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# **The Signalling Effect of Monetary Policy Rate on Lending Rates in Ghana.**

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**UNIVERSITY OF GHANA**

**UNIVERSITY OF GHANA BUSINESS SCHOOL**

**THE SIGNALLING EFFECT OF MONETARY POLICY RATE ON  
LENDING RATES IN GHANA**

**BY**

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,  
LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE  
AWARD OF MASTER OF SCIENCE IN DEVELOPMENT FINANCE  
DEGREE.**

**JULY, 2018**

## DECLARATION

I hereby declare that this submission is my own work as part of the award of graduate degree of MSc. Development Finance 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 degree of the University, except where due acknowledgement has been made in the text.

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## ABSTRACT

This study was undertaken to determine the pass through effect of the Central bank's monetary policy rate on commercial banks' lending rates. Specifically, the study sought to ascertain the short and long run relationship between these variables of interest. It employed monthly time series data spanning from 2002 to 2017 which was sourced mainly from the World Development Indicator (WDI) and Bank of Ghana (BOG). Autoregressive Distributed Lag Model (ARDL) was the estimation technique used for analyzing the data. Estimates from the Augmented Dicker- Fuller (ADF) and Phillips-Perron (PP) unit root test showed that the variables were all integrated of order one (1).

The findings found that there is a positive relationship between average lending rates and Monetary Policy Rate (MPR). MPR was significant in both the long and short run and had a large marginal effect on lending rates compared to all the other variables. However, in the short run the speed of adjustment was relatively slow. This implied a more rigid downward adjustment of average lending rate to changes in all the variables. Money supply in the economy denoted by M2+ was negatively related to average lending rates. Treasury bill rate was the only variable which was negatively insignificant in the short run. Based on the above findings the study recommends appropriate measures to be implemented to assist in fully developing the financial markets.

**Key Words:** Average Lending Rates, Monetary Policy Rate, Bank of Ghana

## **DEDICATION**

This work is dedicated to my father, Mr. Lawrence Lartey, my mum Mrs. Beatrice Lartey and my sisters whose constant support and prayers contributed immensely to the completion of this work and during the entire period of the program.

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## **LIST OF ABBREVIATIONS**

BOG Bank of Ghana

MPR Monetary Policy Rate

ADF Augmented Dicker-Fuller Test

PP Phillips-Perron Test

ECM Error Correction Model

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

In the early 1980's Ghana experienced an economic crisis which left the economy in shambles. Government officials misappropriated funds, with high levels of gross economic misconduct and overall macro-economic instability. This season was coupled with severe drought and famine and repatriation of Ghanaians from Nigeria which further worsened economic stability. Also, the monetary management system of the economy was directly controlled which was characterized by price ceiling imposition both globally and on sector basis. Lending activities of commercial banks had to be consistent with national macroeconomic targets which included economic growth, inflation and a sound external balance. According to the evolution of monetary policy by the central bank, these arrangements proved futile and had introduced inefficiencies in various sectors of the economy as time went by. In addition to the above, series of coup d'état befell the nation just after independence on 6<sup>th</sup> March, 1957. The government at the time of the crisis was overthrown by the Provisional National Defense Council (PNDC) in 1981, headed by Flight lieutenant Jerry John Rawlings.

The government of Ghana during the economic crisis in the early 1980s, agreed to undertake a Structural Adjustment Program formulated by the World Bank and the IMF with hopes of salvaging the situation (Jeong, 1995). The program was very intense such that it recommended and emphasized the removal of price controls, privatization of some state industries, and elimination

of subsidies, removal of trade barriers to ensure free trade, and other orthodox liberal economic measure. During this significant transformation of the financial structure in the economy, Ghana's Central Bank abandoned the direct control system of monetary management. As this system progressed; an Act was passed in December 2001 stating the independence of the Central Bank and its ability to use any economic tool available at her disposal in achieving her primary objective of price stability.

Monetary Policy Committee (MPC) was then established later in September 2002 and used the Monetary Policy Rate (MPR) amongst other monetary tools to control and stabilize the economy. The MPR serves as a referencing and signalling rate for all the other rates in the economy, BOG (2011). The rate also serves as an indicator for macro economic stability and regulates liquidity in an economy. Many research conducted has proven the importance of the private sector in driving economic growth. A large number of constituents in the private sector are found in the Small Medium Scale Enterprises (SME). This sectors contribution to Ghana's gross domestic product (GDP) through job amongst others cannot be underestimated.

Successive governments in the past have implemented various policies and adopted drastic measures to reduce poverty and accelerate economic growth. Some of these which propelled the agenda included increasing Foreign Direct Investment (FDI), diversifying the economy, enacting policy frameworks which favors small business ownership and at most initiating employment and entrepreneurship programmes (Matouseka & Solomon, 2015). Notable examples included National Youth Employment Programme (NYEP), Microfinance and Small Loans Centre (MASLOC) who provide employment for the youth and micro and small loans for start ups and small

businesses. Despite the immense support given by government to these SME's they still face a lot of challenges which hinders their growth.

The banking sector in Ghana has experienced immense transformation from the era of financial repression to financial liberalization. In 2005, the number of registered banks in the country was twenty (20). Due to improved financial deepening and trade liberalization the number of banks increased to twenty seven (27) in 2013. Monetary improvement coupled with financial liberalization amongst other factors led to the merger and acquisition of some banks and the surge in number of foreign owned banks in subsequent years. However as at April 2018, the number of commercial banks increased to 34 (BOG-Banking Sector Report, May 2018). Commercial banks act as intermediaries by lending to individuals and organizations by soliciting funds from surplus saving unit. Interest rates are determined in the credit market by marking up commercial banks base rate and supplying credit at this rate to credit worthy borrowers. The degree and level of competition in the banking sector and the risk and liquidity considerations of banks determine their mark-up price. Therefore, they are price makers and quantity takers within the limits of the credit worthiness of a borrower.

An effective financial intermediation as measured by interest rate spread is a very crucial factor in economic development through mobilization of resources for productive purposes (Folawewo & Tennant 2008). Inadequate access to credit or finance and high cost of credit stifles the growth and productivity of SME's and consequently slows down economic growth. Some economist believe financial liberalization drives growth and vice versa. However Baako, Acheampong and Ibrahim (2017) concluded in their study that increasing deposit mobilization does not always translate into supply of credit to the private sector. Moreover, Abor and Biekpe (2007) stated that SMEs that are

old and larger depended more on bank loans. Therefore if the lending rates in the financial market are favorable to the SME they will be able to access finance at a cheaper cost which will propel growth.

Castro & Santos (2010) stated the importance of monetary policy as one of the many factors that affected lending rate. However, the monetary policy has different transmission mechanism to ensure its effectiveness. The bank lending channel can only be possible under two conditions; if there are borrowers who are dependant on banks for their loan requirement and if the supply of loans of these commercial banks are affected by movements in an economy's monetary policy (Coll, Santander & Torres, 2005). Therefore in a small and developing economy which is mainly dependent on bank lending and whose financial sector is highly concentrated, it is inherent of the Central Bank to make effective monetary policies.

Mishkin (1995) emphasized the need for monetary authorities to be experts in monitoring and interpreting the effect of policy actions on an economy when conducting a monetary policy. This include an in depth knowledge on the monetary transmission mechanism. MPR changes influences commercial banks' lending rate and thus, reduces or increases the amount of money available on the market for business and individuals to trade with.

## **1.2 Problem Statement**

In recent times, one of the biggest challenges facing Ghana and particularly the private sector is the persistent increase in commercial banks' lending rates. The transformation of the economy from a controlled to a liberalized market economy has seen the private sector increasingly become

the driving force of the economy. However, the cost of borrowing has been rising incessantly making it difficult for the private sector to access credit from the commercial bank. This is largely so because, most borrowers especially owners of small businesses and firms largely depend on commercial banks for their financing needs (Abor, 2004). Therefore the disruptions in banks credit or the failure of the financial system could affect economic activities.

The government in its quest to achieve high growth levels and economic stability has provided an enabling environment for the growth of the private sector. In order to attain macroeconomic stability, the Bank of Ghana (BOG) considers the current economic growth and inflation rate before setting the MPR. Thus a high policy rate implies the BOG is embarking on a contractionary policy to mop up excess liquidity to control inflation amongst other objectives. This increase in MPR signals all other rates in the economy to increase. The reverse holds true. According to Folawewo and Tennant (2008) policy rates are positively correlated with commercial banks' lending rate. Quite a number of researches have been done on various determinants of lending rate. These determinants included bank specific factors, industry specific factors and the macro-economic environment. Nonetheless the study focuses more on the macro-economic determinants of lending rates in Ghana.

Prior to 2012, an old formula used in calculating the base rate according to the central bank did not promote transparency. There was no uniformity in determining interest rates of banks in Ghana. Adoah (2015) also stated that banks lent below the Central Bank's policy rate, a situation which undermined the primary objective of this rate to influence the lending behavior of the banking industry through their interest rates. The Central bank (CB) therefore upon several consultations with various industry players introduced a new base rate formula to guide all banks.

