacy challenges of banks at bank specific level as well as interest rate volatility, economic growth and inflation.

Saunders and Schumacher (2000) investigated the determinants of high lending rates (more precisely the interest rate spreads) in seven OECD countries. The study employed the two stage Ho-Sanders estimation technique to time series data spanning from 1988 to 1995. The study found that capitalization of banks, the market structure and volatility in interest rate are the main determinants of the spread between lending rates and deposit rates.

Cihiak (2004) investigated the factors influencing lending rates in Croatia from 1999 to 2003. The study modelled lending rates and interest rate spreads as a function of bank's total assets, deposit rate, market share, ratio of nonperforming loans to total assets, capital adequacy, liquidity, treasury bill rates and a dummy variable for private and green-field banks. The result of the study indicated that total assets, foreign ownership and liquidity have an inverse relationship with lending rates

and interest rate spreads. Whereas market share, deposit rates, Treasury bill rate and nonperforming loans have a positive effect on both lending rates and interest rate spreads. The study further indicated that firms with higher capital adequacy are likely to have lower lending rates but because they have relatively lower lending rates, their interest rate spreads are more often wider than banks with lower capital adequacy.

Claeys and Vennet (2003) studied the determinants of the lending rates causing the wide spread of interest rates of banks in 36 Central and Eastern and Western European countries from 1991 to 2001. the study did a systematic comparative analysis on 2000 banks. The results from the empirical analysis indicates that capital adequacy, the level of efficiency, the operative efficiency and risk management were the main determinants of wide interest rate spreads in those countries. The study further indicated that institutional regulations are likely to cause risky bank behavior initially, which is made evident in higher lending rates.

Gambacorta (2004) studied how banks set interest rates in the Italian banking system. The study employed a panel regression analysis using quarterly series from the period 1993:3 to 2001:3 on 73 banks. The study used variables such as the monetary policy rate and reserve requirements as proxies for monetary policy, loan and deposit demand, the industrial structure, interest rate volatility, operating costs, bank size, inflation, real GDP and credit risk. The study found that interest on short term loans are less sensitive to monetary policy. Also interest rate spread is not influenced by the size of banks. However, inflation and real GDP are positively related to lending rate but inversely related to the deposit rates after controlling for any differences in the banks specific characteristics. Higher credit risk and operating cost increases the cost of financial

intermediation which then results into higher lending rates, this is because banks may attempt to recover some of their costs.

Georgievska et al. (2011) studied the factors influencing lending rates and interest rate spreads using panel data estimation method. The study sampled 17 banks for the period spanning from 2001 to 2009. The study modelled lending rates and interest rate spread as a function of deposit rate, vector of bank specific factors such as total assets, non-performing loans, liquidity, capital adequacy, operating costs, return on assets, the share of foreign capital and market share, and macroeconomic factors captured by the 3 month EURUBOR rate and the interest on central bank's bill. The study found that factors that affect lending rates include total assets, market share, deposit rates and non-performing loans. The study further identified policy variables like domestic monetary policy rate and foreign interest rate as important variables that can affect bank's lending rate.

Mbao et al (2014) analyzed the factors that are likely to influence lending rates in Zambia. The study made use of the panel estimation technique on bank specific variables from 2005 to 2013. The variables include capital adequacy, liquidity, non-performing loans, deposit rate, return on assets, market share, wholesale funding cost, operation cost, provision for loan losses, corporate income tax, deposits, statutory reserve ratio and macroeconomic variables like inflation, credit growth and treasury bill rate. The results indicated that variables that relates to bank's cost and inflation impacts positively on the lending rates.

Beck and Hesse (2006) investigated the determinants of interest rate spread in Uganda based on dataset spanning from 1999 to 2005. The study used bank specific factors, macroeconomic and banking system factors and employed the pooled Ordinary Least Squares (OLS) and the fixed effects regression. The study found evidence that most of the variations in interest rate spread can be attributed to bank-level factors such as banks' overhead costs, composition and size of loan portfolio. Macroeconomic factors on the other hand, had very little influence on the spread of interest rates.

2.2.2 Studies on Ghana

Bawumia et al. (2005) evaluated the impact of market determinants and policy related factors on interest rate spreads in Ghana using monthly data spanning from 2000:1 to 2004:4. The study employed the generalized least squares estimation technique. The study found that high operating cost which is as a result of high labour cost, cross subsidization between interest and non-interest income, market share (which measures the competition in the banking industry), inflation, liquidity reserves and taxes have a very important effect on the spread in interest rates.

Aboagye et al. (2008) assessed the responsiveness of interest rate spreads to bank specific characteristics and macroeconomic factors based on the Ho and Saunders theory. The study indicated that factors such as the bank size, staff and administrative cost, inflation, market power and the degree of risk aversion, impact on the spread positively, while the Bank of Ghana's lending rate, excess reserves of the banks and management efficiency affect the spread negatively. The study further recommends policies to reduce the capital adequacy ratio and also to ensure the

reduction is adequately passed on to consumers. Also banks should not get too big, to ensure efficient competition in the financial sector.

Garr and Kyereboah-Coleman (2013) studied interest rates in Ghana based on bank specific factors, industry specific and macroeconomic factors. The study used annual time series data from 1990 to 2010 on 33 commercial banks and an unbalanced panel data analysis. The results submit that factors such as GDP per capita, bank ownership, management inefficiency and Government securities have a positive effect on the interest rate spread. However, Government borrowing negatively influence the spread. The study further indicated domestic banks have a wider spread than their foreign counterparts, suggesting the domestic banks are likely to be less efficient than the foreign banks.

Sherriff and Amoako (2014), assessed the macroeconomic determinants of interest rate spread using the ARDL cointegration technique and the Vector Error Correction model. The study based the analysis on monthly data series for the period 1999:1 and 2010:12. The study modeled interest rate spreads as a function of macroeconomic indicators; inflation, treasury bill rates, the total banking sector deposits, and public sector domestic borrowing. The study found that high interest rate spreads are positively influenced by total deposit, inflation, government borrowings but negatively influenced by treasury bills.

