



**DETERMINANTS OF LENDING BEHAVIOR OF BANKS:
A CASE STUDY ON COMMERCIAL BANKS OF ETHIOPIA**

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Statement of Certification

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Statement of Declaration

I, Amano Getahun, have carried out independently a research work on — Determinants of lending behavior of banks: A case study on commercial banks of Ethiopia in partial fulfillment of the requirement of the M.SC program in Accounting and Finance with the guidance and support of the research advisor.

This study is my own work that has not been submitted for any degree or diploma program in this or any other institution.

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Abstract

This study investigated the determinants of commercial banks' lending behavior in the Ethiopian context. The study aimed to test and confirm the effectiveness of the common determinants of commercial banks lending behavior and how it affects the lending behavior of commercial banks in Ethiopia. Balanced fixed effect panel regression was used for the data of eight commercial banks in the sample covered the period from 2001 to 2013. Seven factors affecting banks loan and advance were selected and analyzed. The results of panel data regression analysis showed that volume of deposit and bank size had positive and significant impact on loan and advance. Liquidity ratio and interest rate had negative and significant impact on loan and advance. Cash reserve requirement, and inflation rate had positive and significant impact on loan and advance but the coefficient sign was not as expected. Real GDP growth rate had statistically insignificant impact on bank's loan and advance. The study then suggests that commercial banks should focus on mobilizing more deposits as this will enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

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List of Acronyms

AIB: Awash International Bank

BUIB: Buna International Bank

BOA: Bank of Abyssinia

CAR - Capital Adequacy Ratio

CBB: Construction and Business Bank

CBE: Commercial Bank of Ethiopia

CC: Correlation Coefficient

CI: Condition Index

CLRM: Classical Linear Regression Model

DB: Dashen Bank

DW: Durbin-Watson

FEM: Fixed Effect Model

GDP: Gross domestic Product

INF: General inflation rate

JB: Jarque-Bera

IR: Interest rate

LR: Liquidity ratio

LOA: Loan and advance

MoFED: Ministry of Finance and Economic Development

NBE: National Bank of Ethiopia

NIB: Nib international Bank

NPLR - Nonperforming loan ratio

OLS: Ordinary Least Square

REM: Random Effect Model

ROE - Return on Equity

RR: Reserve requirement

UB: United Bank

VD: Volume of deposit

VIF: Variance inflation factor

WB: Wogagen Bank

CHAPTER ONE

1. Introduction

In human societies, since the evolution of money, there have always existed those who possess money in excess of their immediate needs (surplus economic unit) and those whose current possession cannot finance their economic activities (deficit economic unit). The realization by the surplus economic unit that their excess can be used beneficially to meet the shortfalls experienced by the deficit economic unit led to the introduction of a credit system. This system was initially characterized by lenders (surplus units) and borrowers (deficit unit) having to search out themselves and deal directly... Direct financing (Akpanuko and Acha 2010). Indirect financing includes the aggregation of deposits from various households, firms and government by commercial banks for lending to the deficit unit; the repayment of the loan is made to the bank which also stands ready to redeem deposits withdrawals by the surplus unit.

Lending which may be on short, medium or long-term basis is one of the services that commercial banks do render to their customers. In other words, banks do grant loans and advance to individuals; business organizations as well as government in order to enable them embark on investment and development activities as a mean of aiding their growth in particular or contributing toward the economic development of a country in general. Thus, banks lending activities generate economic growth through resources provision for real investment (Mckinnon, 2009). According to Adedoyin and Sobodun (1991), “lending is undoubtedly the heart of banking business. Therefore, its administration requires considerable skill and dexterity on the part of the bank management”. While a bank is irrevocably committed to pay interest on deposits it mobilized from different sources, the ability to articulate loanable avenues where deposit funds could be placed to generate reasonable income; maintain liquidity and ensure safety requires a high degree of pragmatic policy formulation and application.

Commercial banks are the most important savings, mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and development. In performing this role, it must be realized that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments. Therefore, no matter the sources of the generation of income or the economic policies of the

country, commercial banks would be interested in giving out loans and advances to their numerous customers bearing in mind, the three principles guiding their operations which are, profitability, liquidity and solvency. However, commercial banks decisions to lend out loans are influenced by a lot of factors such as volume of deposits, interest rate, and cash reserve requirement and liquidity ratio to mention a few (Olokoyo 2011).

Moreover, the banking industry is one critical component of the financial system in developing countries capable of facilitating capital accumulation and economic processes. This is possible through efficient financial intermediation. The banks mobilize funds from the surplus spending units in order to bring financial costs down. Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond and Rajan, 1998). This transformational process of banks' activity is at best influenced by a host of factors, namely, macroeconomic, bank level (Peek and Rosengreen, 1995) and industry level characteristics (Boot and Thakor, 2000).

In the view of Nwankwo (2000), "credit constitutes the largest single income-earning asset in the portfolio of most banks. This explains why banks spend enormous resources to estimate, monitor and manage credit quality". This is understandably, a practice that impact greatly on the lending behavior of banks as large resources are involved.

Chodechai (2004) while investigating factors that affect interest rates, degree of lending volume and collateral setting in the loan decision of banks, says:

Banks have to be careful with their pricing decisions as regards to lending as banks cannot charge loan rates that are too low because the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from some borrowers that do not pay. Moreover, charging too high loan rates may also create an adverse selection situation and moral hazard problems for the borrowers.

Study becomes imperative because commercial banks in Ethiopia need to understand the determinants of lending behavior so as to manage their huge assets in terms of their loans and advances. For the banks to balance their main objectives of liquidity, profitability and solvency, lending must be handled effectively and the banks must behave in a way that their potential customers are attracted and retained. This study tried to provide insight into the best lending practice and behavior.

Particularly to the knowledge of the researcher in Ethiopia there is no empirical study done so far on determinants of commercial bank lending behavior.

The major objective of this paper was to verify the effectiveness of the common determinants of commercial banks lending and how it affects the lending of commercial banks in Ethiopia. The paper has five sections; following this introduction is the literature review as section two, section three is the methodology of the study while analysis of data and the conclusion make up the last two sections.

1.2. Statement of the problem

Commercial banks are the most important savings, mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and development. In performing this role, it must be realized that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments (Olumuyiwa 2012).

Currently the banking business is so sensitive because more of their income (revenue) will be generated from credit (loan) given to their customers (Jeoitta Colquitt, 2007). This credit creation process exposes the banks to high credit risk which leads to loss. Therefore, without understanding determinants of lending behavior good bank performance or profit would be unthinkable.

Commercial bank loans for businesses and non-financial institution have always played an important and crucial role within an economy. These loans give a chance to individuals and businesses to expand and develop their business, which in turn will increase output and employment. An increase in output and employment will then result in an increase of welfare for a country or region. Although there are many other variables that may cause the increase of welfare, commercial bank loans are among one of the most important factors that contribute to development. One example of an important commercial bank loan is for mortgage payments, which help people by giving loans to pay off for a house and in which in return they have to pay interest for the mortgage given. However, there is always a risk of default from the borrowers. The financial crisis that hit the world by surprise in 2007 is an example of how loans, if mismanaged could cause devastating implications. The financial crisis that was triggered by the

subprime mortgage in the United States resulted in a chain effect to the rest of the world, with devastating effects to the world's economies. The impact of the crisis has spread fear amongst banks to be very careful with their loans. As an example, in the United States, banks are reported to have sufficient assets to give out loans but apparently not willing to do so. Therefore, a shortage or unwillingness of commercial banks to give out loans could have a negative impact on the output and employment of a region or country and therefore will result in a decrease of growth and development. It is by this realization of the importance of commercial bank loans have on a country or region that drives the purpose of this study.

Therefore, no matter the sources of the generation of income or the economic policies of the country, commercial banks would be interested in giving out loans and advances to their numerous customers bearing in mind, the three principles guiding their operations which are, profitability, liquidity and solvency.

However, commercial banks decisions to lend out loans are influenced by a lot of factors such as the volume of deposits, level of domestic and foreign investment, interest rate, and cash reserve requirement and liquidity ratio to mention a few (Olokoyo 2011).

Moreover, the banking industry is one critical component of the financial system in developing countries capable of facilitating capital accumulation and economic processes. This is possible through efficient financial intermediation. The banks mobilize funds from the surplus spending units in order to bring financial costs down. Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond and Rajan, 1998). This transformational process of banks' activity is at best influenced by a host of factors, namely, macroeconomic, bank level (Peek and Rosengreen, 1995) and industry level characteristics (Boot and Thakor, 2000).

The principal profit-making activity of commercial banks is making loans to its customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of its community (Reed and Gill, 1989). Lending represents the heart of the industry. Loans are the dominant asset and represent 50-75 percent to total amount at most banks, generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006).

The commercial banks lending has significantly played crucial roles in igniting industrialization in every economy, by facilitating the mobilization of capital which oils the wheels of economic production. And those well functioning banks spur technological innovations by identifying and funding entrepreneurs assessed to have brighter chances of successful implementing innovative products and production process. But the sound and viable functioning of commercial banks is adversely affected by the choice of certain policy instruments for the regulation of banking operations. Such includes a rigidly administered interest rate structure, Directed credit, unremunerated reserve requirements and stabilizing liquidity control measures; the volume of cash in the banks vault also determines its ability to grant advances. Since cheques have to be met in cash in many cases, they should stock reasonable quantity of cash to meet customers demand (Olumuyiwa 2012).

The banking industry in Africa and Ethiopia in particular forms a strategic hub of the financial system. Lending decisions by banks cannot be overlooked as they are the principal providers of funds to governments, corporate bodies and individuals as a whole. Existing literature provides paucity of empirical evidence on bank lending behaviour in emerging markets like Ethiopia. In a developing economy like Thailand, Suwanaporn (2003) provides that banks consider risk and relationship factors in their bank lending decisions. This work tries to fill this gap and find evidence of the determinants of bank lending behaviour in Ethiopia. Specifically, it investigates the effect of bank specific and macroeconomic factors on bank lending behaviour.

Particularly to the knowledge of the researcher in Ethiopia there is no empirical study done so far on determinants of commercial bank lending behavior. Thus, this study was aimed to contribute to the current literature by providing some evidence on the determinants of commercial bank's lending behavior.

1.3. Objective of the study

General objective

The main objective of the study was to investigate the impact of bank specific and macroeconomic determinants of commercial banks' lending behavior in Ethiopia.

Specific objectives

Having the aforementioned problem and general objective in mind, the researcher addressed the following specific research objectives:

- Examining the impact of volume of deposit, liquidity ratio, and bank size on lending behavior of Ethiopian commercial banks;
- Analyzing the significance of bank specific determinants of lending behavior of Ethiopian commercial banks ;
- Examining the impact of lending interest rate, cash reserve requirement ratio , economic growth, and inflation on lending behavior of Ethiopian commercial banks; and
- Analyzing the significance of macroeconomic determinants of lending behavior of Ethiopian commercial banks.

1.4 Research hypotheses

The main arguments of the study were synthesized into the following hypothesis:

H1: Volume of deposit has positive and significant impact on banks' loans and advances

H2: Bank size has positive and significant impact on banks' loans and advances

H3: Liquidity ratio has negative and significant impact on banks' loans and advances

H4: Cash reserve requirement has negative and significant impact on banks' loans and advances

H5: Interest rate has negative and significant impact on banks' loans and advances

H6: Gross Domestic Product has positive and significant impact on banks' loans and advances

H7: Inflation rate has negative and significant impact on bank's loan and advance

1.5. Research methodology

Quantitative method of approach used to meet the objective of the study and to answer research questions and to test hypotheses under it. Among the quantitative research approach strategies of enquiry, survey method was adopted by the study. According to Creswell (2009), this approach enables the researcher to test objective theories in the real world by constructing the cause and

effect relationship between variables and promote the replication of research. In this study, this approach will enable to test the determinants of commercial bank's lending behavior.

Balanced fixed effect panel regression was used for the sample of eight commercial banks having at least thirteen year's experience (i.e. from 2001 to 2013). Structured document analysis was used to collect the necessary data from audited financial statements of each commercial bank in the sample for bank specific factors and annual reports of National Bank of Ethiopia/NBE and Ministry of Finance and Economic Development/ for macro factors. And the data was analyzed by using Eviews 6 soft ware package.

1.6. Scope of the study

The scope of the study was limited to verify the effectiveness of the common determinants of commercial banks lending behavior and how it affects the lending of commercial banks in Ethiopia 2001 to 2013 for eight commercial banks in the sample.

1.7. Significance of the study

Banks are one of the contributors of a country's growth through lending money to investors and the business community. Lending also has important function for commercial banks. Its contribution to asset and income portfolio is very high in banking industry. Therefore, understanding the determinants of lending behavior will help them enhance lending performance.

Also, it will help management of banks to make them aware and to give due attention about the factors that affect lending. The findings of this study will be important to understand the behavior and tendencies of commercial banks in distributing loans and credits to the public.