However, a decrease in MPR in recent times is not reflected in the commercial lending rate. The commercial banks' lending rate increases incessantly relative to the policy rate. Also if the market interest rate were to constantly deviate from the central bank's announced target, the public may begin to question the reliability and credibility in the implementation process (Kovanen, 2011).

The study therefore seeks to address this problem by establishing possible reasons why lending rates are not moving concurrently with MPR. Are the reasons likely to be the distortions in the retail loans and deposit market as illustrated by Sanusi (2010) or by the various macro economic variables which determines lending rates? The paper studies the short run and cointegrated relationship between the rates and determines the pass through effect between the variables

### **1.3 Study Objectives**

There are so many reasons that may inform ones decision in embarking on this study. The general objective of the study basically determines the link between MPR and lending rates in Ghana. The specific objectives are listed below.

1. To investigate the association between Monetary Policy Rate (MPR) and Lending rates in Ghana.
2. To assess the pass through effect of Monetary Policy Rate on Lending rates in Ghana

### **1.4 Research Questions**

1. Is there an association between MPR and lending rates?
2. What is the speed and magnitude of the pass through effect of MPR on lending rates?

### **1.5 Research Hypothesis**

H<sub>0</sub>: There is no association between average lending rates and monetary policy rate.

H<sub>1</sub>: There is association between average lending rates and monetary policy rate.

H<sub>0</sub>: There is no pass through effect from Monetary Policy Rate to Lending rates in Ghana.

H<sub>1</sub>: There is a pass through effect from Monetary Policy Rate to Lending rates in Ghana.

### **1.6 Scope of the Study**

Conceptually, the study sought to investigate the impact of specific macro financial variables on average lending rate in Ghana. The liberalization of the financial sector increased access to credit in the economy. Finance driving growth and vice versa forms one of the reasons for the study and hence some selected variables in the analysis. The study period is designed to have coverage on relevant monthly data between 2002 and 2017. This time period was preferred due to readily availability of data from reliable sources and also the period when policy rate was first introduced. The research was conducted in Ghana and included all banks' lending rate as at the time the study was conducted.

### **1.7 Justification of the Study**

Findings of this research will be of benefit to policy makers, banks, industry players and finally will contribute to the body of knowledge and earlier research conducted on the subject matter. The main purpose of the Monetary Policy Committee is to ensure price stability. Lending rates non-responsiveness to changes in the policy rate has been the most recent subject matter discussed in the country. Therefore, the factors that affect price stability in the economy which propels growth through the banking sector will be better understood. The underlying factors in the computation of

the base rate have been reviewed in the study. The findings therefore will assist the Central Bank in adopting accurate measures to ensure compliance with the MPR.

The commercial banks will also better appreciate the factors that contribute to economic growth and the effect of their high lending rate on the economy. Market imperfections in the financial sector as well as poor risk management practices likely to influence the stickiness of the lending rates will be addressed.

Key industry players and households who frequently access credit from the banks will understand the reasons behind the high rising commercial banks' lending rates and the non-correspondence with the policy rate hence make prudent borrowing decisions. The monetary policy tools do not work in isolation hence, the government through its fiscal policy and objective will better be informed on the effect of monetary policies on commercial banks' lending rates and proffer some recommendations. This study will form a basis for further research to be conducted.

### **1.8 Limitations of the Study**

Like every other research, certain set back were encountered while conducting the study. One major limitation of the study was the unavailability of monthly data of some other macro-economic variables which influences lending rates. Data available were on yearly basis and were incomplete for some periods. Therefore, these variables were not included for consistency sake.

The time span for the project was short for a comprehensive and enormous work to be done. Therefore, further areas of research will be recommended in the subsequent chapters. However the

sacrifices, credibility and reliability of the source of data contributed to the completion and accuracy of the findings respectively.

### **1.9 Organization of the Study**

This study is made up of five principal chapters with each chapter sub-divided into sections and subsections. The first chapter introduced the study by way of concisely explaining the details of the study. Reviewing of both theoretical and empirical works on the link between lending rates and macroeconomic indicators was provided in Chapter two. Chapter three deals with the methodology, which includes the type of data and source, model specification and estimation techniques. The analysis of the results and discussion of findings was done in Chapter four. Finally, chapter five concludes the study by summarizing the findings, and enumerating the policy implications and recommendations

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This section is embedded with theories of some renowned proponents of the subject matter and reviewed works of other researchers in the field upon which the study will be anchored. Series of studies conducted by different researchers in relation to the topic will be evaluated in the empirics.

#### **2.2 Theoretical Review**

##### **2.2.1 Loanable Funds Theory**

The Neo-classical economist believe that time preference plays an important role in determining interest rate. Adoah (2015) stated the fact that the theory builds on the classical theory of interest rate, by laying more emphasis on money supply influencing savings and investment. The amount paid for loanable funds in the credit market depends on the supply and demand of funds. An upward adjustment in the supply of loanable funds or excess reserve results in a decline in the interest rate. The supply of loanable funds increases as a result of an increase in planned savings. This is due to an increment in expected income with a corresponding increase in rate of return as well.

Reducing the money stock of hoarded funds when interest rates are high also increases the supply of loanable funds. The demand for loanable funds however is determined by an increase in firms expenditure for purchase of new capital goods to increase inventory or for expansion. An individual desire to increase present consumption but constrained by budget also influences the

demand for loanable funds. Therefore the magnitude and specific direction of a change in the demand and supply of loanable funds determines the resultant interest rate (Kamau, 2015)

### **2.2.2 Loan Pricing Theory**

The theory explains the resultant effect of information asymmetry due to high interest rate set by banks. Interest rate set by banks is mostly not commensurate with the level of risk of individual borrowers. Stiglitz and Weiss (1981) elaborated the difficulty banks face in determining the type of borrower at the start of a banking relationship which will inform an appropriate forecasting of interest rate on loans. He therefore advised that in maximizing interest income, banks should inculcate information asymmetry problems in the market. Otherwise high interest rate will inevitably attract risky borrowers.

The problem of moral hazard and adverse selection are most likely to arise if bank lending rates are high. High risk individuals are given loans at high rates who later develop moral hazard behaviour in their quest to get high returns on risky investments. This then may be a factor contributing to an increase in the non performing loans recorded by banks. The high cost incurred by banks due to this theory may summount to the reason why changes in the policy rate is not reflected in banks lending rate. Since banks may want to recoup their losses at the existing rates. Stiglitz-Weiss phenomenon of endogenous loan default further explained the reduction in banks profit due to high loan default. Therefore banks will need some time to adjust their rates in response to fluctuations in policy rates

### **2.2.3 Expectation Theory of Interest Rate**

Investors mostly anticipate and forecast future economic situations based on current situations and available information. According to this theory, changes in interest rate arises as a result of unexpected change in market information or changes in economic variables. In a world of precision and certainty, the equilibrium forward rates must coincide with the future spot rate, however the introduction of uncertainties in future rates, makes the analysis more complex (Ross, Ingersoll & Cox, 2005).

Therefore, if people expect interest rate to increase, they will avoid borrowing and this will have some effect on the banks balance sheet and performance as it reduces their interest income. People will therefore prefer to save at the high interest rate than to borrow. In contrast to the above, an expectation of a low interest rate will encourage people to borrow hence enhances banks performance due to an increase in interest rate earnings.

### **2.2.4 Keynesian's Theory**

A book written by Keynes "*The General Theory Of Employment, Interest And Money*" was first published in 1936 and proposed a purely monetary theory for interest rates. It also provided a solid foundation which formed the basis for developing a political and economic system. He was of the view that transmission mechanism of monetary policy included interest rates and investments. The interest rate channel is based on traditional Keynesian interpretation of the role of money in interest rates movement. When the Central bank embarks on an expansionary monetary policy, it subsequently leads to a decline in interest rate. This further translates to an increase in spending, aggregate demand and output and consequently decreases unemployment.

This theory is contrary to the monetarist view of expansionary monetary policy increasing mostly prices and not output hence its ineffectiveness. However unlike the monetarist who focused on full utilization of resources, Keynes theory was only a general theory which presupposes that the utilization of resources could either be low or high in quantity. He concluded that in certain instances, no strong automatic mechanism can move aggregate output or demand towards full employment levels.

Keynes assumed that interest rate is the price at which the desire to hold wealth in cash is at an equilibrium with the supply of cash resources and the reward for parting with liquidity at the same time (Appelt, 2016). His liquidity preference theory, stated interest as a reward for substituting liquidity for another item for a specified period of time. Investors will always prefer short term financial securities to long term financial securities hence to encourage them to hold more long term securities, interest rate should be higher than for short term securities. This explicitly explained the theory of demand for money. While the supply of money was treated as a discretionary factor which depended on policies pursued by monetary authorities.

In the credit market, banks influence interest rate by marking up their base rate and supply credit to credit worthy borrowers (Kamau, 2015). If these determinants are held constant, the Central Bank interest rate setting in the base money market will influence the credit markets interest rate. Therefore a free market according to Keynes does not necessarily ensure efficient allocation of resources but the state intervention prevent excessive savings which could lead to unemployment (Appelt, 2016).