Churchill et al. (2014) assed interest rate spreads in Ghana using both exploratory and explanatory (the Multiple Regression Model Pearson's Correlation) studies. The study employed data set from between 2004 to 2012. The study included variables such as loan loss provision, monetary policy rate, profit margins, liquidity, overhead cost, exchange rate, inflation, treasury bill rate and real

GDP per capita. The result showed that exchange rate, liquidity, GDP per capita, overhead cost, Prime rate, profit margin loan loss provision influence interest rate spread significantly.

2.3 Conclusion

The empirical evidence showed that less emphasis has been placed on the determinants of lending rates and more especially the paucity of studies in Ghana. This gap provokes much interest to investigate the possible factors that influences the ever growing lending rates in Ghana.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter explains the method employed in achieving the stated objectives. The chapter is organized into three sections. The first section presents a discussion on specification of the model and a priori expectations on the signs of the coefficients of the variables. The next section presents the details of the estimation strategy adopted to ensure the robustness of results. Finally, the last section describes the data, variable measurements and sources of data.

3.1 Model Specification

In assessing the determinants of lending rates from the macroeconomic perspective in Ghana, the study specifies an empirical model following Gambacorta (2004) and Sherriff and Amoako (2014) to specify lending rates as a function of the Monetary Policy rate, development of the financial sector, inflation and Trade Openness. This may be expressed as;

$$LR_t = f(MPR_t, FD_t, INF_t, TO_t) \quad (3.1)$$

Where *LR* represents lending rates, *MPR* represents the Monetary Policy rate, *FD* represents Financial Development, *INF* represents the Inflation rate and *TO* represents the level of trade openness in the economy. From equation (3.1), Lending rates which is the dependent variable in the study is expressed as a function of Monetary Policy rate, financial development, inflation and Trade Openness, which are the independent variables. Equation (3.1) can be expressed in an explicit parametric regression model as;

$$LR_t = \beta_0 + \beta_1 MPR_t + \beta_2 FD_t + \beta_3 INF_t + \beta_4 TO_t + \varepsilon_t \quad (3.2)$$

Where β_0 is the intercept and β_1, β_2 , $\beta_3$and β_4 are the coefficients of Monetary Policy rate, financial development, inflation and Trade Openness variables respectively.

The estimable model is expresses in a logarithm form as;

$$\ln LR_t = \beta_0 + \beta_1 \ln MPR_t + \beta_2 \ln FD_t + \beta_3 \ln INF_t + \beta_4 \ln TO_t + \varepsilon_t \quad (3.3)$$

The log form ensures the elimination of possible outliers as well as large coefficients. The interpretation of the coefficients also gives elasticities. Elasticities are of significance as it would bring to bear the actual responses of lending rates to changes in the Monetary Policy rate, financial development, inflation and Trade Openness variables at any point in time.

From equation (3.3) expects a positive relationship between lending rates and the Monetary Policy rate and the rate of Inflation. This indicates that as the cost of borrowing from the central bank increases, banks respond by increasing the rate on loans to their customers, this is because the amount of money available for loans may be altered (Folawewo and Tennant, 2008). Similarly, as prices increases, banks tend to charge higher rates on loans in order not to lose the value of the loans they give out (Demirguc-Kunt and Huizinga, 1998).

However, Financial Development and Trade Openness are expected to be negatively related to lending rates. Thus as the financial sector develops, competition in the financial markets is able to reduce the rates of borrowing from the banks.

3.2 Types and Sources of Data

The study employed secondary data sources for the analysis. Annual time series data spanning from 1980 to 2015 was used for the analysis. In the exception of lending rates that was obtained from the Bank of Ghana, data on all the other variables were sourced from the World Bank's World

Development Indicators (WDI, 2016). The study analyzed lending rates (dependent variable) as a function of four independent variables; the Monetary Policy rate, Financial development, Inflation rate and Trade Openness.

3.3 Variable Description

3.3.1 Dependent Variable

Lending Rate (LR)

Lending rate is the amount (usually expressed in percentage) by banks on the loans they give out to their customers. Lower levels of the rate of borrowing encourages the borrowing for business expansion and also for domestic consumption. Thus lower lending rates stimulates investments in the domestic economy and ultimately may boost economic growth. High lending rates may have the opposite effect in the economy. Lending rate which is the dependent variable in the model is measured as the annual lending rate expressed in percentages following Saunders and Schumacher (2000) and Georgievska et al. (2011).

3.3.2 Independent Variables

Monetary Policy Rate (MPR)

The Monetary Policy Rate (MPR) is used as a proxy for interest rate as it is the official monetary policy tool used predominantly by the Bank of Ghana and also as a priced based monetary policy variable. The MPR is the rate at which commercial banks can borrow from the Central Bank and thus expected to communicate the stance of monetary policy which serves as a guide for all other market interest rate. It is usually set at the level which is consistent with achieving the BOG's inflation target. And this policy rate has evolved through different policy regimes (Bank of Ghana, 2015). The MPR is included in the model following Gambacorta (2004).

Financial Development (FD)

Financial development measures the efficiency in the financial system in the performance of financial intermediary. It captures the various factors, policies and institutions that ensures intermediation in the financial market is done efficiently. The study measures Financial development as the ratio of total credit to the private sector to GDP following Adu, Marbuah and Mensah (2013).

Inflation

Inflation refers to the persistent or sustained increase in the general price level in an economy over a period of time. Increasing prices reflects a fall in the purchasing power of the currency. The Consumer Price Index (CPI) is used as it is the measure used mainly by the Ghana Statistical Service as a measure of inflation and it is also able to capture nominal price changes in the economy. The CPI is used with reference to price levels in 2010 as the base year (CPI 2010 =100) (Ghana Statistical Service, 2015).

Trade Openness

Trade openness shows the ability of a country to take advantage of trade opportunities with other countries. It also captures countries' inability to take hold of prospects to trade with other economies. It captures the importance of trade on the domestic interest rate. The study measures Trade openness as the ratio of the sum of exports and imports to GDP following Hassan, Sanchez and Yu (2011) and Adu, Marbuah and Mensah (2013).

3.3 Estimation Technique

In using time series data for the analysis, preliminary tests on the variables are very important to make sure the estimated parameters from the specified model are consistent. First the study examines the stationarity properties of all the variables in the study to ensure that the estimated results are not spurious. The study then tests for any long run relationship among the variables using the Autoregressive Distributed Lag (ARDL) Bounds testing approach. The ARDL estimation technique is employed to estimate the short run and long run parameters.