Moreover, the study will have great contribution to the existing knowledge in the area of determinants of commercial bank lending behavior in the context of Ethiopia. This in turn contributes to the well being of the financial sector of the economy and the society as a whole. Therefore, the major beneficiaries from this study will be commercial banks, regulatory bodies, the academic staff of the country and the society as a whole in the country.

Finally, this study will also be used as a basis for any future study that will need to explore on some other concerns which was not covered in this study.

1.8. Organization of the study

This thesis was organized in five chapters. Chapter one provided the general introduction about the whole thesis. Chapter two described the review of related literatures. Chapter three provided detail description of the methodology employed by the thesis.

Chapter four contains data presentation, analysis and interpretation. Finally, the last chapter concluded the total work of the thesis and gave relevant recommendations based on the findings.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2. Literature Review and Theoretical Framework

This chapter was focused on the review of relevant theoretical and empirical literatures on the determinants of bank lending behavior. This review of the literature established the framework for the study and clearly identified the gap in the literature that helps to formulate the research hypotheses for the study.

The chapter had five broad sections. Section 2.1 discussed about the theoretical aspects of banks lending behavior, Section 2.2 discussed determinants of commercial bank lending behavior – Theory, 2.3 extensively explained important empirical studies on the area of bank lending behavior, section 2.4 assessed related empirical studies in Ethiopia. Finally, section 2.5 briefly discussed knowledge gap in the relevant literatures.

Introduction

Lending is the provision of resources (granting loan) by one party to another. The second party doesn't reimburse the first party immediately there by generating a debt, and instead arranges either to repay or return those resources at a later date. Banks function as financial intermediaries, collecting funds from savers in the form of deposit and then supplying to borrowers as loans. Those functions benefit both the banks and the borrowers.

One of the major functions of any commercial bank is providing loan to the business society. Banks collect money from those who have excess money and lend it to others who need money for different purpose. Therefore, banks intermediary function play vital role in the economic activity. Athavale et al. (undated) in their study in the U.S using firm growth model classified different theories related to banks roles. The first theory assigns banks a unique role in the resolution of information asymmetry means banks help financial market to overcome asymmetric information by screening, contracting with and monitoring borrowers. The second theory, monetary theory, assigns banks a unique role in money creation and the transmission of monetary policy. In addition, they showed banks willingness and ability to lend.

According to Athavale et al. (undated) banks willingness depends on the project's payoffs and a moral rectitude of borrowers, while bank ability to lend depends on the adequacy of banks capital and monetary policy.

Banks accept customer deposits and use those funds to give loans to other customers or invest in other assets that will yield a return higher than the amount bank pays the depositor (McCarthy et al., 2010). It follows that customers' deposit is the primary source of bank loan and hence, increasing or guaranteeing deposits directly has a positive effect on lending.

The principal profit- making activity of commercial banks is making loans to its customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of its community (Reed and Gill, 1989). Lending represents the heart of the industry. Loans are the dominant asset and represent 50-75 percent to total amount at most banks, generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006).

Cicfa and Hincu (2009) after analyzing different performance evaluation methods and risks in Romania presented the usefulness of commercial banks. Bank represents the core of the credit for any national economy. In turn, the credit was found to be the engine that put in motion the financial flows that determine growth and economic development of a nation. As a result, any efficiency in the activities of commercial banks has special implication on the entire economy of any country.

Loan is the most important asset of commercial banks. McCarthy et al. (2010) described that for most of the 10 largest U.S banks in 2007 and 2008, loans were the largest asset followed by investments. Their analysis focused primarily on magnitudes and percentages of investments and loans of 10 largest banks. They also showed that bank bailout and credit crunch could change the results of the year 2009 recession.

To create sustainability on deposits and alternative sources of loans, banks created different solutions. The first method is using insurance guarantee for deposits and second method is selling securities. Opiela (2008) showed that banks with partial guarantees have a stronger loan response to monetary policy than banks with full guarantees. Furthermore, the weak response of the fully guaranteed banks attributed to their ability to raise low-reserve, uninsured time deposits

relative to partially covered banks in Poland. Keeton (1993) indicated that the willingness of banks to fund loans by selling securities or issuing large certificate of deposits (CDs) insulates bank lending from changes in deposits.

A lot has been reviewed in terms of lending activities of various commercial banks. Some opinions deliberated on the factor responsible for banks willingness to extend much credit to some sector of the economy, while some discussed effect of such extension of credits on productivity and output. Most of these earlier studies agreed on the fact that it is logical for banks to have some basic lending principles or consideration to act as a check in their lending activities. It is imperative to highlight and consider some factor that economist and professionals alike have proposed as virtually significant in explaining the determinants of commercial banks lending behavior.

In the view of Nwankwo (2000), “credit constitutes the largest single income-earning asset in the portfolio of most banks. This explains why banks spend enormous resources to estimate, monitor and manage credit quality”. This is understandably, a practice that impact greatly on the lending behavior of banks as large resources are involved.

Chodechai (2004) while investigating factors that affect interest rates, degree of lending volume and collateral setting in the loan decision of banks, says:

Banks have to be careful with their pricing decisions as regards to lending as banks cannot charge loan rates that are too low because the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from some borrowers that do not pay. Moreover, charging too high loan rates may also create an adverse selection situation and moral hazard problems for the borrowers.

According to Adedoyin and Sobodun (1991), “lending is undoubtedly the heart of banking business. Therefore, its administration requires considerable skill and dexterity on the part of the bank management”. While a bank is irrevocably committed to pay interest on deposits it mobilized from different sources, the ability to articulate loan able avenues where deposit funds could be placed to generate reasonable income; maintain liquidity and ensure safety requires a high degree of pragmatic policy formulation and application.

Ezirim (2005) further stressed that “Bank lending decisions generally are fraught with a great deal of risks, which calls for a great deal of caution and tact in this aspect of banking operations. The success of every lending activity to a great extent therefore, hinges on the part of the credit analysts to carry out good credit analysis, presentation, structuring and reporting.

Ojo (1999), in a study on roles and failure of financial intermediation by banks in Nigeria revealed that, “commercial banks can lend on medium and short term basis without necessarily jeopardizing their liquidity. If they must contribute meaningfully to the economic development, the maturity pattern of their loans should be on a long term nature rather than of short term period”. However, Oloyede (1999) claimed that “it is generally acknowledged that commercial banking by its nature is highly prone to volatility and fragility – whether arising from exogenous shocks or endogenous policy measures – and therefore, amenable to regulations and supervision”. The forms of regulation vary, but in general, they embrace statutory regulations or rules of behavior that may be administratively imposed or that can be guided through a market-oriented approach.

Similarly, Chizea (1994) asserted that “there are certain aspects of fiscal and monetary policies which could affect the decision of the discerning and informed public to patronize the bank and the lending behavior of commercial banks. Paramount amongst these measures is what could be called the interest rate disincentive. Interest rates have been so low in the country that they are negative in real terms”. As inflation increased, the purchasing power of money lodged in deposit accounts reduce to the extent that savers per force pay an inflation tax. There is also the fear that the hike in interest rates would increase inflation rates and make a negative impact on the rate of investment. Usman (1999) also supported this position by stating that “a major regulation affecting commercial banks lending in Nigeria is the restriction on the amount of interest they are allowed to pay on deposits in an effort to attract additional depositors and the interest they charge on their fund based activities”.

Goldfeld and Chandler (1986) claimed that, “commercial banks must pay more attention to liquidity than many other types of financial institutions such as life insurance companies. This results from the high turnover of their debt liabilities. A large part of the gross out payments by a bank is met from current gross receipt of funds in the normal course of business”. Similarly, John (1993) commented that, “the ability of commercial banks to promote growth and development

depends on the extent to which financial transactions are carried out with trust and confidence and least risk". They require safe and sound banking practices. Where commercial banks indulge in unsafe and unsound banking practices, the confidence and trust, which the public reposes in them, may be threatened.

Usman (1999), commenting on the factors that affect commercial banks' lending behavior said that, "the sound and viable functioning of commercial banks in Nigeria is adversely affected by the choice of certain policy instruments for the regulation of banking operations. Such instruments include a rigidly administered interest rate structure, directed credit, unremunerated reserve requirements and stabilizing liquidity control measures like the stabilization securities of the past". Ituwe (1985) also asserted that, "a bank's ability to grant further advances is checked by the available cash in its vault. Customers' drawings are paid in two ways, either in cash or through bank accounts. Since cheques have to be met in cash in many cases, commercial banks, therefore, have to stock reasonable quantity of cash to meet customers' demands". Where a bank grants advances in excess of its cashing ability, the bank soon runs into difficulty in meeting its customers' cash drawings. Chodechai (2004) further stressed that "banks' lending decisions are also influenced by the past relationship with the borrowers". Past relationship according to him can help banks to obtain more private information, leading to a more accurate understanding of the borrower's business and financial situation.

Carletti et al (2006) however, discussing on multiple-lending is of the opinion that banks choose to share lending whenever the benefit of greater diversification, in terms of higher cost per project monitoring dominates the cost of free-riding and duplication of efforts.

2.1 Theoretical frame work

2.1.1 Loan Pricing Theory

Banks cannot always set high interest rates, e.g. trying to earn maximum interest income. Banks should consider the problems of adverse selection and moral hazard since it is very difficult to forecast the borrower type at the start of the banking relationship (Stiglitz and Weiss, 1981). If banks set interest rates too high, they may induce adverse selection problems because high-risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behavior or so called borrower moral hazard since they are likely to

take on highly risky projects or investments (Chodecai, 2004). From the reasoning of Stiglitz and Weiss, it is usual that in some cases we may not find that the interest rate set by banks is commensurate with the risk of the borrowers.

2.1.2 Firm Characteristics Theories

These theories predict that the number of borrowing relationships will be decreasing for small, high-quality, informationally opaque and constraint firms, all other things been equal. (Godlewski & Ziane, 2008)

2.1.3 Theory of Multiple-Lending

It is found in literature that banks should be less inclined to share lending (loan syndication) in the presence of well developed equity markets and after a process consolidation. Both outside equity and mergers and acquisitions increase banks' lending capacities, thus reducing their need of greater diversification and monitoring through share lending. (Carletti et al, 2006; Ongene & Smith, 2000; Karceski et al, 2004; Degryse et al, 2004).

2.1.4 Hold-up and Soft-Budget-Constraint Theories

Banks choice of multiple-bank lending is in terms of two inefficiencies affecting exclusive bank-firm relationships, namely the hold-up and the soft-budget-constraint problems.

According to the hold-up literature, sharing lending avoids the expropriation of informational rents. This improves firms' incentives to make proper investment choices and in turn it increases banks' profits (Von Thadden, 2004; Padilla and Pagano, 1997). As for the soft-budget-constraint problem, multiple-bank lending enables banks not to extend further inefficient credit, thus reducing firms' strategic defaults. Both of these theories consider multiple-bank lending as a way for banks to commit towards entrepreneurs and improve their incentives. None of them, however, addresses how multiple-bank lending affects banks' incentives to monitor, and thus can explain the apparent discrepancy between the widespread use of multiple-bank lending and the importance of bank monitoring. But according to Carletti et al (2006), when one considers explicitly banks' incentives to monitor, multiple-bank lending may become an optimal way for banks with limited lending capacities to commit to higher monitoring levels. Despite involving free-riding and duplication of efforts, sharing lending allows banks to expand the number of

loans and achieve greater diversification. This mitigates the agency problem between banks and depositors, and it improves banks' monitoring incentives. Thus, differently from the classical theory of banks as delegated monitors, their paper suggested that multiple-bank lending may positively affect overall monitoring and increase firms' future profitability.

2.1.5 The Signaling Arguments

The signaling argument states that good companies should provide more collateral so that they can signal to the banks that they are less risky type borrowers and then they are charged lower interest rates. Meanwhile, the reverse signaling argument states that banks only require collateral and or covenants for relatively risky firms that also pay higher interest rates (Chodechai, 2004; Ewert and Schenk, 1998).

2.1.6 Credit Market Theory

A model of the neoclassical credit market postulates that the terms of credits clear the market. The theory postulates that if collateral and other pertinent restrictions remain given, then it is only the lending rate that determines the amount of credit that is dispensed by the banking sector. Therefore with an increasing demand for credit and a fixed supply of the same, interest rates will have to rise. Any additional risk to a project being funded by the bank should be reflected through a risk premium that is added to lending rate to match the increasing risk of default. Subsequently, there exist a positive relationship between the default probability of a borrower and the interest rate charged on the advance. It is thus believed that the higher the failure risks of the borrower, the higher the interest premium (Ewert et al, 2000).