### **2.2.5 The Theory of Collusive Behavior of Banks**

The asymmetry adjustment of interest rate can be attributed to the collusive behaviour of banks. This theory explains the degree of competition among banks and the concentration of banks in the retail market. According to De Bondt (2005), lending rates will be rigid downwards in relation to a decline in policy rate. Banks however will not want to disrupt their collusive arrangement by decreasing lending rates.

### **2.2.6 Customer Reaction Hypothesis**

It explains the upward rigidity of lending rates with an increase in policy rates. A highly competitive environment for banks will prevent them from increasing lending rate for fear of negative reaction of borrowers.

### **2.2.7 Monetary Policy Transmission Mechanism.**

The understanding of the transmission mechanism by most Central Banks has largely led to their success at controlling inflation and stabilising output within their domestic economies (Abradu-Otoo, Amoah & Bawumia, 2003). Monetary policy can influence real sector activity and output through several channels. The theory of transmission mechanism classified the channels as interest rate channel, asset price channel and credit channels.

The most basic channel of the transmission process is the interest rate channel which includes changes in the money supply of an economy. According to Mishkin (2007) through the liquidity effect, an expansionary monetary policy will cause real interest rate to fall. The cost of capital reduces resulting in an increase in investment spending by firms and households.

The bank lending channel or credit channel describes the effect of changes in monetary policy instruments on the amount of loans disbursed by financial institutions. A study by Bernanke and Blinder (1988) cited the importance of the credit channel and that a tight monetary policy which involves an increment in interest rates will reduce the reserves of banks and deposit. This will subsequently contract the loans given to businesses and consumers. A reduction in reserve requirement will expand the economy by leading to an increase in banks reserves and the quantity of bank loans available.

However, Gertler and Gilchrist (1993) gave two complementary ways through which the credit market imperfections makes the transmission mechanism relevant. The bank lending channel can only be possible under two conditions; if there are borrowers who are dependant on banks for their loan requirement and if the loan supply of these banks are affected by movements in monetary policy (Coll, Santander & Torres, 2005). If borrowers depend largely on bank loans then a change in banks wiliness to lend, immediately affects their investment and spending decisions. A bank willingness to lend can change due to a decrease in bank deposit hence a decline in the volume of money available for loans. Therefore a decline in monetary policy rate will not be sufficient to reduce lending rate and hence decreases investment (Hung & Pfau, 2008).

Economists and policymakers hold a general view that monetary policy works mainly through interest rates (Amidu, 2006). These findings was supported by Borio and Fritz (1995) such that the issue of size and speed of banks response to changes in policy-controlled interest rate, through their lending rates, represent an important dimension of the transmission mechanism of monetary policy. Moreover the BOG uses short term money market interest rate as its operating target such

that cost of funding for banks and eventually lending rates are to be influenced by the short term rates (Kovanen, 2011).

Bernanke and Blinder (1992) supported the credit channel view in the United States (US) upon attaining an inverse relationship between bank loans and tight monetary policy. They used 3-month treasury bills rate to capture exogenous shifts in monetary policy and concluded that a tight monetary policy led to high lending rates of banks hence reduction in loans.

### **2.2.8 Determinants of Lending Rate**

Banks are the principal providers of funds to governments, corporate bodies and individuals therefore their lending decisions cannot be overlooked as reported by Ladime, Kumankoma-Sarpong and Osei (2013). The findings of research conducted by Sanusi (2010) elaborated the distortions in the retail loans and deposit market as a reason which will continue to render monetary policy ineffective. Some of these distortions included poor risk management practices. According to a Banking Sector Report from the Bank of Ghana in January 2018, all banks are to establish stringent risk management frameworks for effectiveness, responsiveness and timeliness in dealing with risk to protect depositors funds.

Acheampong (2005) further emphasized on banks reluctance to reduce lending rates in situations where firms largely depend on bank loans for their activities. He attributed this findings to the underdevelopment of the money and capital market which puts less pressure on banks to reduce lending rates in correspondence to market conditions. In addition to addressing these issues, other factors which determine lending rates mainly bank specific are enumerated below.

According Gockel and Mensah (2006) operating cost of commercial banks are the largest contributor in determining the interest rate. Banks increase their base rate prior to the addition of a borrowers risk premium and the policy rate. Banks often transfer this high operating cost to borrowers in order to remain in business.

In addition to the aforementioned, Ngugi (2001) cited market imperfection as causing a wide interest rate spread therefore high competition narrows the gap between lending and borrowing rate since management are forced to find alternative sources of finance for the banks. Also when banks have to compete with other financial institutions or securities market whose interest rate fluctuates for funds, they will feel more pressured to change their lending rates than if they largely depend on deposit as a source of fund for loans, Acheampong (2005). The Ghanaian banking system is characterised by monopolistic competition with a high financing need of the government which leads to a high supply of treasury bonds, Kovanen (2011). This undermines the competition between banks and the private sector as a result of an increase in lending rate to the private individual who is more risky than the government.

Also Ustarz and Nkegbe (2015) concluded in their study that banks pass on their inefficiencies to their customers by increasing lending rates and reducing deposit rates. Matemilola *et al* (2015) also suggested that the structure of South African bank contributed to the downward rigidity of the lending rates. However, they cited legislation, technology, products amongst others as injecting more competition in the industry and may partly account for upward rigidity of lending rates.

### 2.2.9 Determinants of Policy Rate

The cost of borrowing by the deficit spending unit and a reward for lending by surplus spending unit is determined by interest rate. The interest rate is an important economic variable which needs to be effectively guided to ensure economic stability. Kelilume (2014) defined interest rate pass-through effect as the process in which the interest rates of banks respond to changes in monetary policy instruments.

The Bank of Ghana takes into account risk associated with the financial markets in its monetary policy formulation in order to promote and maintain a sound financial sector and payment system. Some of the risk that banks face or distortions encountered affect their cost of doing business or retail interest rate. They also take into consideration the current economic situation which includes the level of both current and expected rates of economic growth and inflation rate. The monetary policy committee of the central bank meets every other month in the year. They introduce formulae every now and then to guide banks in determining the base rate to aid in calculating lending rates.

The old model was:

$$\left[ \frac{AOE}{TA-OA} + \frac{DWACF}{1-(CRR+DCIV)} \right] + PM + GP$$

Where :

AOE (Annualised Operating Expense), TA (Total Assets), OA (Other Assets), DWACF (Domestic Average Weighted Cost of Funds), CRR (Cash Reserve Ratio), DCIV (Domestic Cash In Vault Ratio), PM (Profit Margin), GP (General Provision of 1% on current loans)

After this model was implemented, the lending rates were however still unresponsive to the decline in policy rates. Aside the non traditional monetary policy tool (moral suasion) employed by the central bank to appeal to the banks to reduce lending rates in accordance with the decline in policy rate, a new base rate model was formulated.

The Ghana Reference Rate(GRR) was formulated in February, 2018 to be used by all commercial banks to calculate their base rate. It is illustrated below as ;

$$GRR = \sum_1^i MI_i W_i + \left[ \frac{T'Bill}{1 - CRR - CIV} \right] W_{tbill}$$

Where MI-Market Indictaor (Policy Rate and Interbank Rate)

W-(Weight of Market Indicator I)

T'Bill-91 day Treasury Bill Rate

Wtbill-Weight of the 91 day Treasury Bill Rate

### **2.2.10 Macroeconomic variable**

Ngugi (2001) suggested that a high credit risk due to distress borrowing and poor macroeconomic variables causes banks to charge high risk premium on their cost of funds. The macroeconomic environment therefore affects the banking sector by influencing borrower's ability to repay loans. Also, Kwakye (2010) stated the impossibility of banks to reduce the lending rate due to high cost of doing business in the presence of a double digit inflation. Inflation reduces the value of money and purchasing power as well. With high inflationary rates borrowers are unable to get expected return from investment in order to pay off their debt leading to high default rate.

Treasury bill rate is the risk free rate charged on investment. Ngugi ( 2001) discovered in her research, an asymmetric relationship between treasury bill rates and lending rates whenever treasury bill increases. However a decline in treasury bill rates has a sticky downward relationship with lending rates. Owing to the high positive return on treasury bill rates, a sizeable portion of assets were invested which led to the crowding out of the private sector in the credit market. Some studies done in Kenya on the determinants of loan pricing also concluded that a rise in the cost of living which is measured by inflation and the depreciation of the local currency contribute to high lending rates.

### **2.3 Empirical Review**

Many factors have been enumerated as causing changes in banks lending behaviour and cost of credit in the financial market. The economic environment which supports the operations of banks are taken into consideration when setting lending and deposit rates. These and many other reasons cited by researchers have been discussed below.