3.3.1 Stationarity Test

Most time series data usually rise or fall and more often are likely to be trended, necessitating the need to examine the stationarity properties of the variables. Testing the order of integration of the variables is very useful in the specification of the model in order to avoid the possibility of spurious relationships in the analysis. The study will use the Augmented Dickey-Fuller and the PhilipPerron tests for the stationarity test.

3.3.1.1 Augmented Dickey- Fuller (ADF) Test

The ADF test is the modified and improved version of the Dickey-Fuller test. Because the DF test assumed that the error terms should be uncorrelated and white noise, the ADF was developed for situations where the error terms may be correlated, this follows the idea that most macroeconomic variables may be correlated and also usually trended (Asteriou and Hall, 2011). The ADF test adds extra lagged terms of the dependent variable to the equation and thus able to do away with autocorrelation problem. A simple ADF stationarity test may be specified as;

p

$$\Delta X_t = \alpha_1 + \alpha_2 t + \alpha_3 X_{t-1} + \sum_{i=1}^{} \beta_i \Delta X_{t-i} + \varepsilon_t \quad (3.4)$$

Where X represents the time series variable, t is the time/trend variable, α_1, α_2 and α_3 are the estimated parameters, Δ is the first difference operator, β_i is the various estimated parameters of the differenced values of the lagged variables and ε_t is the white noise error term. From equation (3.4) the study tests the null hypothesis of the presence of unit root ($\alpha_3 = 0$) against the alternative hypothesis of no unit root. The series is stationary if the study rejects the null hypothesis. Should the study fail to reject the null hypothesis then the series possesses a unit root and thus nonstationary.

3.3.1.2 Philips-Perron (PP) Test

The PP test was advanced by Philips- Perron (1988) as a more robust test for the stationarity of time series data. It modifies the ADF test by making non-parametric modification to the test statistics which is able to correct for the possibility of autocorrelation and heteroscedasticity in the error terms. It is also able to make sure that the deviations are white noise in the estimated regression. A simple PP test may be expressed as;

$$\Delta X_{t-1} = \alpha_0 X_{t-1} + \varepsilon_t \quad (3.5)$$

From equation (3.5), the study tests the null hypothesis of the presence of unit root ($\alpha_0 = 0$), against the alternative hypothesis of no unit root. The series possess a unit root if the study fails to reject the null hypothesis. On the other hand, the series is stationary if the null hypothesis is rejected.

3.3.3 Autoregressive Distributed Lag (ARDL) Model

The ARDL estimation technique is employed to examine the short run and long run effects of the Monetary Policy rate, financial development, inflation and Trade Openness on lending rates in Ghana. The ARDL is preferred because of its numerous advantages; first, Pesaran et al (2001) noted that it can be applied to time series data irrespective of whether the series are stationary at first difference I~(1) or at the levels I~(0), or a mixture of both. Also, it is suitable for a small sample size analysis and also more flexible because it can be used even when the order of integration of the variables are not known before the cointegration test.

A general ARDL model may be expressed as;

$$\Delta Y_t = \alpha_o + \alpha_0 Y_{t-1} + \alpha_1 X_{t-1} + \alpha_2 Z_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \sum_{i=0}^{p} \beta_j \Delta X_{t-j} + \sum_{i=0}^{p} \delta_k \Delta Z_{t-k} + \varepsilon_t \quad (3.7)$$

From equation (3.7), Y is the dependent variable, X and Z are the independent variables in the model. α, β, δ are the coefficients to be estimated and ε is the IID error term. From the general ARDL model in equation (3.7), the ARDL model for the study can be specified as;

$$\Delta \ln LR_t = \alpha_o + \alpha_0 \ln LR_{t-1} + \alpha_1 \ln MPR_{t-1} + \alpha_2 \ln FD_{t-1} + \alpha_3 \ln INF_{t-1} + \alpha_4 \ln TO_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \ln LR_{t-i} + \sum_{i=0}^{p} \beta_i \Delta \ln MPR_{t-i} + \sum_{i=0}^{p} \gamma_i \Delta \ln FD_{t-i} + \sum_{i=0}^{p} \delta_i \Delta \ln INF_{t-i} + \sum_{i=0}^{p} \theta_i \Delta \ln TO_{t-i} + \varepsilon_t \quad (3.8)$$

From equation (3.8) the ARDL bounds test can be employed to establish the existence of any long run relationship among the variables.

3.3.3.1 ARDL Bounds Testing Approach

The ARDL bounds test for cointegration (long run equilibrium relationship) is established from the overall test of significance of the lag of all the variables in their levels form. The study thus tests the significance of the F-statistic. From equation (3.8), the study tests the hypothesis of the existence of no long run equilibrium relationship against the alternative hypothesis of the presence of a long run equilibrium relationship among the variables.

H_0: □ □ □ □ □$_0$ □ □ □ □$_1$ $_2$ $_3$ $_4$

H_1: □ □ □ □ □$_0$ □ □ □ □$_{12}$ $_3$ $_4$

The study then compares the estimated F-Statistic value to the lower and upper bounds critical values generated by Pesaran et al (2001); the lower bound values are generated on the assumption that all the variables are integrated of order zero; I~(0), while the upper bound is by the assumption that all variables are integrated of order one; I~(1). The null hypothesis is rejected if the F-statistic falls above the upper bound; this indicates the existence of a long run equilibrium relationship among the variables. If, the F-statistic falls below the low bound, then the study fails to reject the null hypothesis, thus there is no long run relationship among the variables.

3.3.3.2 The Short run and Long run Estimates from the ARDL Model

Because the ARDL model specifies both the long run and short run impact of the independent variables on the dependent variables, the study can estimate the long run coefficients after a long run relationship has been established among the variables.

$$\Delta Y_t = \alpha_{o0} Y_{t-1} + \beta_1 X_{t-1} + \beta_2 Z_{t-1} + \varepsilon_t \quad (3.9)$$

From equation (3.10) the long run coefficients; α_0, α_1,α_2, α_3 and $\alpha_4$are generated.