Although this theory does not explicitly discuss how collateral would effect on the risk premium, it creates the impression that collateral has no effect on lending rate, and if a risky borrower would wish to face the same lending rate as a borrower with a lower risk, then all that is required is to pledge more collateral to lower his risk profile and therefore enjoy a lower risk premium. This brings about the „moral hazard“ and „adverse selection“ phenomena, firstly because of information asymmetry existing between the lender and borrowers. The borrower has a more accurate assessment of the risk profile of this investment that is not known by the lender and thus may perform secret actions to increase the risk of his investment without the realization of the lender. The adverse selection problem appears as lenders raise their interest rates to shield

themselves from default and on the other hand attract only high risk borrowers and eliminate low risk borrowers (Mason and Roger, 1998).

2.2 Determinants of commercial bank lending behavior - Theory

The sources of fund for lending are reserve, deposits and capital. All these sources may be affected by different factors and would have direct influence on lending. Since lending is the principal function of banking industry, the management of banks should give due attention, analyze and take the necessary measures on time on internal and external factors that affect lending. Without lending banks' incomes especially interest income would highly deteriorate and affect the overall performance of banks.

Bank specific factors

2.2.1 Volume of deposits

The lending activity is made possible only if the banks can mobilize enough funds from their customers. Since commercial banks depend on depositor's money as a source of funds, it means that there are some relationships between the ability of the banks to mobilize deposits and the amount of credit granted to the customers (Tomola 2013).

As total deposit increase the total advance and loan increases proportionally (Ajay 2007). An increase in deposit of a bank will improve its ability to lend more funds to its customers.

As Jayaratne and Morgan (1997), lending and deposits move together because faster deposit growth signals growing demand for loans.

2.2.2 Bank size

According to the "too big to fail" argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta et al. 2007). Therefore, "too big to fail" status of large banks could lead to moral hazard behavior and excessive risk exposure. If big banks are seeing themselves as "too big to fail", their motivation to hold liquid assets is limited and illiquid asset which is loan increases. Hence, there can be positive relationship between bank size and illiquidity. Moreover, since small banks are likely to be focused on traditional intermediation activities and transformation activities (Rauch

et al. 2008; Berger and Bouwman 2009) they do have small amount of liquidity. Hence, there can be positive relationship between bank size and illiquidity.

Moreover, bank size is considered as an important determinant of bank lending decision (Berger and Udell, 2006). Berger and Udell (2006) provide that large and complex banks tend to lend few loans to small scale firms. Stein (2000) explains that small banks have comparative advantages in producing soft information whereas large banks also have comparative advantages in lending based on hard information. On the other hand, when large and complex banks are able, through technical expertise, to process soft information about small scale firms, then there would be positive relationship between bank size and lending.

2.2.3 Liquidity ratio

Comptroller's Handbook (1998), states that lending is the principal business activity for most commercial banks. The loan portfolio is typically the largest asset and the predominate source of revenue. As such, it is one of the greatest sources of risk to a bank's safety and soundness. Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. According to Pilbeam (2005, p. 42), in practice the amount of liquidity held by banks is heavily influenced by loan demand that is the base for loan growth. If demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Therefore loans and advances have negative impact on banks liquidity and vice versa.

Macro economic factors

2.2.4 Interest rate

Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). Kashyap and Stein's (2000) study in U.S.A noted that if contraction monetary policy reduces loan supply, it would reduce more at banks with less liquid balance sheet. The more liquid banks can protect their loan portfolios by drawing down their buffer stock of cash and securities. To illustrate this argument the study made in Turkey by Sengonol and Thorbecke (2005) showed that contraction

policy did reduce the supply of bank loan in Turkey. Both Kashyap and Stein (2000) in the U.S.A and Senngnol and Thorbecke (2005) in Turkey used kashyap - Stein (K-S) a two-step approach to test monetary policy effects on loan supply. Keeton (1993) found that monetary policy not only affect bank lending directly, by changing deposits, but also indirectly, by changing the return on securities and the cost of CDs. Therefore, if central bank reduces the rate, banks become reluctant to provide loan to firms and vice versa McKinnon (2009). Moreover, Interest rate changes also have impact on lending. If central bank reduces the rate, banks become reluctant to provide loan to firms. McKinnon (2009) noted that by the end of the year 2008 the interest rate in U.S.A derived to zero and interbank market became paralyzed. This led U.S.A banks to create huge excess reserves and did not stimulate new lending to household and non bank firms because of near to zero interest rates. Despite banks are not profitable to give lending during interest rate declines, firms and households on the other hand increased their demand to get credit. The Economist Intelligence unit (1999) reported that in the U.S.A one of the factors that increased the demand of credit in September to November 1998 was interest rate cut by U.S.A Federal Reserve.

In addition to this, monetary policy, through a prime rate (Central Bank's rate) has a transmission mechanism on interest rates in the financial market (Borio and Fritz, 1995). Bank lending rates are mostly seen as being rigid for the reason that they do not move in tandem with the markets. A number of explanations have been suggested to account for the rigidity in bank lending rates. In the case of loans, the rigidity has been as a result of the rationing of credit to borrowers owing to the fact that there are problems of asymmetric information (Blinder and Stiglitz, 1983). Indeed, financial markets are not perfect; in the presence of adverse selection and moral hazard issues, banks are more likely to opt for credit rationing than to adjust their lending rates in a situation where there has been an upward adjustment of interest rates by the central bank. It may also be possible that when large banks capture large market share, the impact of tight monetary policy on bank lending will be minimal. However, Berger and Udell (1992) could not find concrete support for the rationing of credit as a reason for the rigidity of lending rate. Therefore, if central bank reduces the rate, banks become reluctant to provide loan to firms and vice versa McKinnon (2009).

2.2.5 Cash reserve requirement

The liquidity of banks could be controlled by the minimum reserve requirements given by each respective countries central bank in order to protect the bank against liquidity rush from its depositors in certain economic conditions. Goldfeld and Chandler (1986) support this assumption by stating: “Commercial banks must pay more attention to liquidity than many other types of financial institution such as life insurance companies. This results from the high turnover of their debt liabilities. A large part of the gross out payments by a bank is met from current gross receipt of funds in the normal course of business.” The reserve requirement ratio also plays an important role in a banks capacity to give out loans and credit. The assumption here is that the higher the reserve requirements from the central bank, the lower the amount of credits and loans a bank is willing to give to the public.

2.2.6 Gross Domestic Product

A strong economic condition measured by GDP, as motivating factor to banks has statistically significant impact on issuance of more private credit to businesses. A strong economic condition creates more demand for goods and services which lead to more investment in different sectors hence increase the per capita income as well as the savings, collectively these factors convince to banks to issue more private credit (kashif and mohammed 2008).

In a recent study Guo and Stepanyan (2011) indicated that domestic and foreign funding is positively associated with the credit growth. The stronger economic growth leads to higher credit growth.

2.2.7 The rate of inflation

A growing theoretical literature describes mechanisms whereby even predictable increases in the rate of inflation interfere with the ability of the financial sector to allocate resources effectively. More specifically, recent theories emphasize the importance of informational asymmetries in credit markets and demonstrate how increases in the rate of inflation adversely affect credit market frictions with negative repercussions for financial sector (both banks and equity market) performance and therefore long-run real activity (Huybens and Smith 1998). The common feature of these theories is that there is an informational friction whose severity is endogenous.

Given this feature, an increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. Hence, there is negative relationship between increase in inflation rate and loan and advance.

In addition to the above theory, according to Reed and Gill (1989) there are seven factors that influence banks' loan policies, which in turn may have impact on the profitability of banks.

Capital position - The capital of banks serves as a cushion for protection of depositors' funds. The size of capital in relation to deposits influences the amount of risk that a bank can afford. Relatively large capital structure can make loans of longer maturities and greater credit risk.

Risk and profitability of varies types of loans – Some banks may emphasize earning more than others. Banks with greater need of earning might adopt more aggressive lending policies. An aggressive policy might call for consumer loans, which normally are made at higher rates of interest than short-term loans.

Stability of deposits- The fluctuation and type of deposit must be considered. After adequate provisions have been made for the primary and secondary reserves, bank can then engage in lending. Even though, these two reserves designed to take care of predictable deposit fluctuations and loan demands, unpredictable demand forces banks to give consideration to the stability of deposits in formulating loan policy.

Economic conditions- Stable economy is more conducive to a liberal loan policy than the one that is subject to seasonal and cyclical movements. Deposit in famine economies fluctuate more violently than deposit in an economy noted for its stability. Consideration must be given to the national economy. Factors adversely affect the nation as a whole may, if they are of serious magnitude, eventually affect local conditions.

Influence of monetary and fiscal policies - If monetary and fiscal policies are expansive and additional, reserves are made available to the commercial banking system; the lending ability of

banks is increased. Under these policies banks can have a more liberal loan policy than opposite situation exists.

Ability and experience of bank personnel – The expertise of lending personnel is not insignificant in the establishment of bank loan policy. One of the probable reasons that banks were slow in entering the consumer lending field was the lack of skilled personnel.

Credit needs of the area served - banks specialized experience on different types of loans e.g. Mortgage real-estate. The major reasons banks are chartered is to serve the credit needs of their communities. Banks are morally bound to extend credit to borrowers who present logical and economically sound loan requests.

Moreover, according to Black and Daniel (1989) there are also other factors that affect bank lending and investing activities. These factors include:

The interest rate or returns available from the various alternative lending and investing activities - Fundamental problem of bank management is achieving the proper balance between return and risk. The risk of loss associated with the various potential lending and investing activities and the willingness of bank management to take risks. Interest rate risk occurs because of the inverse relation between interest rate and the market price of marketable securities. The liquidity of fund tied up in varies lending and investing activities. To maintain adequate liquidity, bank must constantly guard against excessive losses from lending and investing activities. If bank made too many bad loans, the value of its asset could fall below the amount of its liabilities a situation known as insolvency.

Legal constraints regarding what are acceptable loans and investments

State and federal banking laws also influence bank loan and investment activities. Most of regulations are designated to ensure that banks do not take undue risks in the use of their depositors' funds.

Characteristics of the banks overall liability structure - in this case, the greater the proportion of a banks' deposits that is made up of demand deposits, the more volatile and uncertain will be the banks' need for cash to meet deposits withdrawals.

Types of lending

Commercial banks collect money from different sources and allocate the money in different ways such as reserve, securities and lending. Borrowers request banks for granting of loan for different purposes.

According to Read and Gill (1989) bank loans can be classified in a variety of ways, including:-

- **Purpose**- use of the borrowing funds such as real estate, agriculture, industry, and individual,
- **Type of Security**- secured loans involve the pledge of specific collateral such as plant and equipment, real estate and warehouses,
- **Maturity**- classified according to the maturity of the loan such as short, medium and long periods,
- **Method of repayment**- loans may be repaid in one go on lump sum basis or on installments, and
- **Origin** - loan portfolios of commercial banks are derived principally from sources such as directly from borrowers, purchase of notes from dealers of consumer goods, loans originated by other banks and purchasing notes from commercial paper dealers.

Banking industry classifies loans according to purpose or use of proceeds. Some authors who wrote in banking such as Mac Donald and Koch (2006), Campbell et al. (1988) and Black and Daniel (1981) grouped loans into the following categories based on the use of proceeds.

- **Real estate loans**: are loans secured by the real estate sector and generally consist either of property loans secured by first mortgages or interim construction loans.
- **Commercial loans**: consist of commercial and industrial loans, loans to financial institutions, and obligations (other than securities) to states and political sub-divisions. Commercial loans appear in many forms but typically finance firms' working capital needs, equipment purchases and plant expansions.
- **Individual loans**: include those negotiated directly with individuals for household, family and other personal expenditures, and those obtained indirectly through the purchase of retail paper.

- **Agricultural loans:** appear in many forms but typically finance agricultural production and include other loans to farmers.
- **Other loans in domestic offices:** include all other loans and all lease – financing receivables in domestic offices.
- **International loans:** are essentially business loans and lease receivables made to foreign enterprises or loans guaranteed by foreign governments.
- **State and political subdivisions:** loans given to state and political divisions for budget deficit and projects.
- **Foreign banks:** include individuals and business firms located abroad and borrowed just like in local borrowers.
- **Security loans:** many firms hold substantial amount of securities that can be pledged to secure business loans. The amount that bank will loan on securities also depends largely on credit risk and marketability.
- **Farmer’s loan:** Loan for current expenses include loans made by commercial banks for financing recurring seasonal expenses of crop and feeder livestock production, such as seed, fertilizer, labor and fuel. The purpose of farmer intermediate term loan is to purchase asset that will last several years such as livestock, machinery and property improvement.

2.3. Review of related empirical studies

2.3.1. Determinants of commercial bank’s lending behavior-empirical studies

As indicated in section above, determinants of bank lending behavior may be classified into internal and external factors. External factors include monetary policy, macro environment and interest rates. Internal factors, on the other hand, include volume of deposit, bank size and capital, liquidity, bank healthy and management style of the banks. Both internal and external determinants studied by different scholars are reviewed in the following paragraphs.

Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). Kashyap and

Stein's (2000) study in U.S.A noted that if contraction monetary policy reduces loan supply, it would reduce more at banks with less liquid balance sheet. The more liquid banks can protect their loan portfolios by drawing down their buffer stock of cash and securities. To illustrate this argument the study made in Turkey by Sengonol and Thorbecke (2005) showed that contraction policy did reduce the supply of bank loan in Turkey. Both Kashyap and Stein (2000) in the U.S.A and Sengonol and Thorbecke (2005) in Turkey used Kashyap - Stein (K-S) a two-step approach to test monetary policy effects on loan supply. Keeton (1993) found that monetary policy not only affect bank lending directly, by changing deposits, but also indirectly, by changing the return on securities and the cost of CDs.

Baran and Smiljanic (2008) using survey design studied the effects of monetary tightening and bank financing towards small and medium enterprise (SME) and large companies in Croatia. This study showed that monetary tightening had significantly influenced credit policies of commercial banks toward SME and large companies. As per the study, the influence on SME was more significant than on the large companies. One can understand from the above study that monetary policy which is inclined to contraction policy affects more banks which are less liquid. Reduce loan supply indirectly affect the return on securities and influence both small, medium and with less significance on large companies.

Webb (2000) in studying impacts of liquidity constraints on U.S banks indicated that in a financial system where firms are primarily financed by bank debt, banks are primarily financed by demand deposits. There can be a knock-on effect where by depositors' liquidity demand means that a bank faced with a shortage of funds that the bank cannot lend to their corporate borrowers. In this study, Webb (2000) indicated that bank liquidity problem temporarily solved by rationing or insurance guarantee on deposit. However, the study did not consider role of deposit insurance as a solution.

Cadet (2009) also examined the linkage between monetary policy and banking failure in developing countries using banking sector profit maximizing model. Cadet (2009) found that despite treasury bills was one of the alternative source of profit in developing countries, a tight monetary policy aggravated chances of banks failure. Increase interest rate directly increased asymmetric information. Therefore, an efficient bank should decrease its loan portfolio to overcome this information. Based on this, Cadet (2009) recommended to policy makers at the

central banks that they should be highly concerned with adverse effects of tightening monetary policy (banks failure). Monetary policy implemented to stabilize the price level may destabilize the banking sector if the increment of interest rate is not moderate (Cadet, 2009).

When monetary policy becomes restrictive, banks have to reduce or stop new lending because of decreasing reserve and hence deposits. Mostly, the source of loans is depositors' fund. When deposit decreased, it is not fully substitutable by other financing possibilities like issuing bond, equity sales and CDs due to credit market frictions on the depositors' side (Stein, 1998).

There are opposite views that explain contraction of monetary policy does not have impact on reserve and hence loan. The study made in the U.S.A by Oliner and Rudebusch (1996) using Kashyap, Stein and Wilcox (KSW) (1993) style of analysis revealed that monetary contractions did not constrict the supply of bank loan relative to the supply of non-bank credit. Finally, they concluded that direct link between a policy impacted reduction of bank reserves and bank lending had very weak relation over the years 1974-1991.

To over-come liquidity problem, banks use other sources such as securities, equity and CDs. Matz (2010) explained that the holding of highly marketable securities as means of buffer that can be used when liquidity problems occur until other standby sources of liquidity accessed. All the point raised in the above paragraphs is from the lender (banker) point of view. If one sees the issue from the borrowers' side, firms should prepare themselves when restrictive monetary policy implemented in the country.

Valverde and Del Peso (2009) analyzed the financing behavior of Spanish firms during 1992-2003 using KSW model. Valverde and Del Peso (2009) found that firms having high liquid asset might have an alternative means and could replace loan financing in case of tight monetary policy conditions. Further, according to the study, higher liquidity allowed firms to make investment in viable business or alternatives during such periods.

Quagliariello (2009) used the portfolio model proposed by Baum et al. (2005) and reported that macroeconomic in Italy was important determinant of banks lending decisions and also was the cause of high disturbance in allocation of financial resources. On the contrary to Quagliariello(2009), a study made in Germany using value at risk (VAR) model showed that the

response of loans to aggregate supply, demand and monetary policy shock was rather weak and in most cases insignificant (Eickmeier et al., 2009).

Capital requirement is also one of the external factors that affect lending. According to Furlong (1992) in the 1990s bank regulation in general and capital regulation in particular were widely perceived as having become stiffer. In New England bank loan growth rates were positively related to capital to asset ratios. Therefore, capital regulation had got big effect on bank lending (Furlong, 1992).

Cumming and Nel (2005) using trend analysis studied about lending behavior preliminary finding on expected impact of Basel II4 in South Africa. This study showed that the implementation of the 1988 Basel Accord raised the capital adequacy ratio means raising additional capital which address the new accord implementation that would decrease bank lending and bring economic contraction. Kishan and Opiela (2000) tested bank loan supply shifts by segregating bank according to asset size and capital coverage ratio in U.S using model of banks. Kishan and Opiela (2000) argued that bank asset size and bank capital affect the ability of banks to raise funds and maintain loan growth during contraction policy.

A study conducted in Austria on the effects of changes in monetary policy on bank lending using modeling showed that smallest average bank size reveals the strongest lending reaction when interest rate changes (Schnatter and Kaufmann, 2006). Another study by Kishan and Opiela (2000) carried out in the U.S.A on bank loan supply shifts revealed that small banks are most sensitive to monetary policy. Large time deposits of small banks are unresponsive to policy. This supported their hypothesis that small banks were not able to raise different options of funds to finance loans during contraction policy (Kishan and Opiela, 2000).

Bank health is measured by capital adequacy and non-performing loans (NPLs). Therefore, banks which have capital adequacy problem and high rate of NPLs decrease lending. Fukuda et al. (2006) investigated what impacts weakened financial condition of banks in Japan and showed that regulatory capital adequacy and ratio of non-performing loan had opposite impact on lending.

Banks credit culture and management also have impacts on lending. Henry (1985) revealed that a bank credit culture binds together all related matter to credit. The main credit cultures are policy,

process and audit. Henry (1985) also added other factors such as management tone, attention to fundamentals and loan officer involvement.

Olokoyo (2011) investigated the determinants of commercial banks' lending behavior in the Nigerian context. The study was aimed to test the determinants of commercial banks lending behavior and how it affects the lending behavior of commercial banks in Nigeria. The model used is estimated using Nigerian commercial banks loan advance (LOA) and other determinants or variables such as their volume of deposits (Vd), their investment portfolio (Ip), interest (lending) rate (Ir), stipulated cash reserve requirements ratio (Rr) and their liquidity ratio (Lr) for the period; 1980 – 2005. The model hypothesizes that there is functional relationship between the dependent variable and the specified independent variables. From the regression analysis, the model was found to be significant and its estimators turned out as expected and it was discovered that commercial banks deposits have the greatest impacts on their lending behavior.

Olumuyiw et al. (2012) *takes* a look at determinants of lending behavior of commercial banks in Nigeria: a Co-integration analysis between 1975 to 2010. The study used secondary data and series of econometrics techniques to justify the long run relationship between Commercial bank and its lending behavior over the period of analysis. Moreover, the study investigates the level of commercial banks loan advances in Nigeria and to also examine those various determinants of commercial banks lending behavior in Nigerian. More so, the model used is estimated using Nigerian commercial bank Loan and advances (LOA) and other determinants such as Volume of deposits (Vd), annual average exchange rate of the naira to dollar (Fx) for the period of thirty-seven (37) years, Investment Portfolio (Ip), Interest rate (lending rate) (Ir), Gross domestic product at current market price (Gdp) and Cash reserve requirement ratio (Rr). However, the model result reveals that there is positive relationship between Loan and advances and Volume of deposits, annual average exchange rate of the naira to dollar, Gross domestic product at current market price and cash reserve requirement ratio except Investment portfolio and Interest rate (lending rate) that have a negative relationship. It was also revealed from the result that there is a long run relationship between Loan and advances and all the explanatory variables in the model and this shows that commercial bank has a lot of impact of their lending behavior.

Jonas et al. (2013) investigated the determinants of bank lending behavior in Ghana. Using the GMM-System estimator developed by Arellano and Bover (1995) and Blundell and Bond

(1998), found that bank size and capital structures have a statistically significant and positive relationship with bank lending behavior. Also find evidence of negative and significant impact of some macroeconomic indicators (central bank lending rate and exchange rate) on bank lending behavior. Again, competition in the industry was found to have a positive and significant impact on bank lending behavior. Finally, relationship banking was found to have a positive correlation with bank lending behavior in Ghana. Thus, policies aimed at maintaining stable macroeconomic fundamentals would greatly accelerate bank lending decision.

(kashif and mohammed 2008) empirically identifies the factors which explain the bank credit to the businesses in varying financial environments and emerging global challenges. The growth in bank credit to the private sector is used as dependent variable whereas growth of liabilities from abroad, growth in domestic deposits, money market rate, M2 as percentage of GDP, real economic growth, inflation and the exchange rate are identified as major explanatory variable to explain the behavior of bank credit. With the major focus on the supply side this study uses the ARDL econometric approach using annual data from the period 1971 to 2008 for Pakistan. The empirical results indicate that the foreign liabilities, domestic deposits, economic growth, exchange rate, and the monetary conditions have significant impact on banks credit to the private sector in Pakistan, particularly in long run. Whereas the inflation and money market rate do not affect the private credit. Moreover, in short run the domestic deposit does not influence private credit. The reason may be that the banks do not issue immediate loan from currently deposited amount by account holders. The results also infer that the financial health and liquidity of the banks play a significant and vital role in the determination of loan.

A strong economic condition measured by GDP, as motivating factor to banks has statistically significant impact on issuance of more private credit to businesses. Results also indicates that the long run relationship is stable and any disequilibrium formed in the short run will be temporary and get corrected over a period of time with a high speed of 53.5 percent per year. This study does not statistically distinguish the behavior of bank credit during non-financial (1971-1989) and financial reforms periods (1990-2008) in Pakistan.

2.3.2 Related empirical studies in Ethiopia

Some related studies were conducted by different researchers in Ethiopia. Specifically, Zewude (2011) examined the impact level of credit risk management towards the profitability of commercial banks in Ethiopia in general. It argues that credit risk management has significant impact on profitability of banks of our country. To examine its impact level the researcher used multiple regression models by taking 10 years ROE (dependent variable), NPLR and CAR (independent variables) from each bank and in addition to that questioner was also distributed to the authorized bodies in the risk management position of each bank. The researcher took seven banks purposively that have ten year and above life span in Ethiopia.

Semu (2010) assessed the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. It also attempted to examine the possible factors that compel the banks to reduce or restrict lending. Quantitative method particularly survey design approach was adopted for the study. The survey was conducted with individuals working in both private and state owned banks in Ethiopia (assuming different positions) using self administered questionnaire. In addition, the study used structured review of documents and/or records held by banks. The findings of the study showed that deposit and capital have statistically significant relationship with banks' performance measured in terms of return on equity (ROE). New loan and liquidity have relationship with banks' performance measured in terms of both return on asset (ROA) and ROE. However, the relationship is found to be statistically insignificant. Deposit and capital have no statistically significant relationship with banks' performance in terms of ROA. The study suggests that when banks face lending constraints, they have to use their funds like by purchasing treasury bills and bonds. Moreover, banks must develop non-interest generating services. Excess cash maintained by banks should be used by diversifying credit options and to avoid inefficiencies.

2.4 Summary and Knowledge gap

In line with the above theoretical as well as empirical review, lending behavior is important to banking industry since lending is undoubtedly the heart of banking business. It also revealed that banks lending can be affected by different factors such as bank specific and macroeconomic

factors while this study was focused on some of the bank specific and macroeconomic factors affecting lending behavior of commercial banks of Ethiopia.

Most of the literature reviewed in this study focused on the developed countries' banking sector. Although such types of research were done in developing countries limited literatures were available for this research.

To the knowledge of the researcher there is no empirical studies done regarding to determinants commercial bank's lending behavior in Ethiopia and previous related studied focused only on performance rather than determinants.

Since the banking industry is in the growth stage with opening of new banks and the absence of active secondary stock exchange in the country, it is important to notify the important determinants of banks lending behavior by making empirical investigation to already established banks. Therefore, this study filled the gap by giving more emphasis on the bank specific and macroeconomic factors affecting banks lending behavior of commercial bank of Ethiopia.

CHAPTER THREE

3. Research design

The purpose of this chapter was to present the research questions and hypotheses and the research approach adopted by the study. The chapter was arranged as follows. Section 3.1 presented the research questions, variable description and hypotheses for the study. This was followed by the research approach adopted by the study under section 3.2. Next, the population and sampling design for the study explained in section 3.3. Then, data collection, analysis and presentation techniques were explained under section 3.4. Finally, the regression model for the study was discussed under section 3.5.