Amidu (2006) conducted a research to determine whether bank lending is constrained by monetary policy in Ghana. The central banks prime rate and money supply were proxies for monetary policy. He used a panel cross sectional data from 1998 to 2004 to identify the main monetary policy factors that influences bank lending behaviour in Ghana. Based on his analysis he concluded that the economic conditions of a country and changes in money supply affects banks lending behaviour. The result of the study further concluded that central banks prime rate and inflation negatively affect banks lending behaviour. However the relationship was statistically insignificant. It also revealed that the size of the bank and its liquidity determined its ability to attract investment and extend credit when demanded. Bigger banks are better positioned to attract more investment in the

form of deposits and also business loans and total loans are unaffected by tight monetary policy due to their varied alternate sources of finance. This was in contrast to Gertler and Gilchrist (1993) whose findings took different tangent and stated that a tight monetary policy led to a decline in lending to small firms than large firms.

A study on the pass through effect of policy rate on retail bank interest rates was done by Mbowe (2015) in Tanzania. The relationship between the central banks policy rate and commercial banks interest rate identified the presence of the interest rate channel of the transmission mechanism. The findings concluded that the pass through effect of the policy rate on the deposit rates and interbank interest rate in the short run were statistically significant. However the pass through effect on the deposit rate was attributed to differences in the size and type of bank (i.e foreign or local) and occurred with a lag. This findings simply implied the limited effect of the interest rate channel on the effectiveness of the monetary policy in Tanzania. To the extent that the aggressive use of policy rate to maximize the monetary policy objectives may adversely affect banks with weak balance sheets. Commercial banks were therefore advised to adopt accurate forecasting techniques of the implementation approach of monetary policy to avoid the delay in the pass through effect.

The presence of the bank lending channel in Philippines was studied by Aban (2013). He used quartely data from 2008-2011 of 35 commercial banks in the country to ascertain effect of loan growth on monetary policy shocks. The banks were segregated according to sizes and panel ordinary least square method was adopted to determine the impact of the shock. His findings concluded that bank characteristics, particularly size, influences the bank lending channel. The

result of the study showed that small banks loan growth are more sensitive to changes in monetary policy than big banks.

Sanusi (2010) did a similar work as Mbowe (2015), however he used the Impulse Response Functions from a Structural Vector Autoregression (SVR) model to derive the dynamic elasticities of the pass through of monetary policy rate and interbank interest rate to the retail lending and deposit rates. The study used monthly data from 2002 to 2010 to determine the magnitude and speed of the interest rate pass through effect. The findings of his work elaborated the distortions in the retail loans and deposit market which will continue to render monetary policy ineffective. The result of his study was consistent with series of reviewed literature which stated the incomplete and slow nature of the interest pass through effect. The Central Bank must therefore concentrate its efforts also in removing these distortions in order to make the monetary policy rate effective.

Acheampong (2005) in a working paper for the Bank of Ghana, performed an econometric analysis on the interest rate channel of the monetary transmission mechanism. His study used a dummy variable to capture the effect of a change in policy from bank rate to prime rate. The study used cointegration and error correction model to examine the effect of a change in money market rate on deposit and lending rates. The results showed a weak transmission in the view of the slow response of bank interest rate to changes in the money market rate. The evidence of the study supported the equal adjustment of interest rate of banks to changes in the money market rate. The findings also concluded that the long run pass through from money market to bank lending rate was significantly weak while the deposit rate exhibited some flexibility. However he advised that the conclusion should be taken with caution due to the fact that treasury bill rate in Ghana is more of a fiscal

policy instrument than a monetary tool. The introduction of the prime rate in 2002 did not affect the deposit rate or the cost of funds but rather influenced the asset pricing of banks. He therefore advised the usage of sufficient data on prime rate as an independent variable to assess the extent to which the results will vary.

A study was conducted to test and confirm the determinants of commercial bank's lending behaviour in Nigeria by Olokoyo (2011) using ordinary least square estimation, unit root test and co-integration as method of analysis. The results of the study turned out as expected with bank deposit having the greatest impact on lending behaviour. He further recommended that commercial banks should focus more on mobilizing more deposit and formulate solid financial plans. In contrast to this findings, Georgievska et al.(2011) found out that deposit rate and non performing loans were found to affect lending rate the least in Greece. However domestic policy rate and foreign interest rate had significant effects on determining lending rates.

Obeng and Sakyi (2017) in the study of the macroeconomic determinants of wide interest rate spreads in Ghana advised the central bank to implement measures to strengthen the cedi, since the vulnerability of the currency increases the interest rate spread. The data used spanned from 1980-2013 using the autoregressive distributed lag bound model. The findings concluded that in the long run, fiscal deficit, economic growth, public sector borrowing from commercial banks and exchange rate volatility increases interest rate spread. Sheriff and Amoako (2014) also encouraged the government and central bank to embark on policies that maximize savings while keeping interest rate, inflation and government borrowing on the low.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter outlines the method and the conceptual framework of the model specified for the study. The chapter is organized into four main sections. Section 3.1 briefly describes the types and sources of data used for the study. It includes a descriptive table of similar works done on the study in different jurisdiction and the expected signs. The specification of the model used for the study is discussed in section 3.2. The estimation technique with emphasis on the stationarity test, Co-integration test and the Autoregressive Distributed Lag (ARDL) model, also known as the Bounds Test were focused in section 3.3. The conclusion of the chapter with how the model was estimated using the ARDL Bounds testing procedure was summarized in section 3.4.

#### **3.2 Data Type and Source**

Secondary data was the main type of data used for the study. Specifically, data from World Development Indicator (WDI) and BOG were employed. These also included annual banking reports, summary of economic and financial data and monetary policy committee report of the Bank of Ghana. This study used monthly time series data from 2002 to 2017 inclusive of all the variables, with a sum total of 188 monthly observations.

The data commenced from 2002 because the MPR was first introduced and enacted during this period. It also used average lending rates of all banks in Ghana at each particular point to estimate the lending rate within the period. Monthly data was preferred due to the fact that it showed a true

reflection and more precise effect of the MPR on the lending rate. Also it was announced every other month, thus 6 times in a year hence its effectiveness.

### **3.3 Variable Description**

#### **3.3.1 Lending Rate**

It is described as the rate at which commercial banks lends to individuals. It is also the banks rate that usually finances the needs of the private sector. Every bank has specific variables and allocated percentage in deriving the formula for lending rates in general. That notwithstanding, the MPR is factored in calculating the base rate. The risk premium of each individual is then added to arrive at the lending rate. The average lending rates of all banks in Ghana was used as a proxy for the market lending rate.

#### **3.3.2 Monetary Policy Rate**

In the conduct of monetary policy, the Central Bank uses diverse tools. These tools are employed to stabilize prices in the economy and ensure economic growth. One may say the quest to prevent the occurrence of banking crises makes the central bank more robust in the operations. Therefore, the policy rate among other tools serves as a signaling rate for all other rates in the economy. Other countries in different jurisdiction however use different tools in their main monetary operations. Notable examples used include discount rates; repurchase rate and interbank rate etc.

#### **3.3.3 Money Supply (M2+)**

The stock of money available in the country at a particular time period determines the level of growth and health status of the economy. It was one of the proximate targets of the monetary

policy. Before the year 2002, this method was predominantly used to control the economy. The monetary aggregates were used to stabilize prices and economic growth. According to Mishkin (2007) through the liquidity effect, an expansionary monetary policy will cause real interest rate to fall. Cost of capital reduces leading to an increase in investment spending by firms and households. It is quoted as Broad Money (m2+) as a percentage of GDP.

### **3.3.4 91- day Treasury Bill Rate**

Interest rate on securities used to finance short term financial requirements of the Government. The risk attitude and appetite for long term credit of most Ghanaians are often low due to the instability of macro-economic indicators. This may be attributed to different reasons. Nonetheless the 91-day investment is predominantly bought into compared to the other securities. Banks prefer to lend to the government through treasury bill because the rates are often times above inflation rate and earn banks positive returns and are also relatively safe compared to other investors. However, it must be noted that Treasury bill rate is an indicator of interest rate policy undertaken by the government and acts as a benchmark for rates charged by commercial banks, Garr (2013). Therefore, changes in the MPR affect money market rate which later affect lending rate (Matemilola et al, 2015).

### **3.3.5 Inflation**

Consumer Price Index (CPI) is used as a proxy for Inflation in the study. Changes in the average general prices in the economy determines the health of the economy. It is the main target or goal of the central bank thus to ensure consistency in the equation it was included. Theories categorizes

inflation to be either demand pull or cost push. Which ever the reason is, the study will only seek to identify its relationship with lending rates.

### 3.4 Expected Signs of Variables

VARIABLES	MEASUREMENT	EMPERICAL SOURCES	SIGN
<b>Lending Rate</b>	Average lending rates of all commercial banks in the country	(Folawewo & Tennant 2008)	NIL
<b>Inflation</b>	Monthly consumer price index (CPI)	Njiru(2014)	+
<b>Money Supply</b>	M2+	Mishkin (2007)	-
<b>Treasury Bill Rate</b>	91 Day T Bill	Wanjaiya (2015)	+
<b>Monetary Policy</b>	Monetary Policy Rate	(Castro & Santos 2010)	+

### 3.5 Model Specification

In determining the link between monetary policy and lending rate, this section specifies an appropriate model for the analysis. The monetary policy rate represented monetary policy in the model because MPR is the instrument that mostly influences commercial banks' lending rates directly among all the other instruments of monetary policy.