The short run dynamics coefficients from the model may be expressed by finding the error correction model associated with the long run estimates. Thus from equation (3.8), the short run regression model may be expressed as,

$$\Delta \ln LR_t = \alpha_o + \sum_{i=1}^{p} \beta_i \Delta \ln LR_{t-i} + \sum_{i=0}^{p} \gamma_i \Delta \ln MPR_{t-i} + \sum_{i=0}^{p} \delta_i \Delta \ln FD_{t-i} + \sum_{i=0}^{p} \theta_i \Delta \ln INF_{t-i} + \sum_{i=0}^{p} \lambda_i \Delta \ln TO_{t-i} + \phi E_{t-1} + \varepsilon_t \quad (3.10)$$

Where E_{t-1} shows the error correction factor and ϕ represents the speed of adjustments. β_i , γ_i , δ_i , θ_i and λ_i are the short run parameters to be estimated. From equation (3.10), the error correction tells the speed of adjustment of the variables to the long run equilibrium, should there be any disequilibrium. The error correction factor is thus expected to be negative and significant. The negative suggest that with any deviation from the long run, the variables would return to equilibrium. On the contrary, a positive error correction term indicates an explosive state, thus the possibility that the variables may not return to its equilibrium point.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The chapter presents the results and analysis. It devoted to the discussion on the descriptive statistics of the variables employed in the model, trend analysis and stationarity properties of the variables. It further presents the discussion on the long-and short-run estimates from the analysis.

4.1 Descriptive Statistics

Table 4.1 provides the description of the characteristics and properties of the variables in the model. This brings to bear the variability and setting of the data of the variables.

Table 4.1 Summary of descriptive Statistics

Variables	Mean	Maximum	Minimum	Std. Dev.	Observations
lnLR	3.3343	3.8501	2.9444	0.2542	36
lnMPR	3.0710	3.8066	2.3513	0.3882	36
lnFD	1.9662	3.0092	0.4332	0.7889	36
lnTO	3.9728	4.7540	1.8437	0.7180	36
lnCPI	2.1313	5.1886	-2.8056	2.288	36

Source: Author's Estimation (2016)

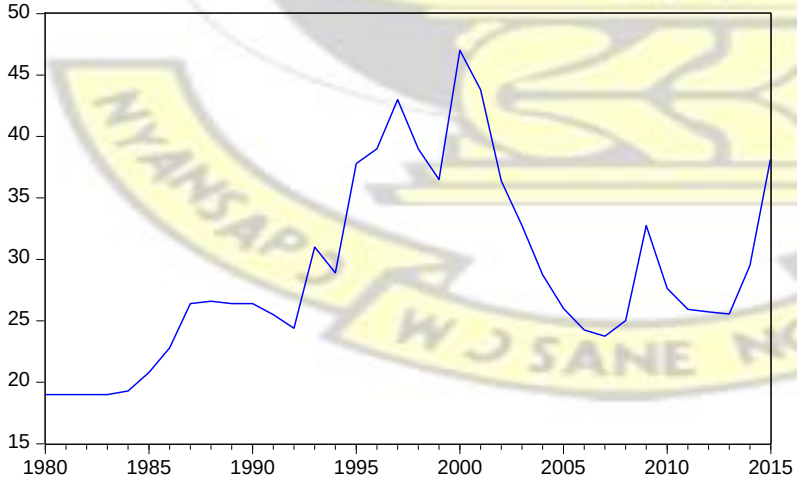
The statistics from Table 4.1 is based on 36 annual observations from 1980 to 2015. Over the study period, Lending rate (LR) which is the dependent variable ranged between a maximum value of 3.85 and a minimum value of 2.94, with an average of 3.33. It recorded the lowest standard deviation of 0.25, indicating that the data cluster closely around the average. The Monetary Policy

Rate (MPR) has a mean of 3.07, with sample ranging between 3.80 and 2.35. MPR recorded a standard deviation of 0.38 which is the second lowest in the series. Financial development; which was measured by the credit to the private sector, recorded the lowest mean of 1.96, but had the highest standard deviation of 0.786 and a minimum and maximum value of 0.43 and 3.01 respectively. Trade openness obtained also obtained the highest mean value of 3.97 and also the second highest standard deviation of 0.71, a minimum value of 1.84 and a maximum value of 4.75. Prices (CPI) recorded a maximum value of 5.18 (the highest among the series) and a minimum value of -2.80 (also the lowest among the series); it is not surprising that it recorded the highest standard deviation of 2.28; because of the wide gap between the maximum and the minimum value. It also had a mean of 2.13.

4.2 Trends in Lending Rates in Ghana

The analysis of trends in the lending rate is important as it brings out the path it has taken over the sample period. It seeks to uncover the peaks and troughs in the trends as well as the behavior of the lending rate with time. The trend is presented in Figure 4.1;

Figure 4.1: Trends in Lending Rates in Ghana



Source: Author's Construct (2016)

From Figure 4.1, the lending rates in Ghana have been volatile over the study period. Lending rates in the early 1980's were relatively lower (below 20%) but has however been increasing since the mid-1980, with some spikes along the trend, averaging approximately 28.7% during the period of the study. The economy witnessed a significant decline between the years 2000 and 2007, with the highest rate been 47% in 2000 in and the lowest been 19% in from 1980 to 1983. The lending rates has been relatively high as compared to other African countries and has been ranked as one of the countries with the highest lending rates in the world, ranked third after Argentina and Malawi (Ghana talks Business, 2016). This high rates may be attributed to the desire by successive governments to borrow from the banks. this has the tendency to increase the demand for loans and ultimately raising the price of loans.

4.3 Stationarity Results

Testing the stationarity properties of time series variables is important before proceeding to do any form of analysis because most time series variables have the tendency to fluctuate over time and therefore may produce spurious results if the stationarity properties are not known. The stationarity test results are presented in Table 4.2.

The result from both the ADF and the PP tests for the two models; the model with only constant term and the model with both a constant term and a trend, indicates that the series are not stationary at levels. The study rejects the null hypothesis of the presence of unit root at 5% significance level for all the variables whether they have trends or not at levels.