3.1. Research questions, variable description and hypotheses

As presented in the first chapter the broad objective of this study was on:

- 1) What are the determinants of lending behavior in commercial bank of Ethiopia?

In order to achieve this broad objective, one research questions addressing the broad objectives and seven research hypotheses were developed. The research hypotheses were developed to break down the research questions.

3.1.1. Research questions

Commercial banks decisions to lend out loans are influenced by a lot of factors such as the volume of deposits, level of domestic and foreign investment, interest rate, and cash reserve requirement and liquidity ratio to mention a few.

R1: what are the determinants of lending behavior in commercial bank of Ethiopia?

3.1.2. Variable description and research hypotheses

This research work was attempted to examine the relationship between the dependent and independent variables through testing the hypotheses regarding to the determinants between loan and advances and firm specific and macroeconomic factors affecting it in the case of commercial banks in Ethiopia. Therefore, the following hypotheses were developed to break down the above research questions.

H1: Volume of deposit has positive and significant impact on banks' loans and advances

H2: Interest rate has negative and significant impact on banks' loans and advances

H3: Bank size has positive and significant impact on banks' loans and advances

H4: Cash reserve requirement has negative and significant impact on banks' loans and advances

H5: Liquidity ratio has negative and significant impact on banks' loans and advances

H6: Gross Domestic Product has positive and significant impact on banks' loans and advances

H7: Inflation rate has negative and significant impact on banks' loans and advances

3.1.2.1. Dependent variable

Loan and advance

The term „loan“ refers to the amount borrowed by one person from another. The amount is in the nature of loan and refers to the sum paid to the borrower. Thus from the view point of borrower, it is „borrowing“ and from the view point of bank, it is „lending“. Loan may be regarded as „credit“ granted where the money is disbursed and its recovery is made on a later date. It is a debt for the borrower. While granting loans, credit is given for a definite purpose and for a predetermined period. Interest is charged on the loan at agreed rate and intervals of payment. „Advance“ on the other hand, is a „credit facility“ granted by the bank. Banks grant advances largely for short-term purposes, such as purchase of goods traded in and meeting other short-term trading liabilities. There is a sense of debt in loan, whereas an advance is a facility being availed of by the borrower. However, like loans, advances are also to be repaid. Thus a credit facility- repayable in installments over a period is termed as loan while a credit facility repayable within one year may be known as advances. To proxy loan and advance, Log of loan and advance was used.

3.1.3 Independent variables

3.1.3.1 Volume of deposits

The lending activity is made possible only if the banks can mobilize enough funds from their customers. Since commercial banks depend on depositor's money as a source of funds, it means that there are some relationships between the ability of the banks to mobilize deposits and the amount of credit granted to the customers (Tomola 2013).

As total deposit increase the total advance and loan increases proportionally (Ajay 2007). An increase in deposit of a bank will improve its ability to lend more funds to its customers.

As Jayaratne and Morgan (1997), lending and deposits move together because faster deposit growth signals growing demand for loans. To proxy volume of deposit, volume of deposit to total asset ratio was used.

H1: Volume of deposit has positive and significant impact on banks' loans and advances

3.1.3.2 Bank size

It measures general capacity to undertake intermediary function and is considered as an important determinant of bank lending decision (Berger and Udell, 2006). Berger and Udell (2006) provide that large and complex banks tend to lend few loans to small scale firms. Stein (2000) explains that small banks have comparative advantages in producing soft information whereas large banks also have comparative advantages in lending based on hard information. On the other hand, when large and complex banks are able, through technical expertise, to process soft information about small scale firms, then there would be positive relationship between bank size and lending. To proxy bank size natural logarithm of total assets of the bank was used.

H2: Bank size has positive and significant impact on banks' loans and advances

3.1.3.3 Interest rate

Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). Kashyap and Stein's (2000) study in U.S.A noted that if contraction monetary policy reduces loan supply, it

would reduce more at banks with less liquid balance sheet. The more liquid banks can protect their loan portfolios by drawing down their buffer stock of cash and securities. To illustrate this argument the study made in Turkey by Sengonol and Thorbecke (2005) showed that contraction policy did reduce the supply of bank loan in Turkey. Both Kashyap and Stein (2000) in the U.S.A and Senngnol and Thorbecke (2005) in Turkey used kashyap - Stein (K-S) a two-step approach to test monetary policy effects on loan supply. Keeton (1993) found that monetary policy not only affect bank lending directly, by changing deposits, but also indirectly, by changing the return on securities and the cost of CDs.

To proxy interest rate market interest rate or interest rate on annual average loans was used.

H2: Interest rate has negative and significant impact on banks' loans and advances

3.1.3.4 Cash reserve requirement

The liquidity of banks could be controlled by the minimum reserve requirements given by each respective countries central bank in order to protect the bank against liquidity rush from its depositors in certain economic conditions. Goldfeld and Chandler (1986) support this assumption by stating: "Commercial banks must pay more attention to liquidity than many other types of financial institution such as life insurance companies. This results from the high turnover of their debt liabilities. A large part of the gross out payments by a bank is met from current gross receipt of funds in the normal course of business."

The reserve requirement ratio also plays an important role in a banks capacity to give out loans and credit. The assumption here is that the higher the reserve requirements from the central bank, the lower the amount of credits and loans a bank is willing to give to the public. Annual reserve requirement rate was used as proxy.

H3: Cash reserve requirement has negative and significant impact on banks' loans and advances

3.1.3.5 Liquidity ratio

Comptrolle's Handbook (1998), states that lending is the principal business activity for most commercial banks. The loan portfolio is typically the largest asset and the predominate source of revenue. As such, it is one of the greatest sources of risk to a bank's safety and soundness. Since

loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. According to Pilbeam (2005, p. 42), in practice the amount of liquidity held by banks is heavily influenced by loan demand that is the base for loan growth. If demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Therefore, loans and advance has negative impact on banks liquidity. Liquid asset/total asset was used to proxy his variable.

H4: Liquidity ratio has negative and significant impact on banks'' loans and advances

3.1.3.6 Gross Domestic Product

A strong economic condition measured by GDP, as motivating factor to banks has statistically significant impact on issuance of more private credit to businesses. A strong economic condition creates more demand for goods and services which lead to more investment in different sectors hence increase the per capita income as well as the savings, collectively these factors convince to banks to issue more private credit (kashif and mohammed 2008).

In a recent study Guo and Stepanyan (2011) indicated that domestic and foreign funding is positively associated with the credit growth. The stronger economic growth leads to higher credit growth. Growth rate of real gross domestic product was used to proxy this variable.

H5: Gross Domestic Product has positive and significant impact on banks'' loans and advances

3.1.3.7. Inflation rate: According to the recent theory of information asymmetry in the credit market an increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. To proxy inflation the annual gross inflation rate was used.

H6: Inflation rate has negative and significant impact on bank's loan and advance

3.2 Research Approach adopted

Quantitative methods approach was used to meet the overall objective of the study and to answer research questions and to test hypotheses under it. According to Loose (1993), a quantitative (deductive) research entails the development of a conceptual and theoretical structure prior to its testing through empirical observation. Deductive or quantitative research conventionally commences by analyzing the literature to identify a single selected problem/knowledge gap leading to the isolation of the major research question(s) in which the existing knowledge may be inadequate (could be identified gaps between existing theories or evidence, contradictions to be explored, or new contexts for applying previous findings) (Sutrisna 2009). Therefore, the purpose of using quantitative approach in this study was to apply previous findings in the context of Ethiopia. As per Creswell (2009), there are two major strategies of enquiry in quantitative approach such as survey and experimental. Among the quantitative approach strategies of enquiry this study used survey. Fowler (1984, p. 12 cited in Yesegat 2009) noted that the strengths of survey methods that result in their wider use included the value of statistical sampling, consistent measurement, and the ability to obtain information not systematically available elsewhere or in the form needed for analysis.

The purpose of quantitative studies for the researcher is to project his or her findings onto the larger population through an objective process. Data collected, often through surveys administered to a sample or subset of the entire population, allow the researcher to generalize or make inferences. Results are interpreted to determine the probability that the conclusions found among the sample can be replicated within the larger population. Conclusions are derived from data collected and measures of statistical analysis (Creswell 2002; Thorne and Giesen 2002). The goal is to measure and analyze causal relationships between variables within a value-free framework (Denzin and Lincoln 1994). In this study, this approach was enabled to examine the relationship between the loan and advance and the major firm specific and macroeconomic factors affecting commercial banks lending behavior in Ethiopia by establishing causal relationship. In turn, this enabled to test the theory in the context of Ethiopia.

3.3. Population and sampling procedure

Population of the study: study population/participants included commercial bank's head offices found in Addis Ababa in the fiscal year 2012/13. According to NBE (2012/13), there are nineteen commercial banks in the year 2012/13 such as Commercial Bank of Ethiopia (CBE), Development Bank of Ethiopia (DBE), construction and Business Bank (CBB), Dashen Bank S.C (DB), Awash International Bank S.C (AIB), Wogagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB), Bank of Abyssinia S.C (BOA), Lion International Bank S.C (LIB), Cooperative Bank of Oromia S.C (CBO), Berehan International Bank S.C (BIB), Buna International Bank S.C (BUIB), Oromia International Bank S.C (OIB), Zemen Bank S.C (ZB), Abay Bank S.C.(AB), Addis International Bank (AIB), and Enat Bank (EB).

Sampling frame: The frame for drawing sample included those commercial banks having at least thirteen years working experience in Ethiopia (i.e. from 2001 to 2013). In Ethiopia there are nine commercial banks having at least thirteen years experience which include: Commercial Bank of Ethiopia (CBE), Development Bank of Ethiopia (DBE), Construction and Business Bank (CBB), Dashen Bank S.C (DB), Awash International Bank S.C (AIB), Wogagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB) and Bank of Abyssinia S.C (BOA). Therefore, the matrix for the frame is 13*8 that includes 104 observations.

Sample: It is the portion of the study population and used when addressing the total population in the study is not possible. But in this case, since the number of banks in the country is small, the study assumed the data of all banks without taking sample. Or there will be no need of taking sample from the frame. Therefore, the sampling frame and the sample was the same. According to Brooks (2008, p 105), while there is no definitive answer for an appropriate sample size for model specification, it should be noted that most testing procedures in econometrics rely on asymptotic theory. This theory says that as the sample size approaches to the population, the results from the sample estimates are more appropriate for generalizing to the general population. Thus in this case the sample size was almost equal to the population which enabled to make appropriate generalization to the overall population.

3.4. Data collection, presentation and analysis techniques

3.4.1. Data and data collection instruments

Only secondary data was used for the study. Conducting appropriate data gathering instruments will help researchers to combine the strengths and amend some of the inadequacies of any source of data to minimize risk of irrelevant conclusion. Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increase the credibility and value of research findings (Koul 2006). Accordingly, structured document analysis was used for this research to collect required information, which was relevant for addressing the objectives of the study. Data was collected from audited financial statements (balance sheet and income statement) of each commercial bank included in the sample and various journals and publications of NBE and MoFED for the macroeconomic data from 2003 to 2013. All data was collected on annual base and the figures for the variables were on June 30 of each year under study.

3.4.2. Data presentation and analysis

To test the proposed hypotheses, statistical analyses was carried out using the following methods: First, descriptive statistics of the variables (both dependent and independent) was calculated over the sample period. This is in line with Malhotra (2007), which states using descriptive statistics methods helps the researcher in picturing the existing situation and allows relevant information. Then, correlation analyses between dependent and independent variables were made. Finally, balanced fixed effect regression approach including all of its assumptions was employed. Data was collected from different sources and analyzed by using Eviews 6 software package.

3.5. Regression model specification

3.5.1 Formulation of Empirical Model

It could be conjectured from the works reviewed in the previous section that the lending of commercial bank is determined by some factors both at the micro and macro levels. Thus in respect of the hypotheses stated above, the main issue is an investigation of the relationship that exists between the loan and advances of commercial banks and each of the other explanatory variables that had been identified through literature and theory i.e. volume of deposits, bank size,

interest rate, cash reserve requirement, liquidity ratio, inflation rate and gross domestic product etc. Other factors not explicitly included in the model were policy instruments for regulation of banks operation like government control and monetary authorities' guidelines and past relationship with customers and etc. These were captured by the error term in the model. The model adopted for the paper was assumed an underlying relationship between the variables expressed in a hypothesis and banks' loans and advances.

The nature of data that was used in this study enabled to use panel/longitudinal data model which is deemed to have advantages over cross sectional and time series data methodology. Panel data involves the pooling of observations on the cross-sectional over several time periods. As Brook (2008) stated the advantages of using panel data set; first and perhaps most importantly, it can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone.