The functional relationship of the empirical model appeared as follows:

$$ALR = f (MPR, TBILL, M2+, INF)..... (3.1)$$

The data was transformed to minimize the possibility of spurious result amongst others. Hence the log function is taken of all the variables. Log transformation is necessary since it can reduce the problems associated with heteroscedasticity and non-normality of the variables. The study adopted a log-linear modeling specification. The choice of a log-linear model is as a result of its superiority

to other approaches based on both theory and empirical basis (Kalim & Shahbaz, 2009; Cameron, 1994).

$$\ln ALR = \beta_0 + \beta_1 \ln MPR + \beta_2 \ln TBILL + \beta_3 \ln M2^+ + \beta_4 \ln INF + \mu_t \quad (3.2)$$

Where:

ALR=Average Lending rate

MPR=Monetary Policy Rate

TBILL= 91 day Treasury Bill Rate

INF= Inflation

$\mu$  = Error term

### **3.6 Estimation Method**

The relationship between lending rates and monetary policy rate was analyzed using quantitative data. The statistical package used for computing and analyzing the data was Econometric Views (Eviews 9). Price series data are mostly nonstationary because there is no fixed level for the price. Therefore, a unit root test is conducted using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to test the stationarity of the variables.

#### **3.6.1 Unit Root Test**

The unit root test was conducted by the study to test for stationarity of the variables. The bounds test is based on the assumption that the variables are either I (0) or I (1) series. The Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test proposed by Dickey and Fuller (1979) and, Phillips and Perron (1988) respectively were employed to test for stationarity.

The ADF test is used in determining the order of integration of each variable in the model because it assumes the errors are statistically independent and have a constant variance. In addition to this method, a more robust approach was the PP test which highly tested for heteroscedasticity and serial correlation present in the error term. In analysis, if the paper fails to reject the null hypothesis of a unit root at level or non-stationarity, first difference of the series is taken to ensure stationarity. Statistically, if the t-ratio is less than the critical value the null hypothesis of a unit root for each variable (i.e. the series is non-stationary) is accepted. The variables are therefore non stationary in levels. This conclusion does not rule out the fact that some series will have an Integral order of zero I (0). For the series that are non-stationary, the first difference is evaluated. The null hypothesis is then rejected if the series is considered stationary. This implies that the series is integrated of order one I (1).

### **3.6.2 Co-integration test**

The next process after the stationarity is determined is to estimate the short and long run relationship of the variables. The relationship between the lending rate and the independent variable is established. If there is no long run relationship but the variables are co-integrated, only the ARDL technique is applied. In the presence of long run relationship after the bounds test, the error correction model is applied.

### **3.6.3 The Autoregressive Distributed Lag (ARDL) Model**

The research utilized the ARDL model, also called bounds testing method as suggested by Pesaran et al. (2001), to examine the relationship between lending rate and monetary policy rate. The

presence, direction and extent of a long-run relationship between the dependent variable and the various independent variables are established as well. It provides a very valuable vehicle for testing for the presence of long-run relationships between economic variables (Giles, 2013). The model is autoregressive because the dependent variable is explained in part by the lagged values of itself. Embedded as well is a distributed lag component in the form of successive lags of the explanatory variables (Giles, 2013).

In case there is autocorrelation, the customary ARDL requirement needs to be augmented with a satisfactory number of lagged changes in the repressors before estimation and interpretation are carried out (Pesaran et al., 2001). According to Giles (2013) the bounds test method is preferred because it can be used with a mixture of I (0) and I (1) data. It also involves a single-equation set-up, making it simple to interpret and implement. Finally, different variables can be assigned different lag-lengths as they enter the model.

#### **3.6.4 ARDL Bounds Testing Procedure.**

The bounds test is most appropriate in determining the existence of a long run relationship between the dependent and independent variables in an equation. The lag length was automatically selected by E-views 9 according to the Akaike Information Criterion (AIC). The null hypothesis for this test is no long run relationship between the dependent and the various independent variables. To make a decision, the F statistic is compared with the lower and upper bounds. If the value of the F- statistic is less than the lower bound at the specified significance level, fail to reject the null hypothesis. This means there is no long run relationship. If the F statistic is greater than the lower bound but less than the upper bound, the test is inconclusive. Also, if the F-statistic is greater than

the upper bound, reject the null hypothesis. This means there is a long run relationship between the dependent and the independent variables.

## CHAPTER FOUR

### ANALYSIS AND DISCUSSION

#### 4.1 Introduction

This chapter presents an empirical analysis and discussion of the results of the study. The main objective of the research is to determine the pass-through effect of monetary policy rate on average lending rates in Ghana. The chapter has four subsections that adequately analyses the data and presents the findings in tables and figures below.

#### 4.2 Interpretation of Descriptive Statistics

The basic characteristics of the variables in the study are presented in Table 4.1 The descriptive statistic include mean, median, range, skewness and kurtosis.

**Table 4.1: Descriptive Statistics**

	ALR	MPR	INF	TBR	LnM2+
Mean	28.86989	18.40213	228.6945	18.92010	16635.15
Median	28.01500	18.00000	191.6500	19.34500	9003.900
Minimum	23.75000	12.50000	96.40000	9.130000	1043.600
Maximum	40.00000	27.50000	1401.100	39.30000	60521.51
Std Dev	3.689915	4.626406	129.6053	6.538149	16858.67
Kurtosis	2.888904	1.948498	36.66340	2.145085	3.069716
Observations	188	188	188	188	188

Evidenced from the table, the mean of average lending rate, Treasury bill rate, monetary policy rate inflation and money supply are all positive. It shows the average of each of the variables understudy, within the specified time period of 15 years (2002-2017). The values of the average lending rates fluctuated between 40.00 percent and 23.7 percent and their dispersion around the mean was 3.69. It also presupposes that throughout the period of study, the highest lending rate encountered was 40%. This rate is significantly high. It therefore behoves on businesses to venture into diverse investments that accrues higher return to enable them repay their loans. The kurtosis of 2.88 percent indicates that the distribution has fatter tails. Monetary policy rates oscillated between 12.5 percent and 27.5 percent and a variability of measure of 4.626 from a mean of 18.402. All the variables are positively skewed with fatter tails at the end. Average lending rate, monetary policy rates, Treasury bill rates, money supply according to the kurtosis rule are normally distributed with values of, 2.88, 1.95, 2.145, and 3.06971 respectfully.

### 4.3 Interpretation of Correlation Matrix

**Table 4.2 : Correlation Matrix**

Correlation Probability	lnALR	lnINF	lnM2_	lnTBR	lnMPR
lnALR	1.000000 -----				
lnINF	-0.437391 0.0000	1.000000 -----			
lnM2_	-0.308765 0.0000	0.298196 0.0000	1.000000 -----		
lnTBR	0.545972 0.0000	-0.357340 0.0000	0.069917 0.3404	1.000000 -----	
lnMPR	0.746436 0.0000	-0.620295 0.0000	0.003983 0.9567	0.742788 0.0000	1.000000 -----

The correlation matrix presented in the table 4.2 above illustrates the linear association between the pairs of variables. A strong positive linear relationship of 0.7464 exists between average lending rates and monetary policy rate. Inferences can also be made of the negative relationship between inflation rate, money supply and average lending rates. A moderately strong positive relationship is observed between Treasury bill rate and average lending rates. Also with a p-value of 0.000 the study failed to accept the null hypothesis of no association between the variables at a 5% significance level.

In addition to the above there is a strong relationship between Treasury bill rates and monetary policy rate. This can be explained by the fact that the Treasury bill rate is taken into consideration in setting the MPR. The Treasury bill rate is a risk free rate otherwise known as the threshold rate. All other rates are built on the Treasury bill rate. Consequently, an increase in Treasury bill rates leads to an increase in MPR, hence the high positive association. A high Treasury bill rate explains the inefficiency of the government in mobilizing tax revenues and seeking cheap funds from the domestic market. This inefficiency is translated to private sector and results in high lending rate. The MPR and lending rates are therefore positively and significantly associated as shown in the table above.

#### **4.4 Discussion of Time Series Properties**

Most econometric studies show that macroeconomic data which are analyzed with time series tests are non-stationary at levels (Engel & Granger 1987). This then presupposes that most Ordinary Least Square Regression carried out may not be reliable in the absence of diagnostic checks. Hence the need for diagnostic checks of all the variables to ensure that they become the best linear unbiased estimators. This section therefore examines the time series properties of the data by presenting the ADF and PP test. The PP test was conducted in addition to the ADF test to check the robustness of the unit root test results. The PP test modifies the ADF test and rectifies serial

correlation and heteroscedasticity in the error term. The test regression included an intercept and a linear trend for both logarithmic levels and the logarithmic first difference of the variables using E-views 9.0.