Table 4.2: Stationarity test results

Variable	ADF test		PHILIP-PERRON test		ORDER OF INTEGRATION
	CONST	CONST + T	CONST	CONST + T	
PANEL A: LEVELS					
lnLR	-1.6336	-1.6928	-1.6336	-1.7578	-
lnMPR	-1.9384	-2.0096	-1.9114	-1.9669	-
lnFD	-1.2046	-2.4743	-2.7227	-0.7161	-
lnTO	-2.9209*	-2.8083	-1.3975	-1.6795	-
lnCPI	-3.455*	-1.6009	-4.979*	-3.0147	-
PANEL B: FIRST	**DIFFERENCE**				
Δ lnLR	-5.043***	-4.943***	-5.043***	-4.943***	I(1)
Δ lnMPR	-6.775***	-6.628***	-6.718***	-6.581***	I(1)
Δ lnFD	-5.890***	-5.959***	-7.980***	-11.38***	I(1)
Δ lnTO	-6.097***	-7.634***	-4.814 ***	-5.036***	I(1)
Δln*CPI*	-3.545**	-4.420***	-5.618***	-12.97***	I(1)

Note: *, **, * indicates significance at 1%, 5% and 10% respectively**

Source: Author's Estimation (2016)

However, the study failed to reject the null of the presence of unit root after the variables were differenced once. Thus all the variables became stationary at first difference at 1% significance level. Making all the variables integrated of order one; I(1).

4.4 ARDL Bounds Test Cointegration Results

The test for the existence of a long-run equilibrium relationship among the variables was conducted using the ARDL bounds test. The result from the test is presented in Table 4.3

Table 4.3: Results of Bounds test cointegration

		Critical Values	
F-Statistic	**Significance**	**Lower bound**	**Upper Bound**
	10%	2.45	3.52
7.9414***	5%	2.86	4.01
	1%	3.74	5.06

Note: * implies rejection of the null hypothesis at 1% level of significance.**

Source: Author's Estimation (2016)

The result from the bounds test with a maximum lag length of 2 (based on the Akaike info criterion) generated from the ARDL model (1,1,2,2,1) indicated that there exists a long run equilibrium relationship among the variables at a 1% level of significance. Specifically, the computed Fstatistic for the model (7.9414) is greater than the critical upper bound values of 3.52, 4.01 and 5.06 at 10%, 5% and 1% significance levels respectively. The F-statistic been greater than the critical upper bound values in the model confirms a stable long run relationship exit among the variables.

4.5 Results from the Long Run Estimates

To assess the impact of macroeconomic variables on lending rates in Ghana, the study tests the long run impact of the Monetary Policy Rate, Financial Development, inflation and Trade Openness on lending rates. The results are presented in table 4.4.

Table 4.4: Estimated long-run result

Dependent variable: LR			
Variables	**Coefficient**	**Std. Error**	**t-statistics**
MPR	0.644991	0.102811	6.2735***
FD	-0.829826	0.204885	-4.0501***
TO	-0.2390	0.126604	-1.8880*
CPI	0.138531	0.053037	2.6119**
C	0.897280	0.223387	4.0167***

Note: *, **, * indicates significance at 1%, 5% and 10% respectively**

Source: Author's Estimation (2016)

The result shows that MPR and CPI has a positive relationship with lending rate in the long run whiles Financial development and Trade openness had a negative impact on lending rate. Specifically, a 1% increase in MPR will cause the lending rates to increase by 0.645% in Ghana. This positive and significant impact of MPR on lending rates is consistent with the prior expectations and also confirming the findings of Georgievska *et al*. (2011) in Europe and Churchill et al. (2014) in Ghana. Perhaps, this is because the MPR is the most widely monetary policy variable used by the Bank of Ghana, and it also reflect the cost of commercial banks borrowing from the Bank of Ghana, thus an increase in the cost of borrowing by the commercial banks would translate in higher cost of borrowing from the banks in the long run.

Similarly, a 1% increase in Financial development variable causes lending rates to decrease by 0.829%. this indicates that when financial development increases; credit available to the private sector increases, it has a negative and significant impact on lending rates in the long run. It however, confirm the prior expectation of a negative relationship following McKinnon and Shaw (1973). Thus in the Ghanaian banking sector, improving financial development by increasing the total credit to the private sector reduces lending rates in the long run.

Trade openness though negative (meeting the prior expectation), had no significant direct influence on lending rate in Ghana in the long run (only significant at 10% significance level). This insignificant impact can be attributed to Ghana's over dependency on imports of consumer goods at the expense of investment goods. In this case, funds for these consumer goods may not be necessarily be obtained from the commercial banks because most importers of consumer goods are not able to meet the financial requirements of the commercial banks in other to obtain loans to finance their imports. Furthermore, the commercial banks are less willing to provide loans to finance the importation of consumer goods because of the riskiness of these businesses and the unlikely of repayments of these loans. Thus trade may not necessarily mean people rely on loans from the domestic banks to finance import.

Inflation, measured by the Consumer Price Index as expected has a positive and significant influence on lending rates in Ghana in the long run. Thus a 1% increase in prices will cause lending rate to increase by 0.33%. This confirms the study of Gambacorta (2004) in the Italian banking system, Mbao *et al* (2014) in Zambia and Bawumia *et al*. (2005) and Sherriff and Amoako (2014) in Ghana. The increasing trends in the lending rates in Ghana according to Bawumia (2005) and Kwakye (2010) has been the insatiable desire of banks to safeguard the real value of their loans.

4.6 Result from the Short Run Estimates

The short run analysis with an error correction model (ECM) term incorporated is estimated within the ARDL framework. It tells the immediate effect of MPR, Financial development, trade openness and on lending rate. The ECM determines the speed of adjustment to return to equilibrium when there is any deviation. As a priori, the coefficient of the ECM is supposed to be negative and statistically significant for the variables to converge to equilibrium.