Second, it is often of interest to examine how variables, or the relationships between them, change dynamically (over time). To do this using pure time-series data would often require a long run of data simply to get a sufficient number of observations to be able to conduct any meaningful hypothesis tests. But by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test, by employing information on the dynamic behavior of a large number of entities at the same time. The additional variation introduced by combining the data in this way can also help to mitigate problems of multicollinearity that may arise if time series are modeled individually. Third, by structuring the model in an appropriate way, we can remove the impact of certain forms of omitted variables bias in regression results. Thus, the general panel/longitudinal regression model was as follows:

$$y_{it} = \alpha + \beta x_{it} + u_{it}$$

With subscript i denote the cross-section and t representing the time-series dimension. The left-hand variable y_{it} is the dependent variable, α is the intercept term, β is a $k \times 1$ vector of parameters to be estimated on the explanatory variables, and x_{it} is a $1 \times k$ vector of observations on the explanatory variables, $t = 1, \dots, T$; $i = 1, \dots, N$. Therefore the general models which incorporate all of the variables to test the hypotheses of the study were:

The model is specified implicitly below:

$$\text{LOA} = f(\text{Vd}, \text{Bs}, \text{Ir}, \text{Rr}, \text{Lr}, \text{Gdp}, \text{Infr}, \text{Z}) \dots \dots \dots (1)$$

Where Z contains other variables not explicitly included in the model.

The explicit form of equation (1) above was represented as follows:

$$\text{LOA} = \alpha_0 + \alpha_1 \text{Vd} + \alpha_2 \text{Bs} + \alpha_3 \text{Ir} + \alpha_4 \text{Rr} + \alpha_5 \text{Lr} + \alpha_6 \text{Gdp} + \alpha_7 \text{Infr} + \mu \dots \dots \dots (2) \text{ (Olokoyo, 2011)}$$

Where:

LOA: Loans and Advances

Vd: Volume of Deposits

Bs : Bank size

Ir: Interest Rate (Lending Rate)

Rr: Cash Reserve Requirement Ratio

Lr: Liquidity Ratio

Gdp: Gross Domestic Product at current market price

Infr : Inflation rate

μ : error term controlling for unit-specific residual in the model

α_0 : intercept of the regression line

α_i (i=1-5) : coefficients to be estimated and their a priori expectations are as follows: α_1, α_2 , and $\alpha_6 > 0$ while $\alpha_3, \alpha_4, \alpha_5$, and $\alpha_7 < 0$

The model specified above, was used to empirically achieve the objective of the study.

Proxy and definition of variables

Table 3.1 Summary of explanatory variables and their expected effect on the dependent variables

Dependent variable	Variables Proxies and Definition	Expected effect
Loan and advance	Log of loan and advance	NA
Independent variable		
Volume of Deposits	Total deposit (demand, saving and time deposit) / Total Asset	Positive
Bank size	Log of total assets	Positive
Interest Rate (Lending Rate)	Market interest rate or interest rate on annual average loans	Negative
Cash Reserve Requirement Ratio	Annual reserve requirement ratio	Negative
Liquidity Ratio	Liquid asset/total asset	Negative
Gross Domestic Product	GDP: growth rate of real gross domestic product	Positive
Inflation rate	Annual gross inflation rate	Negative

CHAPTER FOUR

4. Results and Discussion

In the preceding chapters important literatures relating to the topic were reviewed that gives enough understanding about the topic and used to identify knowledge gap on the area. To meet the broad research objective and to answer research questions and to test research hypotheses under it the research design used for this study also discussed in the preceding chapter. In this chapter the data collected was presented and an important correlation and regression analysis finding was discussed.

The current chapter has five sections. Under the first section (section 4.1.) the descriptive statistics of the dependent and independent variables was presented followed by correlation analysis under section 4.2. Section 4.3 presents the test for the classical liner regression model/CLRM. Then, the results of the regression analysis were presented under section 4.4. Finally, discussions for the results of the regression analysis were made under section 4.5.

4.1. Descriptive statistics of the data

The descriptive statistics for the dependent and independent variables are presented bellow. The dependent variables are loan and advance measured by Log of loan and advance. The remaining are the independent variables such as: volume of deposit, liquidity ratio, bank size, interest rate, cash reserve requirement, gross domestic product and inflation rate. Table 4.1 bellow Present the descriptive statistics of the dependent and independent variables.

Table 4.1 descriptive statistics of dependent and independent variables

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
LOA	9.298	9.274	10.795	8.127	0.488	104
VD	0.749	0.769	0.872	0.520	0.075	104
LR	0.369	0.363	0.594	0.148	0.102	104
SIZE	22.076	21.957	25.791	19.181	1.316	104

IR	0.114	0.115	0.128	0.105	0.008	104
RR	0.081	0.050	0.150	0.050	0.042	104
GDP	0.092	0.112	0.127	-0.021	0.043	104
INF	0.131	0.109	0.364	-0.106	0.128	104

Source: Financial statement of sampled commercial banks and own computation through

EvIEWS 6

Loan and advance was highly dispersed from its mean value (i.e. 9.298) with the standard deviation of 0.488. The maximum and minimum values were 10.795 and 8.127 respectively. The maximum value indicating the commercial bank of Ethiopia (CBE) and the minimum value was some of privately owned commercial banks in Ethiopia such as NIB and UB.

Among the bank specific independent variables Size of banks was highly dispersed from its mean value (i.e. 22.076) with the standard deviation of 1.316. The maximum and minimum values were 25.791 and 19.181 respectively. The maximum value indicating the commercial bank of Ethiopia (CBE) and the minimum value was some of privately owned commercial banks in Ethiopia such as NIB and UB. In terms of size CBE outweighs some banks more than 100%.

The mean value of volume of deposit was 74.9 % which shows that lion share of the asset is financed by deposit from customers with the maximum and minimum values of 87.2 % and 52 % respectively. The standard deviation for volume of deposit was 7.49 % revealing high dispersion towards the mean among banks in Ethiopia.

The mean value of liquidity ratio was 36.9 % that was above the NBE requirement before January, 2012 (i.e. 25% (Addis Fortune January 2012)). The standard deviations of 10.2% show little dispersion of liquid assets to total assets ratio from its mean for the commercial banks in Ethiopia. The maximum and minimum values of L1 were 59.4 % and 14.8 % respectively.

The remaining independent variables were the macroeconomic indicators that can affect banks lending behavior over time. The mean value of real GDP growth rate was 9.2 % indicating the average real growth rate of the country's economy over the past 13 years. The maximum growth

of the economy was recorded in the year 2005 (i.e. 12.6%) and the minimum was in the year 2003 (i.e. -2.1%). Since the year 2004 the country has been recording double digit growth rate with little dispersion towards the average over the period under study with the standard deviation of 4.3%. The general inflation rate (i.e. 13.1%) of the country on average over the past thirteen years was more than the average GDP. The maximum inflation was recorded in the year 2009 (i.e. 36.4%) and the minimum was in the year 2002 (i.e. -10.6%). The rate of inflation was highly dispersed over the periods under study towards its mean with standard deviation of 12.8%.

The other macroeconomic factors were related with interest rate that is lending interest rate. The mean value of the lending interest rate over the period under study was 11.4 % with the maximum and minimum values of 12.8 % (in the years 2009 and 2010) and 10.5 % (in the year 2000) respectively. There was little variation of interest rate margin towards its mean value over the periods under study with the value of standard deviation 0.8 %.

4.2. Correlation analysis

Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The most widely used bi-variant correlation statistics is the Pearson product-movement coefficient, commonly called the Pearson correlation which was used in this study. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship). The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. As a sample size approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Meyers et al. 2006). The sample size of the study was 8*13 matrixes of 104 observations which was even more than 100 hence the study used the above justification for significance of the correlation coefficient. Table 4.2 bellow shows the correlation coefficient between the dependent variables and independent variables.

Table 4.2 Correlation among the dependent and independent variables matrix

	LOA	VD	LR	SIZE	IR	RR	GDP	INF
LOA	1.0000	0.3119	0.0691	0.9856	0.2046	0.4088	0.3403	0.4554

Source: Financial statement of sampled commercial banks and own computation through Eviews 6

According to Brooks (2008), if it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. Thus, it is not implied that changes in x cause changes in y , or indeed that changes in y cause changes in x rather, it is simply stated that there is evidence for a linear relationship between the two variables, and that movements in the two are on average related to an extent given by the correlation coefficient.

Volume of deposit was positively correlated with loan and advance with the coefficient of correlation 0.3119 and the linear relationship between VD and LOA was statistically different from zero/statistically significant. This was in line with the expectation. Loan and advance was positively correlated with bank size with the coefficient of correlation 0.9856 and statistically different from zero/statistically significant. During the last 13 years the size of all banks (log of total asset) which was included in this study shows improvement. Increase in the size of the bank shows a higher positive correlation with loan to total asset ratio (0.9856) and volume of deposit to total asset ratio (0.3119). The correlation result of 0.9856 and 0.3119 implies the contribution of volume of deposit and bank size on banks investment was increased. Liquidity ratio was positively correlated with loan and advance with the coefficient of correlation (0.0691) and this was opposite to the expectation and was statistically not different from zero/statistically insignificant.

Among the macroeconomic factors affecting loan and advance, interest rate, cash reserve requirement, and inflation rate was positively correlated with loan and advance of commercial banks in Ethiopia. This result was opposite to the expectation of the study and statistically different from zero/statistically significant. The positive relationship of GDP with loan and advance was in line with the study hypothesis and statistically different from zero/statistically significant.

4.3. Testing assumptions of classical linear regression model (CLRM)

➤ Test for average value of the error term is zero ($E(u_t) = 0$) assumption

The first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since the constant term (i.e. α) was included in the regression equation, the average value of the error term in this study is expected to be zero (Brooks 2008).

➤ **Test for homoscedasticity assumption ($\text{Var}(u_t) = \sigma^2$)**

It has been assumed thus far that the variance of the errors is constant. This is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. To test this assumption the white's test was used having the null hypothesis of heteroskedasticity. Both F-statistic and chi-square (χ^2) tests statistic were used.

Both the F - and χ^2 -test statistic give the same conclusion that there is evidence for the absence of heteroscedasticity. Since the p -values in all of the cases were above 0.05, the null hypothesis of heteroscedasticity should be rejected (appendix 2). The null hypothesis of heteroscedasticity should be rejected at 10% level for the F-statistics and χ^2 test statistic. The third version of the test statistic, "Scaled explained SS", which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, also give the same conclusion. Generally, in all of the regression models used in this study it was proved that the variance of the error term is constant or homoscedastic and we had sufficient evidence to reject the null hypothesis of heteroscedasticity.

➤ **Test for absence of autocorrelation assumption ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$)**

The test for autocorrelation was made by using both Durbin--Watson (DW) and Breusch-Godfrey Serial Correlation LM Test. Durbin--Watson (DW) is a test for first order autocorrelation -- i.e. it tests only for a relationship between an error and its immediately previous value where as Breusch-Godfrey Serial Correlation LM Test is more general than the DW test, and can be applied in a wider variety of circumstances since it does not impose the DW restrictions on the format of the first stage regression. The null hypothesis for the DW test is no autocorrelation between the error term and its lag. The Durbin-Watson Statistics ($D-W$ stat.) from the regression result before analysis shows that 1.88 which is approaching to 2 and hence no evidence for the presence of autocorrelation. In addition, Breusch-Godfrey Serial Correlation LM proved that both the F - and χ^2 -test statistic give the same conclusion that there is evidence for the absence of autocorrelation since the p -values in all of the cases were above 0.05.

➤ **Test for Normality assumption ($u_t \sim N(0, \sigma^2)$)**

A normal distribution is not skewed and is defined to have a coefficient of kurtosis 3. Bera-Jarque formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution are. The Bera-Jarque probability statistics/P-value is also expected not to be significant even at 10% significant level (Brooks 2008). According to Gujarati (2004), the JB is a large sample test and our sample of 104 was equal to the frame was large; we considered the JB test also. As shown in the histogram in the appendix (1) kurtosis closes to 3 (i.e. 2.644850), and the Jarque-Bera statistics was not significant even at 10% level of significance as per the P-values shown in the histogram in the appendix (i.e. 0.230572). Hence, the null hypothesis that is the error term is normally distributed should not be rejected and it seems that the error term in all of the cases follows the normal distribution.

➤ **Test for absence of series multicollinearity assumption**

This assumption is concerned with the relationship exist between explanatory variables. If an independent variable is an exact linear combination of the other independent variables, then we say the model suffers from perfect collinearity, and it cannot be estimated by OLS (Brooks 2008). Multicollinearity condition exists where there is high, but not perfect, correlation between two or more explanatory variables (Cameron and Trivedi 2009; Wooldridge 2006). According to Churchill and Iacobucci (2005), when there is multicollinearity, the amount of information about the effect of explanatory variables on dependent variables decreases. As a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are. This assumption does allow the independent variables to be correlated; they just cannot be perfectly correlated. If we did not allow for any correlation among the independent variables, then multiple regressions would not be very useful for econometric analysis.