#### 4.4.1 Results of the Unit Root Test at Levels

In order to prevent spurious results, stationarity test is performed on each of the variables. A summary of the unit root test for both ADF and PP of the variables used in the study is illustrated in table 4.3. The result of the stationarity test as shown in Table 4.3 indicated all values of the series according to ADF and Phillips-Perron test (PP) are not stationary in their levels both at constant without trend and constant with trend. First difference is therefore performed to check the presence of unit roots

**Table 4.3: Result of the Unit Root Test at Levels**

Variables	LEVELS			
	ADF		PP	
	Constant	Constant trend	Constant	Constant trend
lnALR	(-2.815) [0.0581]*	(-2.464) [0.3456]	(-2.827) [0.056]*	(-2.479) [0.3383]
lnMPR	(-1.496) [0.5335]	(-1.556) [0.8065]	(-1.815) [0.3723]	(-1.795) [0.7032]
LnINF	(-2.272) [0.1822]	(-2.121) [0.5301]	(-2.554) [0.105]	(-2.777) [ 0.207]
lnM2+	(-1.244) [ 0.654]	(-2.753) [ 0.217]	(-1.807) [0.376]	(-2.358) [0.400]
LnTBR	(-2.038) [ 0.2703]	(-2.029) [ 0.581]	(-2.193) [0.2098]	(-2.203) [ 0.484]

*Tratio < Cvalue; Accept Ho Stating No Stationarity*

*Note: \*\*\*, \*\*, \* denote the acceptance of the null hypothesis of unit root at 1%, 5%, 10% alpha levels respectively. The critical values at the corresponding significance levels for the ADF test*

statistics are -3.461478(at 1%),-2.875128(at 5%) and -2.574090(at 10%). The lag selection for the ADF test is based on the Shwarz Info Criterion and the PP test is based on Newey-West Bandwidth. The *t* statistics are shown in round brackets and the probabilities in square brackets.

The *t* statistic of lnALR, lnMPR, lnINF, lnM2+, lnTBR-91day are found in the acceptance area at the various critical values of different significance levels. It is observed from the table that the ADF values were less than the critical values at 5% significance level. Implying that the null hypothesis was not rejected indicating the presence of unit root. The absence of unit root in the test statistic implies an existence of I (0) and I (1). The P-values are also greater than the 5% significance level hence it buttresses the reason for not rejecting the null hypothesis.

**Table 4.4: Result of the Unit Root Test (First Difference)**

FIRST DIFFERENCE				
Variables	ADF		PP	
	Constant	Constant trend	Constant	Constant trend
lnALR	(-13.091)*** [0.000]	(-13.215)*** [0.000]	(-13.091) *** [0.000]	(-13.210) *** [ 0.000]
lnMPR	(-7.189) *** [ 0.000]	(-7.274) *** [ 0.000]	(-15.068) *** [0.000]	(-15.098)*** [0.000]
Lninf	(-18.680)*** [0.000]	(-18.681) *** [0.000]	(-19.481) *** [0.000]	(-19.523) *** [0.000]
lnM2+	(-15.148) *** [0.000]	(-15.219) *** [0.000]	(-16.156) *** [0.000]	(-16.985) *** [0.000]
lnTBR-91 day	(-8.333) *** [ 0.000]	(-8.310) *** [0.000]	(-8.468) *** [0.000]	(-8.445) *** [0.000]

Note: \*\*\*, \*\*, \* denote the rejection of the null hypothesis of unit root at 1%,5%,10% alpha levels respectively. The critical values at the corresponding significance levels for the ADF test statistics are -3.461478(at 1%),-2.875128(at 5%) and -2.574090(at 10%). The lag selection for the ADF

*test is based on the Schwarz Info Criterion and the PP test is based on Newey-West Bandwidth. The t statistics are shown in round brackets and the probabilities in square brackets.*

#### **4.4.2 Results of the Unit Root Test at First Difference**

At first difference, the series were stationary at a 5% significance level for all the variables. This was however done because at levels, the series were not stationary hence the need to be differenced again to attain stationarity. The P-values (0.000) were also less than the critical value of 5 percent therefore we reject the null hypothesis and assume its insignificance. At the critical values (-3.46178,-2.875128,-2.574090), the t statistic were greater with or without linear trend.

Consequently, the null hypothesis of stationarity is accepted which presupposes that at first difference we failed to reject stationarity. It is also evidence from the table that all the variables were stationary at first difference i.e. I (1). With the presence of stationarity on all the variables, ARDL framework will then be applied to test for Co-integration amongst the variables. Also it indicates the absence of I (2), thereby making the ARDL test most appropriate.

#### **4.5 Co-integration Test**

A linear combination of variables that are I (1) which produce a stationarity result need to be co-integrated (Olokoyo, 2011). The relationship amongst the variables may be farther apart in the short run but will draw close and move together in the long-run. Therefore, to establish whether this relationship exist the Co-integration test was applied. The bounds test approach was therefore necessary to find the relationship between lending rates and MPR, hence the response of lending rates to changes in the policy rate.

**Table 4.5: ARDL Bounds Test**

Test Statistic	Value	k
F-statistic	8.346446	4
<b>Critical Value Bounds</b>		
Significance	I(0) Lower Bound	I(1)Upper Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: authors, result were obtained using E-views 9

*NB: I0 represent the lower boundary while I1 represent the upper boundary of the distribution. K represents the number of independent variables (inflation, 91 Treasury bill rate, MPR, M2+). Akaike Information Criterion (AIC) was used with an automatic maximum lag length of four (4) for the bounds-testing for the I(0) and I(1) component specifications.*

It can be inferred from table 4.5, that the value of the computed F-statistic is 8.346446 which is greater than the lower and upper bound levels at all the critical values at 10%, 5%, and 1% significance level. Simply put, the computed F value of 8.346446 is greater than 4.401 and 5.06 at 5percent and 10percent significance level respectively. Moreover at a statistically accepted significance level of 5percent the F-value was greater than the boundaries. The null hypothesis was rejected since a long run relationship exists among the variable. This therefore certifies the Co-integration relationship among the variable when lending rate is used as the dependent variable.

#### **4.6 Estimated Long run ARDL Result.**

The long-run relationship is estimated by selecting ARDL (1, 0, 3, 0, and 0) based on Akaike Information Criterion (AIC). The empirical evidence of the response of average lending rates to changes in MPR is reported in Table 4.6.

**Table 4.6: Estimated long run ARDL Result**

Variable	Coefficients	Std. Error	t-Statistic	Prob.
lnMPR	0.319687	0.084912	3.764913	***0.0002
lnTBR	0.138490	0.050335	2.751358	**0.0066
lnM2_	-0.030403	0.009898	-3.071705	***0.0025
lnINF	0.082622	0.033492	2.466951	**0.0146
C	1.862129	0.304662	6.112109	0.0000

*Note: \*\*\*, \*\*, \* denote the rejection of the null hypothesis of unit root at 1%, 5%, 10% alpha*

*levels respectively. Dependent variable is average lending rate (lnALR)*

Table 4.6 illustrates the long run relationship between the variables. It can be observed from the result that monetary policy rate and money supply (lnM2+) were significant at all the alpha levels but more so at a 5% significance level. However, the money supply (lnM2+) was negatively significant. This shows that graphically, the regression does not pass through the origin. In addition to that, average lending rate declines by 0.03 percent when the supply of money (m2+) increases at a 5% significance level in the long run. A tight or contractionary monetary policy embarked on by the central bank reduces the supply of money. Inferring from the law of demand and supply, a reduction in the supply of money implies a shortage hence an increase in prices by suppliers, ceteris paribus. The cost of funds as an element of price also increases. The findings are supported by Amidu (2006) whose study indicated an expansion of the economy through increase in money supply, induces banks to increase their credit portfolios. All things being equal, increase in credit portfolio implies a surplus thus cost of funds reduces, as backed by the loanable funds theory.

Inflation was also positively significant at 5% significance level, indicating that an increase in inflation led to a 0.083% increase in average lending rates. This finding is consistent with other researchers precisely Amidu (2006) who stated the reduction in demand for bank credit by firms

due to low productivity caused by high inflation. Put differently, at high lending rates influenced by high inflation rates, demand for credit falls all other things being equal. However, inflation rate was insignificant in his study and it can be attributed to the use of prime rate instead of policy rate to influence lending behavior, as adopted by this study. The primary focus of MPR is to signal all rates in the economy. Baoko, Acheampong and Ibrahim (2017) also suggested Amidu's use of OLS produced biased results more so with a short time span between 1998 and 2004. The study however employed a different and more effective model, ARDL, for its estimation.

It can also be noted that a unit change in monetary policy rate increases the average lending rates by 0.32% in the long run. Therefore the policy rate adequately served its signalling purpose by being a reference cap for the average lending rate. Therefore its significance at a 1% significance level buttresses the relationship. This indicated its importance as well as the response of lending rates to its changes as represented by a large margin compared to the other variables. This finding is in consistency with the results of Folawewo and Tennant (2008) research. However, the MPR as a policy instrument alone may not be effective in simulating the level of economic activity desired and projected in the banking sector.