Table 4.5: Estimated short-run results

Variables	Coefficient	Std. Error	t-statistics
D MPR( )	0.280591	0.103387	2.71400**
D TO( )	-0.036932	0.107231	-0.34442
DTO( )$_{-1}$	0.188524	0.089047	2.11712**
D FD( )	0.275128	0.121039	2.273051**
DFD( )$_{-1}$	-0.248168	0.116722	-2.12613**
D CPI( )	0.334593	0.198380	1.686625
ECM_{-1}	-0.843759	0.160412	-5.2599***

Note: *, ** indicates significance at 1% and 5% respectively**

Source: Author's Estimation (2016)

From the result in Table 4.5 the coefficient of the ECM is negative and significant and thus confirms the existence of the long run equilibrium relationship amongst the variables in the cointegration test and also indicates the estimated model is stable. It thus shows how the variables in the model converge to a long run equilibrium after a shock in the short run. The result indicates equilibrium in the long run will adjust by approximately 84% after a short run shock, which depicts

a very high speed of adjustment in the long run. This high speed of adjustment may be an indication that it takes a very short time for lending rate to adjust when there is a shock.

The short run result shows that MPR had a positive and significant impact on lending rates. Thus a 1% increase in MPR will cause the rate of lending to increase by 0.28% in the short run. This positive impact is consistent with the long run relationship. Similarly, Financial Development has shown to also have a positive and significant impact on lending rates in the long run, similar to the long run. Lending rate increases by 0.27% when Financial development increases by 1% in the short run; this did not meet the prior expectation and also contradict the long run relationship. The lag of financial development in the model was however negative and significant as expected. Prices, subsequently met the prior expectation, just like the MPR. Thus a 1% increase in prices will cause the lending rates to increase by 0.13% in the short run. An increase in prices will cause banks to increase the rate of lending to their customers in both the short and long run.

Trade openness in the short run had a negative but an insignificant impact on lending rate in the short run. This is also consistent with the long run, indicating that trade does not have any influence on the domestic lending rates in both the short and long run. This insignificant influence of trade in the short run is probable because the large informal sector indicates the tendency for people to rely on informal sources of funding trade and thus may have little relationship with the formal banks. However, the lag of Trade Openness was positive and significant.

4.7 Diagnostic and Stability Tests

To ensure the robustness of the outcomes of the results, it is important to ensure the stability, the correct functional form of the model was specified and the avoidance of serial correlation and heteroscedasticity. The test statistics for the various test is expected to be statistically insignificant to ensure the absence of these econometric problems. The result of the diagnostic and stability test are presented in Table 4.6

Table 4.6: Diagnostic and Stability test results

Test	F- statistic	Prob. Values
Serial Correlation	0.864179	0.4365
Heteroscedasticity	0.781506	0.6552
Normality	0.2633	0.8766
Functional Form	1.29688	0.7001
CUSUM	Stable	-
CUSUMQ	Stable	-

Source: Author's Estimation (2016)

From Table 4.6, the test of serial correlation based on the Breusch-Godfrey Serial Correlation LM test among the residuals confirms the absence of serial correlation since the F-Statistic was statistically insignificant. The test of Heteroscedasticity based on the Breusch-Pagan-Godfrey test also reported a statistically insignificant F-statistics, thus indicating the absence of heteroscedasticity among the error terms.

The Ramsey-reset stability test results also shows that the models have no issues with the functional form and thus a correct model has been specified. Also the normality test based on the Jacque-Bera test indicates the variables are normally distributed. Both the CUSUM and the CUSUM squares further indicate the estimated model was stable.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter gives a conclusion of the study by presenting the summary of major findings. And also provides recommendations based on the findings.

5.1 Summary

The study basically sought to investigate the macroeconomic determinants of lending rates in Ghana. By specifically assessing the impact of macroeconomic variables such as the Monetary Policy Rate, Financial Development (measured by the ratio of credit to the private sector), inflation and Trade Openness on the lending rate in Ghana. Annual time series data from 1980 to 2015 and the ARDL econometric technique was employed for the study.

The result from the estimation indicates that the Monetary Policy rate, as expected, had a positive and significant effect on lending rates in Ghana. in both the short run and the long run. Indicating that an increase in the rate at which banks acquire funds from the Bank of Ghana, will be translated into an increase in the rates at which banks lend to their customers.

Financial development was found to have a negative impact on lending rates in the long run whereas a positive relationship in the short run Ghana. The short run result further showed that, the lagged coefficient of Financial development had a negative and significant impact on lending rates.

The results also revealed that Inflation measured by the Consumer Price Index had a positive impact on lending rates in the short run and the long run. That is, rising prices will be translated adequately into higher lending rates to customers. Banks have the tendency to increase the lending rates during periods of inflation to protect the real value of the loans given out,

Finally trade openness had an insignificant (though negative) impact on the lending rates in both the short and long run. Indicating the possibility that trade financing in Ghana is not financed by borrowings from the bank. The lagged trade openness was however, negative and significant.

5.2 Conclusions

The study had the primary objective of examining the macroeconomic determinants of lending rates in the commercial banks in Ghana. The study reviewed various theoretical and empirical literatures and found out that not much emphasis has been given to the determinants of lending rates in Ghana. the study found evidence that, MPR and Inflation has positive drivers of the high lending rates in the economy. The study also found evidence that developing the financial sector will bring down the lending rates in the long run.

5.3 Recommendations

Based on the findings the study, MPR plays an important role in driving higher lending rates in the Ghanaian economy in both the short and long run. The study thus recommends policies by monetary authorities to stabilize the MPR so that the adverse impact of higher MPR on lending rates may be reduced. Specifically, authorities should implement policies that will aid reduce the MPR.

Financial development, measured by the total credit to the private sector, has a significant positive influence on lending rates in the short run but negative relationship in the long run in the Ghanaian economy. Thus, measures should be implemented to improve access to affordable credit made available to the private sector because of its tendency to reduce lending rate in the long run.

Inflation based on the findings had contributed significantly to driving high lending rates, thus various governments and policy makers should implement policies that adequately reduces or stabilizes inflation in the economy. The study further recommends policy makers should not place more emphasis on trade openness with regards to reducing the lending rates in the banking industry.