How much correlation causes multicollinearity however, is not clearly defined. While Hair et al (2006) argue that correlation coefficient below 0.9 may not cause serious multicollinearity problem. Malhotra (2007) stated that multicollinearity problem exists when the correlation coefficient among variables is greater than 0.75. Kennedy (2008) suggests that any correlation

coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results. This indicates that there is no consistent argument on the level of correlation that causes multicollinearity. According to Gujarati (2004), the standard statistical method for testing data for multicollinearity is analyzing the explanatory variables correlation coefficients (CC); condition index (CI) and variance inflation factor (VIF). Therefore, in this study correlation matrix for seven of the independent variables shown below in the table were estimated. The results in the following correlation matrix show that the highest correlation of 0.4474 which is between size and inflation. Since there is no correlation above 0.7, 0.75 and 0.9 according to Kennedy (2008), Malhotra (2007) and Hair et al (2006) respectively, we can conclude in this study that there is no problem of multicollinearity.

Table 4.3. Correlation matrix of explanatory variables

	VD	LR	SIZE	IR	RR	GDP	INF
VD	1.0000	0.1650	0.2877	-0.0957	0.0176	0.0647	0.0103
LR	0.1650	1.0000	0.1520	0.0036	0.2151	0.0141	0.0983
SIZE	0.2877	0.1520	1.0000	0.2348	0.4040	0.3348	0.4474
IR	-0.0957	0.0036	0.2348	1.0000	0.3186	0.1640	0.2659
RR	0.0176	0.2151	0.4040	0.3186	1.0000	0.2880	0.2724
GDP	0.0647	0.0141	0.3348	0.1640	0.2880	1.0000	0.3142
INF	0.0103	0.0983	0.4474	0.2659	0.2724	0.3142	1.0000

Source: Financial statement of sampled commercial banks and own computation through

Eviews 6

Choosing Random effect (RE) versus fixed effect (FE) models

According to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. Hence the choice here is based on computational convenience. On this score, FEM may be preferable. Since the number of time series (i.e. 13 year) is greater than the number of cross-sectional units (i.e. 8 commercial banks), FEM is preferable in this case. According to Brooks (2008); Verbeek (2004) and Wooldridge (2004), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Hence, the sample for this study was not selected randomly and equals to the sample frame FEM is appropriate.

4.4. Results of the regression analysis

Under the following regression outputs the beta coefficient may be negative or positive; beta indicates that each variable's level of influence on the dependent variable. P-value indicates at what percentage or precession level of each variable is significant. R2 values indicate the explanatory power of the model and in this study adjusted R2 value which takes into account the loss of degrees of freedom associated with adding extra variables were inferred to see the explanatory powers of the models.

➤ Determinants of loan and advance - results

Operational model: the operational panel regression model used to find the statistically significant determinants of commercial banks lending behavior measured by Log of Loa was:

$$\text{LOA } i, t = \alpha + \beta_1 (\text{VDi}, t) + \beta_2 (\text{LRI}, t) + \beta_3 (\text{SIZEi}, t) + \beta_4 (\text{IRt}) + \beta_5 (\text{RRt}) + \beta_6 (\text{GDPT}) + \beta_7 (\text{INFt}) + u_{i,t}$$

Table 4.4 Regression results for determinants of Lending behavior measured by Log of loan and advance

Dependent Variable: LOA

Method: Panel Least Squares

Date: 05/1/14 Time: 11:57

Sample: 2001 2013

Periods included: 13

Cross-sections included: 8

Total panel (balanced) observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.018282	0.298046	6.771707	0.0000
VD	0.328072	0.151530	2.165068	0.0331**
LR	-0.431495	0.068520	-6.297389	0.0000*
SIZE	0.332640	0.014322	23.22544	0.0000*
IR	-2.125871	0.880210	-2.415187	0.0178**
RR	0.681576	0.207709	3.281404	0.0015*
GDP	0.115783	0.172904	0.669633	0.5048
INF	0.199906	0.072045	2.774734	0.0067*

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.821833	Mean dependent var	9.298294
Adjusted R-squared	0.793807	S.D. dependent var	0.487680
S.E. of regression	0.057988	Akaike info criterion	-2.494649
Sum squared resid	0.299271	Schwarz criterion	-2.113246
Log likelihood	156.6718	Hannan-Quinn criter.	-2.340132
F-statistic	29.32366	Durbin-Watson stat	1.880016
Prob(F-statistic)	0.000000		

Notes: R² = 0.821833; Adj R² = 0.793807; F-statistics = 29.32366 and prob (F-statistics = 0.000000), and Durbin-Watson stat = 1.882346

The starred coefficient estimates are significant at the 1 % (*) and 5 % (**) level.

Source: Financial statement of sampled commercial banks and own computation through Eviews 6

The above table presented results of loan and advance (LOA) as dependent variable and bank specific and macroeconomic explanatory variables for the sample of eight commercial banks in Ethiopia. The explanatory power of this model is high (i.e. around 79.38 %). The regression *F*-statistic takes a value 29.32366. *F*-statistics tests the null hypothesis that all of the slope parameters (β 's) are jointly zero. In the above case *p*-value of zero attached to the test statistic shows that this null hypothesis should be rejected even at 1% level of significance.

As it is shown in the above table volume of deposit, liquidity ratio, bank size, interest rate, cash reserve requirement and general inflation rate were the statistically significant factors affecting lending behavior of commercial banks in Ethiopia. Volume of deposit, bank size, cash reserve requirement, and inflation rate had positive and statistically significant impact on loan and advance at 5%, 1%, 1% and 1% level respectively. Liquidity ratio and interest rate had negative and statistically significant influence on banks' loan and advance in Ethiopia at 1% and 5% level respectively. Moreover, real GDP growth rate had statistically insignificant impact on loan and advance. The coefficient signs of cash reserve requirement and inflation rate were opposite to our expectation.

4.5. Discussion of the regression results

4.5.1. Determinants of lending behavior - discussion

➤ Volume of deposit and loan and advance

The first bank specific variable of the study was volume of deposit. Theories argue that volume of deposit and loan and advance have positive relationship. As total deposit increase the total advance and loan increases proportionally (Ajay 2007). As Jayaratne and Morgan (1997), lending and deposits move together because faster deposit growth signals growing demand for

loans. Consistent with these evidences, this study also confirmed a positive relationship between volume of deposit and loan and advance. This is also in line with the findings of (Olokoyo, F 2011, Olumuyiwa 2012 and Ajay 2007). The coefficient value of the variable (i.e. 0.3281) indicated a percentage rise/decline in volume of deposit to total asset ratio of banks resulted in (i.e. 0.3281%) rise/decline in loan and advance position of commercial banks in Ethiopia. Moreover, the sign of Volume of deposit conform to our prior expectation and this showed that as the Commercial bank Loan and advance increases in the economy, a lot of customers will definitely increase their deposit in the bank because they can be considered for loan and advances whenever they apply for it.

Furthermore, Volume of deposit has high coefficient value of 0.3281. The implication of this is that this explanatory variable has high impact and influence on the lending behavior of commercial banks and a change in it will yield the highest change in banks' loans and advances. Therefore banks should strive hard to manage their deposits efficiently so that their objective of profitability can be achieved and the multiplier effects maintained to the maximum. This implies that generation of more deposits is tangent to the survival of Ethiopian banks as a whole. Generally, we fail to reject the first research hypothesis (i.e. there is positive and significant relationship between volume of deposit and bank loan and advance).

➤ **Liquidity ratio and loan and advance**

The coefficient signs of liquidity ratio proved negative impact of liquidity ratio on banks' loan and advance. The negative impact of liquidity ratio on banks' loan and advance was in line with the hypothesis (2) which is based on the argument of taking loans as illiquid assets of banks. According to this argument when the amount of loans provided by banks increase, the amount of illiquid assets in the total assets portfolio of banks increase and lead to the reduction in the level of liquid assets held by banks. Also, according to Pilbeam (2005, p. 42), if demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Consistent with these evidences, this study also confirmed a negative relationship between liquidity ratio and loan and advance. This is in line with the findings of (Olokoyo, F 2011 and Olumuyiwa 2012). The coefficient value of the variable (i.e. -0.4315) indicated a percentage rise/decline in liquidity ratio of banks resulted in (i.e. -0.43%) rise/decline in loan and

advance position of commercial banks in Ethiopia. Generally, we fail to reject the second research hypothesis (i.e. there is negative and significant relationship between liquidity ratio and bank loan and advance).

➤ **Bank size and loan and advance**

The positive and statistically significant impact of bank Size on loan and advance was consistent with hypothesis (3) and in line with the assumption that according to the “too big to fail” argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta et al. 2007). Therefore, “too big to fail” status of large banks could lead to moral hazard behavior and excessive risk exposure. If big banks are seeing themselves as “too big to fail”, their motivation to hold liquid assets is limited and illiquid asset which is loan increases. Therefore, the bank size has a positive and statistically significant influence on bank lending. Bigger banks thus lend more than smaller ones. This is consistent with existing studies such as (Alfaro *et al.* 2003 and Jonas L, 2013) that bank size indeed contributes significantly to loan supply. Consistent with this evidence, this research found that there is positive and significant relationship between bank size and loan and advance. The coefficient value of the variable (i.e. 0.3326) indicated a percentage rise/decline in bank size of banks resulted in (i.e. 0.3326%) rise/decline in loan and advance position of commercial banks in Ethiopia.

➤ **Lending interest rate and loan and advance**

Theories argue that interest rate and loan and advance have negative relationship. Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). If central bank reduces the rate, banks become reluctant to provide loan to firms and vice versa McKinnon (2009).

Consistent with this evidence, this study also proved that there is a negative relationship between interest rate and loan and advance. As expected, anytime the central bank tightens monetary policy, bank lending is narrowed or reduced. This is in line with the findings of (Olokoyo, F 2011 and Olumuyiwa 2012). The coefficient value of the variable (i.e. -2.1258) indicated a percentage rise/decline in interest rate of banks resulted in more than 2% rise/decline in the loan

and advance of banks. Generally, we fail to reject the fourth research hypothesis (i.e. there is negative and significant relationship between interest rate and bank loan and advance).

➤ **Cash reserve requirement and loan and advance**

Theories argues that there is negative and statistically significant impact of cash reserve requirement on loan and advance and it is in line with the assumption that the reserve requirement ratio also plays an important role in a banks capacity to give out loans and credit. The higher the reserve requirements from the central bank, the lower the amount of credits and loans a bank is willing to give to the public. Hence, there can be negative relationship between lending interest rate and loan and advance. However, it was known from the result that there is a direct or positive relationship between Commercial bank Loan and advances and the cash reserve requirement ratio. This was also similar with the findings of (Olokoyo, F 2011 and Olumuyiwa 2012). The implication of this is that as commercial bank Loan and advances increases, cash reserve requirement ratio also increases overtime. Bank should therefore always ensure compliance with these policies. The coefficient value of the variable (i.e. 0.681) indicate a percentage rise/decline in lending interest rate of banks result in (i.e. 0.681%) rise/decline in loan and advance position of commercial banks in Ethiopia.

➤ **Real GDP growth rate and loan and advance**

The coefficient signs of real GDP growth rate show positive impact of real GDP growth rate on banks" loan and advance. The positive impact of real GDP growth rate on banks" loan and advance was in line with the hypothesis (6) which is based on the argument that a strong economic condition measured by GDP, as motivating factor to banks has statistically significant impact on issuance of more private credit to businesses. A strong economic condition creates more demand for goods and services which lead to more investment in different sectors hence increase the per capita income as well as the savings, collectively these factors convince to banks to issue more private credit (kashif and mohammed 2008). However, unexpectedly the results indicate that real gross domestic product has a positive coefficient but is not significant and were opposite to the expectation. This may suggest that bank lenders" expectations do not depend on the current phase of business activities, which confirms findings of Danilowska (2008).

The coefficient value of the variable (i.e. 0.3893) indicated a percentage rise/decline in real GDP growth rate resulted in (i.e. 0.03%) rise/decline in loan and advance position of commercial banks in Ethiopia. So, we reject the sixth research hypothesis (i.e. there is positive and significant relationship between GDP and bank loan and advance).

➤ **Inflation rate and loan and advance**

Theories argue that inflation rate and loan and advance have negative relationship. Since market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. Hence, there is negative relationship between increase in inflation rate and loan and advance.

However, this research found that there is positive and significant relationship between inflation rate and loan and advance. The coefficient sign was opposite to our expectation. Therefore, this finding disclosed that inflation rate has positive relationship with loan and advance. The implication of this is that commercial banks keep on giving additional loan and advance without being affected by inflation growth rate in the county. The coefficient value of the variable (i.e. 0.1999) indicated a percentage rise/decline in inflation rate of banks resulted in (i.e. 0.1999%) rise/decline in loan and advance position of commercial banks in Ethiopia. Generally, we reject the last research hypothesis (i.e. there is negative and significant relationship between interest rate and bank loan and advance).