Aside monetary policy rate, Treasury bill rate was the second largest fraction of coefficients that influenced lending rates by 0.13 percent. The study result is in consonance with the findings of Garr (2013) which stated that there is an upsurge in cost of funds when government rely heavily on domestic banking sector for debt financing. It also increases competition for funds through the issuance of treasury bills, due to the fact that banks prefer to lend more to the government which is relatively safe. Hence in order to lend to individuals whom are deemed riskier, the rates should be higher than the Treasury bill rates. Also Bernanke and Blinder, (1992) research findings used

three (3) month Treasury Bills rate to capture exogenous shifts in monetary policy and realized that it reduced bank loans due to high lending rates.

#### 4.7 Estimated Short Run Error Correction Model (ECM) Result.

From the bounds test conducted earlier in table 4.5, the result indicated a long run or cointegrated relationship between the variables. Engel and Granger (1987) however suggested that a valid error correction is represented in the variables when the series are co-integrated. Hence the dependent variable is able to respond to shocks in the independent variable and reconciles the short run behaviour of the variable to its long run behavior. In addition, the coefficient of the error correction model measured the speed of adjustment in gradually restoring equilibrium in the dynamic model from deviations in the long run equilibrium.

**Table 4.7: Result of Short Run Result**

Short Run Error Correction Model				
Variable	Coefficient	Std. Error	t-Statistic	Prob
D(lnMPR)	0.063190	0.020568	3.072336	0.0025
D(lnTBR)	-0.014762	0.035776	-0.412631	0.6804
D(lnTBR(-1))	-0.015195	0.060682	-0.250408	0.8026
D(lnTBR(-2))	-0.049112	0.038105	-1.288871	0.1991
D(lnM2_)	-0.006009	0.002355	-2.551960	0.0116
D(lnINF)	0.016331	0.006898	2.367468	0.0190
ECM(-1)	-0.197663	0.034154	-5.787437	0.0000
R-squared	0.943512	Mean dependent var	3.349942	
Adjust R-squared	0.940945	S.D. dependent var	0.118282	
S.E. of regression	0.028744	Akaike info criterion	-4.213351	
Sum squared residuals	0.145414	Schwarz criterion	-4.056685	
Log likelihood	398.7350	Hannan-Quinn criter.	-4.149858	
F-statistic	367.4651	Durbin-Watson stat	1.973711	
Prob(F-statistic)	0.000000			

It can be deduced from table 4.7 that the estimated coefficient of the ECM term is -0.197663. Statistically, it is negatively significant at a 95% confidence interval which presupposes its efficiency in restoring itself to equilibrium. Also it will take a speed of 19.7663% to restore any disequilibrium of within a period of one month. 19.7663% represent a relatively weak speed of adjustment in the short run. The relatively slow pass through effect suggests rigidity in the banking system which may be due to underdevelopment of the financial system. Coll et al(2005) according to the bank lending channel attributed this findings to over dependence of borrowers on banks for all their loan requirements.

The strength of the relationship of the model is described by the coefficient of determination of 94.35%. The R-squared of 94.35% explains the variations in the average lending rate caused by unit changes in the independent variables in the equation. This implies that the regression has a good fit, a strong relationship amongst the variables and hence very reliable. The study further realized the insignificance of Treasury bill on average lending rate in the short run. It was however negatively insignificant with about two lags period which implied the inability of the effect of treasury bill changes to be felt immediately in the short run. All things being held constant the higher the credit risk the higher the lending rates as cited by the loan pricing theory.

Therefore, inferring from the loan pricing theory, the insignificance of Treasury bill rate in the short run is similar to Garr (2013) insignificance of Treasury bill rate on credit risk. However, the negative relationship can be explained in relation to the diversification of banks portfolio. In order to diversify their portfolio and reduce risk in general, banks reduce lending rate to risky individuals to minimize their risk of default. Also due to relationship lending and the level of trust built with

long term serving clients and customers, banks are likely to reduce lending rates to maintain and enhance stronger ties.

Contrary to the above the monetary policy rate, inflation and money supply were significant at 5 percent alpha level in the short run. The coefficient of money supply has a negative elasticity of -0.006% and it is statistically different from zero. The money supply is however significant at both long run and short run and exerts negative pressure on both instances. In the short run a unit increase in the supply of money reduces average lending rate by 0.006. This is theoretically backed by Mishkin (2007) the author of "The economics of money, banking, and financial markets". He stated that through the liquidity effect, an expansionary monetary policy will cause real interest rate to fall. Empirically, Hung and Pfau (2008) findings also concluded that increasing money supply led to a decline in cost of credit thereby increasing credit supply.

The inflation rate were relatively more significant at a 5 % significance level and an elasticity of 0.0146 in the long run than the coefficient in the short run of 0.0190.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter provides a brief narrative of the major findings with their implication and a general conclusion of the study. The recommendations on the findings and areas for further research were discussed.

#### **5.2 Summary of Findings**

The study was conducted between the period of 2002 to 2017, using monthly data on average lending rates, monetary policy rate, Treasury bill rate, money supply and inflation. Monetary policy rate (MPR) was a proxy for monetary policy tool which was established in the year 2002. The MPR adopted was to signal all rates in the economy in view of stabilizing inflation and output. The Inflation targeting implemented by the BOG in 2007 after a transition from monetary aggregate was highly consistent with the policy rates. Per the loanable funds theory as stated earlier, money supply aside being a monetary policy tool, fluctuations directly affected the lending rates as cited by many researchers. The average lending rates was a representation of lending rates of all banks in the country as at the time of the study. The Treasury bill rate was included basically, because in order to achieve an effective monetary policy objective it must be consistent with the fiscal tool. It was also used to represent a macroeconomic variable just as inflation rate.

Therefore, this study sought to investigate the association between the MPR and average lending rates and also ascertain the pass through effect of the MPR on the lending rates. Castro and Santos

(2010) elaborated the importance of monetary policy as one of the many factors that affected lending rate in Portugal, hence the need to find its relationship in developing and emerging economy. Folawewo and Tennant (2008), also outlined the importance of financial intermediation and attributed a narrow interest rate spread as a factor that effectively propels economic development through mobilization of resources for productive purposes. These and many others emphasized the need to conduct the study.

Results of the analysis using the ARDL method exhibited a cointegrated relationship among the variables. All the variables were significant in the long run, at a 95% confidence interval. MPR changes affected lending rates more at a 1% significance level and also by a large coefficient fraction (0.32%) compared to the other variables. Also all but money supply(m2+) indicated a positive relationship between average lending rates. Therefore an increase in money supply through an expansionary monetary policy reduces the lending rates by 0.03%. Similar to monetary policy rate, 91-day Treasury bill rate also accounted for the second largest fraction of elasticity on lending rates (0.13%). The study result was in consonance with the findings of Garr (2013) which indicated an upsurge in cost of funds when government relied heavily on the domestic banking sector for debt financing. It presupposes that to some extent, the government is less efficient in collecting tax revenue hence it largely depends on cheap source of financing from treasury bills. However, in the short run, Treasury bill rate was insignificant. After continuous lag of Treasury bill rates in the short run, its changes do not affect lending rates. Added to the above, it will take a speed of 19.7663% to restore any disequilibrium in the short run within a period of one month. 19.7663% of the pass through effects represents a relative weak speed of adjustment in the short run.

Inflation rate, a macroeconomic variable was positively related to average lending rate in both short run and long run. Therefore, average lending rate increases in correspondence to an increase in inflation rate. However this was opposed by Amidu (2016) who stated its insignificance in his study.

### **5.3 Conclusion**

The findings of the study answered all its objectives by indicating a positive strong relationship between average lending rates and monetary policy rate. MPR was significant in both long and short run and had a large marginal effect on lending rates. However, in the short run the speed of adjustment was relatively slow. This implied a more rigid downward adjustment of average lending rate to changes in all the variables. A study by Matemilola, et al. (2015) attributed the asymmetry response to the underdevelopment of the financial sector.

A positive response was also experienced between inflation and Treasury bill rates on average lending rates in the long run. That notwithstanding the unavailability of monthly data on GDP and other macro-economic variables hindered an extensive macro-economic analysis. It should however be noted that the interest rate pass-through effect varies depending on the type of interest rate used in different jurisdictions. It is evidenced from literature, more especially the works of Amidu (2006) that the prime rate and inflation rate were insignificant in affecting lending rate in the long run. His finding is contrary to the result of this study. This study employed MPR which was basically implemented to assist the inflation targeting policy and signal all other rates in the economy. Therefore, some level of improvement and benefit has been observed in average lending rate with the adoption of MPR. The speed of adjustment in the short run will increase with a Well-functioning, competitive and efficient financial system (Wilson & Aziakpono, 2010). In

conclusion, efforts geared towards strengthening and creating a vibrant banking and financial system as a whole would further enhance the effectiveness of monetary policy.

#### **5.4 Recommendations**

Based on the findings above and evidenced from other literature, the following recommendations were suggested.

As stated in the chapter one, SMEs should be encouraged to seek financial assistance from Development Finance Institutions. Key among their objectives should be impact investment and incorporation of Environmental Social and Governance (ESG) issues in their production cycle in order to attract impact investors. This therefore will reduce SMEs over dependence on bank loans.