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APPENDIX

TABLE A: ARDL BOUNDS TEST

ARDL Bounds Test
Date: 09/18/16 Time: 23:15
Sample: 1982 2015
Included observations: 34

Test Statistic	Value	K
F-statistic	7.941480	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Null

Test Equation:
Dependent Variable: D(LNLR)
Method: Least Squares
Date: 09/18/16 Time: 23:15
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNMPR)	0.280591	0.103387	2.714004	0.0127
D(LNTO)	-0.036932	0.107231	-0.344421	0.7338
D(LNTO(-1))	0.188524	0.089047	2.117122	0.0458
D(LNFD)	0.275128	0.121039	2.273051	0.0331
D(LNFD(-1))	-0.248168	0.116722	-2.126135	0.0450
D(LNCPI)	0.334593	0.198380	1.686625	0.1058
C	0.757088	0.244461	3.096971	0.0053
LNMPR(-1)	0.544217	0.093111	5.844838	0.0000
LNTO(-1)	-0.201684	0.092848	-2.172185	0.0409
LNFD(-1)	0.700173	0.179799	3.894206	0.0008
LNCPI(-1)	-0.116887	0.047456	-2.463067	0.0221
LNLR(-1)	-0.843759	0.160412	-5.259951	0.0000

Hypothesis: No long-run relationships exist

R-squared	0.761974	Mean dependent var	0.020618
Adjusted Rsquared	0.642961	S.D. dependent var	0.126364
S.E. of regression	0.075506	Akaike info criterion	-2.058650
Sum squared resid	0.125425	Schwarz criterion	-1.519935

Log likelihood	46.99706	Hannan-Quinn criter.	-1.874933
F-statistic	6.402446	Durbin-Watson stat	2.306193
Prob(F-statistic)	0.000115		

TABLE B ARDL MODEL FOR SHORT AND LONG RUN ESTIMATES

ARDL Cointegrating And Long Run Form
Dependent Variable: LNLR
Selected Model: ARDL(1, 1, 2, 2, 1)
Date: 09/18/16 Time: 22:54
Sample: 1980 2015
Included observations: 34

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNMPR)	0.280591	0.103387	2.714004	0.0127
D(LNTO)	-0.036932	0.107231	-0.344421	0.7338
D(LNTO(-1))	0.188524	0.089047	2.117122	0.0458
D(LNFD)	0.275128	0.121039	2.273051	0.0331
D(LNFD(-1))	-0.248168	0.116722	-2.126135	0.0450
D(LNCPI)	0.334593	0.198380	1.686625	0.1058
CointEq(-1)	-0.843759	0.160412	-5.259951	0.0000

Cointeq = LNLR - (0.6450 *LNMPR -0.2390 *LNTO + 0.8298*LNFD -0.1385 *LNCPI + 0.8973)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNMPR	0.644991	0.102811	6.273557	0.0000
LNTO	-0.239030	0.126604	-1.888019	0.0723
LNFD	-0.829826	0.204885	-4.050196	0.0005
LNCPI	0.138531	0.053037	2.611990	0.0159

C	0.897280	0.223387	4.016706	0.0006

DIAGNOSTIC TESTS

TABLE C: AUTOCORELATION

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.864179	Prob. F(2,20)	0.4365
Obs*R-squared	2.704491	Prob. Chi-Square(2)	0.2587

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/18/16 Time: 23:47
Sample: 1982 2015 Included observations: 34

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNLR(-1)	0.130775	0.191336	0.683483	0.5021
LNMPR	-0.014480	0.105084	-0.137791	0.8918
LNMPR(-1)	-0.051310	0.128990	-0.397782	0.6950
LNTO	-0.050128	0.117323	-0.427262	0.6738
LNTO(-1)	0.061020	0.154439	0.395104	0.6969
LNTO(-2)	-0.028247	0.095582	-0.295529	0.7706
LNFD	0.065108	0.134069	0.485626	0.6325
LNFD(-1)	-0.018670	0.106046	-0.176057	0.8620
LNFD(-2)	-0.039237	0.121230	-0.323658	0.7496
LNCPI	0.085230	0.216163	0.394285	0.6975
LNCPI(-1)	-0.089192	0.228254	-0.390757	0.7001
C	-0.193143	0.287474	-0.671864	0.5094
RESID(-1)	-0.385710	0.302419	-1.275412	0.2168
RESID(-2)	-0.219594	0.267753	-0.820137	0.4218

R-squared	0.079544	Mean dependent var	-4.20E16
Adjusted Rsquared	0.518753	S.D. dependent var	0.061650

S.E. of regression	0.075976	Akaike info criterion	-2.023889
Sum squared resid	0.115448	Schwarz criterion	-1.395388
Log likelihood	48.40612	Hannan-Quinn criter.	-1.809552
F-statistic	0.132951	Durbin-Watson stat	2.030801
Prob(Fstatistic)	0.999712		

TABLE D: STABILITY TEST

TABLE E: HETEROSCEDASTICITY

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.781506	Prob. F(11,22)	0.6552
Obs*R-squared	9.552811	Prob. Chi-Square(11)	0.5710
Scaled explained SS	4.858061	Prob. Chi-Square(11)	0.9378

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/18/16 Time: 23:48
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008882	0.019623	-0.452640	0.6552
LNLR(-1)	-0.008420	0.012877	-0.653874	0.5200
LNMPR	0.000568	0.008299	0.068400	0.9461
LNMPR(-1)	0.005961	0.009688	0.615305	0.5447
LNTO	0.007674	0.008608	0.891559	0.3823
LNTO(-1)	-0.010226	0.011230	-0.910597	0.3724
LNTO(-2)	0.002626	0.007148	0.367414	0.7168
LNFD	0.003957	0.009716	0.407309	0.6877
LNFD(-1)	0.014337	0.008375	1.711773	0.1010

LNFD(-2)	-0.001729	0.009370	-0.184486	0.8553
LNCPI	-0.005822	0.015924	-0.365586	0.7182
LNCPI(-1)	0.000368	0.016757	0.021939	0.9827

R-squared	0.280965	Mean de pendent var	0.003689
Adjusted Rsquared	-0.078552	S.D. dependent var	0.005836
S.E. of regression	0.006061	Akaike info criterion	7.103318
Sum squared resid	0.000808	Schwarz criterion	-6.564603
Log likelihood	132.7564	Hannan-Quinn criter.	6.919601
F-statistic	0.781506	Durbin-Watson stat	2.395320
Prob(Fstatistic)	0.655180		