Table 4.5 Summary of actual and expected signs of explanatory variables on the dependent variables

Explanatory variables	Expected impact on loan and advance	Actual impacts
Volume of deposit	Positive & Sig	Positive & Sig
Liquidity ratio	Negative & Sig	Negative & Sig
Bank size	Positive & Sig	Positive & Sig
Interest rate	Negative & Sig	Negative & Sig
Cash reserve requirement	Negative & Sig	Positive & Sig
Gross Domestic Product	Positive & Sig	Positive & ins
Inflation Rate	Negative & Sig	Positive & Sig

Note: Sig- statistically significant

Ins- statistically insignificant

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

Loan and advance constitutes the largest single income-earning asset in the portfolio of most banks as it is stated in the literature part. The aim of this paper was to investigate and verify the effectiveness of the common determinants of commercial banks lending behavior and how it affects the lending behavior of commercial banks in Ethiopia. Seven variables affecting bank's lending behavior were chosen and analyzed.

The panel data was used for the sample of eight commercial banks in Ethiopia from 2001 to 2013. Data was presented by using descriptive statistics. The balanced correlation and regression analysis for loan and advance was conducted. Before performing OLS regression the models were tested for the classical linear regression model assumptions. The models fulfill assumptions of the CLRM. Fixed effect model/FEM was used based on convenience. Seven factors affecting banks loan and advance were chosen and analyzed. From the list of possible explanatory variables, most of them proved to be statistically significant with the only exception of real GDP growth rate. The results of models enable us to make following conclusions.

Volume of deposit, bank size, cash reserve requirement, and inflation rate have positive and significant impact on bank loan and advance where as liquidity ratio and interest rate have negative and significant impact on loan and advance.

Generally, the finding of the study failed to reject four hypotheses that indicate the relationship between bank's loan and advance and volume of deposit, bank size, liquidity ratio, and interest rate whereas, rejected the two hypotheses indicating the relationship between bank's loan and advance and cash reserve requirement and inflation rate. GDP growth rate had insignificant impact on bank's loan and advance in Ethiopia.

The study observed a relationship between bank lending behavior and a set of macroeconomic indicators and bank level characteristics. Bigger banks seem to be in a better position to lend more than others. This might be due to enough resources they have to cushion lending.

Commercial banks remain dominant in the banking system in terms of their shares of total assets and deposit liabilities. Their total loans and advances, a major component of total credits to the

private sector are still on the increase in spite of the major constraints posted by the government regulations, institutional constraints and other macro economic factors.

However, both government and commercial banks should be mindful of the facts that the environments in which they operate are important factors in the bank performance and behavior. Where the environment is conducive and supportive, performance is enhanced and good lending behavior guaranteed. But where the environment is unstable and harsh, the bank's performances suffer. It therefore follows that effort should be made by commercial banks to enforce the most easily realizable policies and good credit management in every situation.

Based on the findings of the study, the following suggestions were recommended:

- ✓ Commercial banks should strategize on how to attract and retain more deposits so as to further improve on their lending performance.
- ✓ It is essential for commercial banks to build system and skills in liquidity management, assets and liability management.
- ✓ There should be closer consultation and cooperation between commercial banks and the regulatory authorities so that the effect of regulatory measure on commercial banks will be taken into account at the stage of policy formulation.
- ✓ Commercial banks should ensure good planning which encompasses budgeting, reviews and incentives. They should formulate critical, realistic and comprehensive strategic and financial plans. This will help them be better positioned to enjoy the positive effects of macroeconomic factors such as change in gross domestic product and inflation rate.
- ✓ Banks should try as much as possible to strike a balance in their loan pricing decisions. This will help them to be able to cover cost associated with lending and at the same time, maintain good banking relationship with their borrowers.
- ✓ There has to be further research on the area of determinants of banks lending behavior and including its impact on financial performance in Ethiopia by incorporating regulatory factors and other bank specific and macroeconomic factors.

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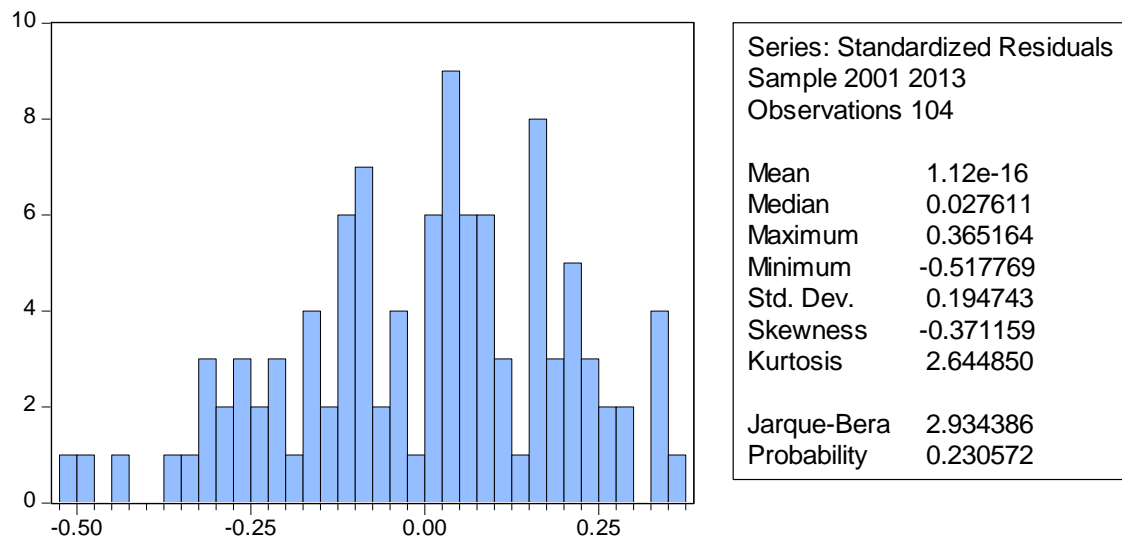
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APPENDICES

Appendix -1- Normality test for LOA



Appendix – 2 Heteroskedasticity Test: White

F-statistic	0.658484	Prob. F(33,70)	0.9063
Obs*R-squared	24.63662	Prob. Chi-Square(33)	0.8527
Scaled explained SS	29.89781	Prob. Chi-Square(33)	0.6700

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/1/14 Time: 10:43

Sample: 2001 2013

Included observations: 104

Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.733777	20.75340	-0.372651	0.7105
VD	0.549142	1.286464	0.426862	0.6708
VD^2	-0.374944	0.440169	-0.851818	0.3972
VD*LR	0.620651	0.497618	1.247244	0.2165
VD*SIZE	-0.013336	0.064489	-0.206796	0.8368
VD*IR	-0.350922	4.106334	-0.085459	0.9321
VD*RR	0.324962	1.206338	0.269379	0.7884
VD*GDP	0.101539	0.883742	0.114897	0.9089
VD*INF	0.067430	0.389499	0.173119	0.8631
LR	1.628892	1.030650	1.580450	0.1185
LR^2	-0.148566	0.282095	-0.526652	0.6001
LR*SIZE	-0.075954	0.036704	-2.069383	0.0422
LR*IR	-3.123054	4.563180	-0.684403	0.4960
LR*RR	1.315180	1.045543	1.257892	0.2126
LR*GDP	-0.711741	0.897235	-0.793260	0.4303
LR*INF	0.368453	0.334446	1.101683	0.2744

SIZE	0.240245	0.136358	1.761870	0.0825
SIZE^2	-0.003123	0.002824	-1.105962	0.2725
SIZE*IR	-0.561382	0.471790	-1.189899	0.2381
SIZE*RR	-0.021381	0.084620	-0.252672	0.8013
SIZE*GDP	0.102026	0.074550	1.368548	0.1755
SIZE*INF	0.000469	0.032086	0.014608	0.9884
IR	82.38494	346.9989	0.237421	0.8130
IR^2	-301.2924	1422.449	-0.211813	0.8329
IR*RR	-35.83845	79.76438	-0.449304	0.6546
IR*GDP	20.88194	175.0016	0.119324	0.9054
IR*INF	0.345912	10.49296	0.032966	0.9738
RR	2.923678	4.747698	0.615810	0.5400
RR^2	-0.048404	7.728732	-0.006263	0.9950
RR*GDP	7.033611	58.94753	0.119320	0.9054
RR*INF	-0.266119	4.636957	-0.057391	0.9544
GDP	-3.448379	17.38436	-0.198361	0.8433
GDP^2	-7.813590	15.16419	-0.515266	0.6080
GDP*INF	-3.739464	11.30859	-0.330675	0.7419

R-squared	0.236891	Mean dependent var	0.004102
Adjusted R-squared	-0.122861	S.D. dependent var	0.019915
S.E. of regression	0.021103	Akaike info criterion	-4.620854
Sum squared resid	0.031174	Schwarz criterion	-3.756342
Log likelihood	274.2844	Hannan-Quinn criter.	-4.270615
F-statistic	0.658484	Durbin-Watson stat	1.280873
Prob(F-statistic)	0.906280		

Appendix -3 Breusch-Godfrey Serial Correlation LM

Test:

F-statistic	1.485285	Prob. F(10,62)	0.1665
Obs*R-squared	15.46108	Prob. Chi-Square(10)	0.1161

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/1/14 Time: 12:59

Sample: 2004 2013

Included observations: 80

Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.103232	1.008351	-0.102377	0.9188
LVD	-0.083249	0.156498	-0.531950	0.5967
LLR	-0.019291	0.052581	-0.366885	0.7150
SIZE	0.005969	0.014513	0.411273	0.6823
LIR	-0.032353	0.306002	-0.105730	0.9161
LRR	-0.032436	0.035557	-0.912251	0.3652
LGDP	0.090630	0.181037	0.500617	0.6184
LINF	0.017364	0.022008	0.788958	0.4331
RESID(-1)	0.527522	0.166870	3.161268	0.0024
RESID(-2)	0.122919	0.224456	0.547630	0.5859
RESID(-3)	-0.117958	0.227982	-0.517398	0.6067
RESID(-4)	0.121288	0.154629	0.784381	0.4358
RESID(-5)	-0.202132	0.146489	-1.379845	0.1726
RESID(-6)	-0.089702	0.150373	-0.596531	0.5530
RESID(-7)	0.098782	0.149887	0.659043	0.5123
RESID(-8)	-0.170165	0.151804	-1.120953	0.2666

RESID(-9)	0.110953	0.159061	0.697553	0.4881
RESID(-10)	-0.148806	0.154937	-0.960430	0.3406
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R-squared	0.193263	Mean dependent var	5.70E-16	
Adjusted R-squared	-0.027938	S.D. dependent var	0.116380	
S.E. of regression	0.117994	Akaike info criterion	-1.241257	
Sum squared resid	0.863201	Schwarz criterion	-0.705301	
Log likelihood	67.65028	Hannan-Quinn criter.	-1.026377	
F-statistic	0.873697	Durbin-Watson stat	1.718350	
Prob(F-statistic)	0.605560			
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Appendix - 4 Fixe effect regressions out put

Dependent Variable: LOA

Method: Panel Least Squares

Date: 05/1/14 Time: 11:57

Sample: 2001 2013

Periods included: 13

Cross-sections included: 8

Total panel (balanced) observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.018282	0.298046	6.771707	0.0000
VD	0.328072	0.151530	2.165068	0.0331
LR	-0.431495	0.068520	-6.297389	0.0000
SIZE	0.332640	0.014322	23.22544	0.0000
IR	-2.125871	0.880210	-2.415187	0.0178
RR	0.681576	0.207709	3.281404	0.0015
GDP	0.115783	0.172904	0.669633	0.5048
INF	0.199906	0.072045	2.774734	0.0067

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.821833	Mean dependent var	9.298294
Adjusted R-squared	0.793807	S.D. dependent var	0.487680
S.E. of regression	0.057988	Akaike info criterion	-2.494649
Sum squared resid	0.299271	Schwarz criterion	-2.113246
Log likelihood	156.6718	Hannan-Quinn criter.	-2.340132
F-statistic	29.32366	Durbin-Watson stat	1.880016
Prob(F-statistic)	0.000000		

Appendix- 5 Correlation matrixes

	LOA	VD	LR	SIZE	IR	RR	GDP	INF
LOA	1.0000							
VD	0.3119	1.0000						
LR	0.0691	0.1650	1.0000					
SIZE	0.9856	0.2877	0.1520	1.0000				
IR	0.2046	-0.0957	0.0036	0.2348	1			
RR	0.4088	0.0176	0.2151	0.4040	0.3186	1		
GDP	0.3403	0.0647	0.0141	0.3348	0.1640	0.2880	1	
INF	0.4554	0.0103	0.0983	0.4474	0.2659	0.2724	0.3142	1