Loanable funds should be increased through diversification of the financial market alongside encouraging a strong competition amongst bank to make the banking sector healthy. The development of the money and capital market will make the collusive banking theory invalid. Therefore, banks will feel pressured to reduce lending rates when these measures are put in place.

The wide interest rate spread is indicative of some inefficiency in the banking sector and the level of development in the financial sector. Therefore, various measures that will be implemented to narrow the margin will ensure and facilitate the complete pass-through effect of the interest rates. Again, competition in the banking sector encourages banks to take on more diversified risk (i.e. investing in real estate etc.) and make them less fragile to shocks. In order to erode the margin, competition should be encouraged and legal and regulatory institutions should also be improved.

In addition, a strong correlation between Treasury bill rates and MPR reflects the heavy reliance of government on domestic financing and its inefficiency in tax revenue mobilization. Making reference to the new MPR formula, Ghana Reference Rate, the direct relationship between Treasury bill rate and lending rate implies that government will pass on its inefficiency to the domestic market. The government however is advised to adopt and implement strategic and innovative ways of mobilizing and collecting revenue to supplement its deficit gap.

On the macro level, a reduction in inflation will also reduce the interest rate spread. Countries with high inflation have underdeveloped financial systems and their high inflation rates are positively associated with wide net interest margins, (Boyd et al.2001). Therefore more attention should be given to reducing inflation rates.

### **5.5 Areas for Further Research**

The study recommends further study to be conducted on the various micro or firm characteristics of all banks in Ghana that affect average lending rates and to determine the level of development in the financial market as well.

## References

- Aban, M. J. A. C. (2013). Transmission of monetary policy through the bank lending channel in the Philippines. *International Journal of Trade, Economics and Finance*, 4(1), 37-42.
- Abdul Karim, Z., Ngah, W., Saini, W. A., & Abdul Karim, B. (2010). Bank lending channel of monetary policy: dynamic panel data evidence from Malaysia.
- Abor, J. (2004). Internationalisation and financing options of Ghanaian SMEs. *Acta Commercii*, 4(1), 60-72.
- Abor, J., & Biekpe, N. (2007). Small business reliance on bank financing in Ghana. *Emerging Markets Finance and Trade*, 43(4), 93-102.
- Abradu-Otoo, P., Amoah, B., & Bawumia, M. (2003). An investigation of the transmission mechanisms of monetary policy in Ghana: A structural vector error correction analysis. *Bank of Ghana, Working Paper*, 2.
- Acheampong, K. (2005). Bank interest rate channel of monetary policy transmission in Ghana. *Working Paper*, 10.
- Adoah, I. (2015). *Determinants of universal bank lending rate in Ghana* (Doctoral dissertation, University of Ghana).
- Afrin, S. (2017). Monetary policy transmission in Bangladesh: Exploring the lending channel. *Journal of Asian Economics*, 49, 60-80.
- Akugri, M. S., Bagah, D. A., & Wulifan, J. K. (2015). The contributions of small and medium scale enterprises to economic growth: a cross-sectional study of zebilla in the bawku west district of northern Ghana. *European Journal of Business and Management ISSN*, 2222-1905.
- Amidu, M. (2006). The link between monetary policy and banks lending behaviour: the Ghanaian case. *Banks and Bank Systems*, 1(4), 38-48.
- Appelt, K. (2016). Keynes' Theory of the Interest Rate: A Critical Approach. *Theory, Methodology, Practice*, 12(1), 3.
- Aziakpono, M. J., & Wilson, M. K. (2010). Interest Rate Pass-Through and Monetary Policy Regimes in South Africa 12.

- Baoko, G., Acheampong, I. A., & Ibrahim, M. (2017). Determinants of bank credit in Ghana: A bounds-testing cointegration approach. *African Review of Economics and Finance*, 9(1), 33-61.
- Bernanke, B. S., & Blinder, A. S. (1992). The federal funds rate and the channels of monetary transmission. *The American Economic Review*, 901-921.
- Bernanke, S., & Blinder, S. (1988). Credit, Money and Aggregate Demand. *The American Economic Review Papers and Proceedings*, 435-439.
- Borio, C. E., & Fritz, W. (1995). The response of short-term bank lending rates to policy rates: a cross-country perspective.
- Castro G. and C. Santo (2010), "Bank interest rates and loan determinants" Economic bulletin, Banco de Portugal.
- Coll, A. A., Torres, E., & Santander, E. (2005). The bank lending channel in venezuela: evidence from bank level data. *Banco Central de Venezuela*.
- Cox, J. C., Ingersoll Jr, J. E., & Ross, S. A. (2005). A theory of the term structure of interest rates. In *Theory of Valuation* (pp. 129-164).
- De Bondt, G. J. (2005). Interest rate pass-through: empirical results for the Euro Area. *German Economic Review*, 6(1), 37-78.
- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.
- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.
- Folawewo, A. O., & Tennant, D. (2008, July). Determinants of interest rate spreads in Sub-Saharan African countries: A dynamic panel analysis. In *A paper prepared for the 13th Annual African Econometrics Society Conference* (pp. 9-11).
- Garr, D. K. (2013). Determinants of credit risk in the banking industry of Ghana. *Developing Country Studies*, 3(11), 2225-0565.

- Georgievska, L., Kabashi, R., Manova-Trajkovska, N., Mitreska, A., & Vaskov, M. (2011). Determinants of lending interest rates and interest rates spreads. In *InBank of Greece, Special Conference Paper* (Vol. 9).
- Gertler, M., & Gilchrist, S. (1993). The role of credit market imperfections in the monetary transmission mechanism: arguments and evidence. *The Scandinavian Journal of Economics*, 43-64.
- Gockel, A. F., & Mensah, S. (2006). Commercial bank interest rate spread in Ghana: determinants and policy implications. *Trade and Investment Program for a Competitive Export Economy: Accra, Ghana*.
- Hung, V., & Pfau, D. (2008, February). *Var Analysis of The Monetary Transmission Mechanism In Vietnam*. Retrieved from <http://www.vdf.org.vn/workingpapers/vdfwp081>
- Jeong, H.-W. (1995). Liberal Economic Reform in Ghana: *jstor*, pp. 82-104.
- Kamau, M. (2015). Effect Of Monetary Policy on Commercial Banks Lending Rates in Kenya.
- Kelilume, I. (2014). Effects of Monetary Policy Rate On Interest Rates In Nigeria. *International Journal Of Business and Finance Research*.
- Kovanen, A. (2011). Monetary Policy Transmission in Ghana: Does the Interest Rate Channel Work?.
- Kwakye, K. (2010). High Interest Rate In Ghana; A Critical Analysis. Institute of Economic Affairs-Ghana.
- Ladime, J., Sarpong-Kumankomah, E., & Osei, K. A. (2013). Determinants of bank lending behavior in Ghana. *Journal of Economics and Sustainable Development*, 4(17), 42- 47.
- Matemilola, B. T., Bany-Ariffin, A. N., & Muhtar, F. E. (2015). The impact of monetary policy on bank lending rate in South Africa. *Borsa Istanbul Review*, 15(1), 53-59.
- Matouseka, R., & Solomon, H. (2015). Bank lending channel and monetary policy in Nigeria. *Research in International Business and Finance*.
- Mbowe, E. (2015, September). Monetary Policy Rate Pass-Through To Retail Bank Interest Rates In Tanzania. Tanzania.

- Mishkin, F. S. (1995). Symposium on the monetary transmission mechanism. *Journal of Economic perspectives*, 9(4), 3-10.
- Mishkin, F. S. (2007). *The economics of money, banking, and financial markets*. Pearson education.
- Ngugi, W. (2001). An empirical analysis of Interest Rate Spread in Kenya(106)Nairobi. *African Economic Research Consortium*.
- Nkegbe, P. K., & Ustarz, Y. (2015). Banks performance in Ghana: Trends and determinants. *Ghana Journal of Development Studies*, 12(1-2), 33-52.
- Obeng, S. K., & Sakyi, D. (2017). Macroeconomic determinants of interest rate spreads in Ghana. *African Journal of Economic and Management Studies*, 8(1), 76-88.
- Olokoyo, F. O. (2011). Determinants of commercial banks' lending behavior in Nigeria. *International Journal of Financial Research*, 2(2), 61.
- Ross, A., Ingersoll, J., & Cox, J. (2005). The Theory Of Term Structure Of Interest Rate. *Econometrica*.
- Sanusi, A. (2010). Interest rate pass-through and the efficiency of monetary policy in Nigeria: 2002-2010.
- Sheriff, I., & Amoako, G. (2014). Macroeconomic determinants of interest rate spread in Ghana: Evidence from ARDL modelling approach. *Journal of Finance and Bank Management*, 2(2), 115-132.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American economic review*, 71(3), 393-410.
- Ustarz, Y., & Nkegbe, K. (2015). Banks Performance In Ghana:Trends and Determinants. *Ghana Journal of Development Studies*.