TABLE F: FUNCTIONAL FORM

Ramsey RESET Test
Equation: UNTITLED
Specification: LNLR LNLR(-1) LNMPR LNMPR(-1) LNTO LNTO(-1) LNTO(-2) LNFD LNFD(-1) LNFD(-2) LNCPI LNCPI(-1) C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.09961	21	0.7001

F-test summary:

	Sum of Sq.	Df	Mean Squares	F-statistic	1.29688 (1, 21) 0.7001
Test SSR	0.05423	2	1 0.054232		
Restricted SSR	0.12542	5	22 0.005701		
Unrestricted SSR	0.07119	3	21 0.003390		

Unrestricted Test Equation:
Dependent Variable: LNLR
Method: ARDL
Date: 09/18/16 Time: 23:51
Sample: 1982 2015
Included observations: 34
Maximum dependent lags: 2 (Automatic selection) Model selection method: Akaike info criterion (AIC) Dynamic regressors (2 lags, automatic):
Fixed regressors: C

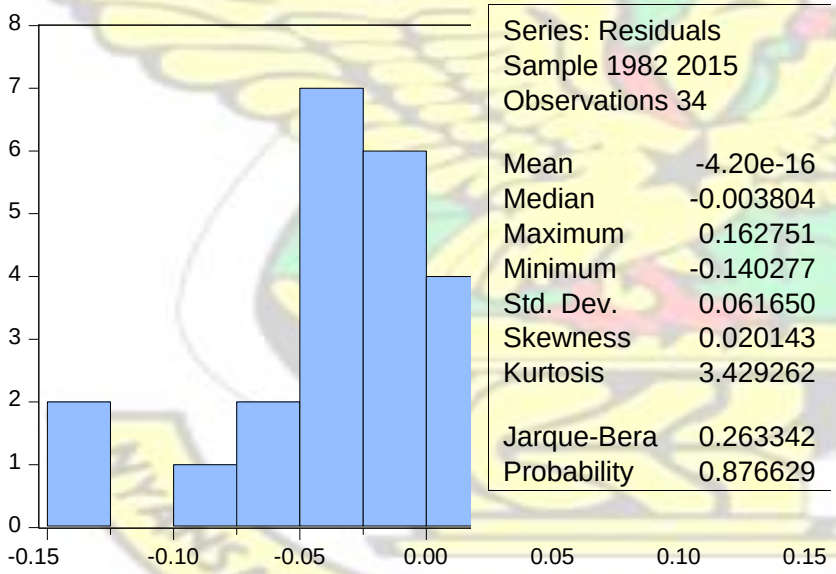
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNLR(-1)	1.411509	0.411031	3.434071	0.0025
LNMPR	-1.961838	0.566302	-3.464297	0.0023
LNMPR(-1)	-1.768283	0.516481	-3.423712	0.0026
LNTO	0.437550	0.144607	3.025797	0.0064
LNTO(-1)	-0.190767	0.120480	-1.583399	0.1283
LNTO(-2)	1.390093	0.400621	3.469841	0.0023
LNFD	-1.975328	0.570358	-3.463314	0.0023
LNFD(-1)	-1.260643	0.368311	-3.422772	0.0026
LNFD(-2)	-1.693595	0.493761	-3.429989	0.0025
LNCPI	2.308911	0.678413	3.403401	0.0027
LNCPI(-1)	3.118211	0.906910	3.438281	0.0025

C	8.264401	1.886454 4.380919	0.0003
FITTED^2	1.172540	0.293163 3.999610	0.0007

R-squared	0.963300	Mean dependent var	3.357286	Adjusted R-squared	0.942329
S.D. dependent var	0.242455	S.E. of regression	0.058225	Akaike info criterion	-2.566138
Schwarz criterion	-1.982530	Sum squared resid	0.071193	Hannan-Quinn criter.	-2.367111
Durbin-Watson stat	2.190703	Log likelihood	56.62435	F-statistic	45.93431
Prob(F-statistic)	0.000000				

*Note: p- values and any subsequent tests do not account for model selection.

FIGURE A: NORMALITY TEST



STABILITY

FIGURE 2A: CUSUM

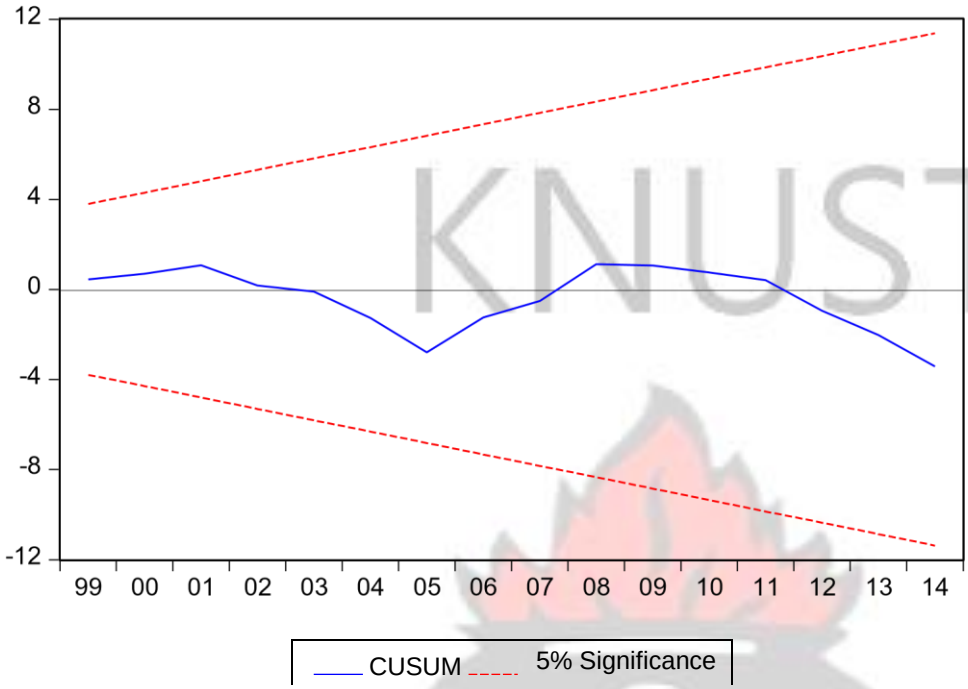


FIGURE 2B CUSUM SQUARES