

The Effect of Bank Regulation on Financial Performance of Private Commercial Banks in Ethiopia



A Thesis Submitted To the School Of Graduate Studies of Jimma University In Partial Fulfillment of the Requirements for the Award Of The Degree of Master of Science in Accounting and Finance

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DECLARATION

I hereby declare that this research entitled “The effect of bank regulation on financial performance of private commercial banks in Ethiopia” that will be carried out by me under the guidance and

The thesis is original and has not been submitted for the award of any degree or diploma to any University or institutions.

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This is to certify that the thesis prepared by Yohanes Lewi on *the* title the effect of bank regulation on financial performance of private commercial banks in Ethiopia which a research Thesis summated to the school of graduate studies of Jimma university in partial fulfillment of the requirement for the award of master's degree in accounting and finance (MSC) this, complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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A b s t r a c t

The Effect of Bank Regulation is one of the major concerns for banks and thus achieving the optimum level of liquidity is crucial. The main objective of this study is to investigate The Effect of Bank Regulation on Financial Performance of Private Commercial Banks in Ethiopia. In order to achieve the research objectives, data was collected from a sample of six private commercial banks in Ethiopia over the period from 1999 to 2019. Bank specific variables were analyzed by using the balanced panel regression model. Bank Regulation is measured in two ratios: leverage and loan ratios. The result of this study confirmed that, among the bank specific variables legal reserve and liquidity reserve had statistically significant impact on the determination liquidity of Ethiopian private commercial banks measured by leverage and capital requirement, deposit reserve ,legal reserve ,non-performance loan ,saving interest rate and liquidity reserve statistically significant impact with loan ratio. Whereas except legal reserve and liquidity reserve all other variable had no statistically significant impact on the determination of Bank Regulation of Ethiopian private commercial banks, The negative relationship between capital requirement and liquidity was opposite to our hypothesis but consistent with the “too big to fail” hypothesis. The coefficient sign for capital requirement revealed negative relationship with liquidity and it was in line with our hypothesis and the finance theory. However, capital requirement and deposit reserve have no statistically significant effect on the liquidity of Ethiopian private commercial banks. For leverage liquidity reserve is significant at 1%, banks and legal reserves at 5% while for loan ratio time, deposit reserve, liquidity reserve and non-performance loan are significant at 1%, legal reserve at 5%, capital requirement at 10%. Liquidity reserve is significant at 1% for both leverage and loan ratio.

Keywords: The Effect of Bank Regulation, Ethiopian private commercial banks, liquidity ratio, OLS regression model.

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Acronyms

AIB: Awash International Bank SC

BOA: Bank of Abyssinia SC

CLRM: Classical linear Regression Model

CR: Capital Requirement

DB: Dashen Bank SC

DR: Deposit Reserve

LeR: Legal Reserve

LiR: Liquidity Reserve

MO FED: Ministry of Finance and Economic Department

NBE: National Bank of Ethiopia

NIB: Nib International Bank SC

NPL: Non- performing Loan

OLS: Ordinary Least Square

UB: United Bank SC

WB: Wegagen Bank SC

Chapter One

Introduction

1.1 Background of the Study

In the last two decades of the 20th century, countries worldwide have had to face an unprecedented number of commercial bank failures. As a result, attention is turning to the need for more appropriate ways to improve the performance of national financial systems. Indeed, a substantial literature is already emerging on the causes and consequences of financial-mostly banking-crises, and on various reforms that might help prevent future crises. Although the proposed reforms differ in important respects, nearly all include changes in existing financial regulations and supervisory standards. This core of agreement is certainly understandable insofar as the financial crises in countries ranging from the United States and Japan to Korea and Mexico, to Chile and Thailand, to India and Russia, and to Ghana and Hungary have been blamed at least in part on "bad" regulation and supervision (Barth et al., 2006)

The special role that banks play in the economic system implies that banks should be regulated and supervised not only to protect investors and consumers but also to ensure systemic stability. More specifically, bank regulations exist for safeguarding the industry against systemic risk, protecting consumers from excessive prices or opportunistic behavior and finally to achieve some social objectives, including stability (Llewellyn, 1999). Last but not least regulation is important for the efficiency of the banking industry. In this respect, it is noticeable that whenever regulation is implemented with the aim of restricting or limiting banking activities, the banks "conduct of business and the efficiency with which they operate will be affected. This in turn could induce banks to engage in riskier activities and /or to invest in ways to circumvent regulation. According to some studies, it could even ultimately affect economic growth (Jalilian et al., 2007).

The capital requirement is one of the bank regulations, which sets a framework on how banks and depository institutions must handle their capital. The Categorization of assets and capital is highly standardized so that it can be risk weighted. Capital adequacy has been the focus of many studies and regulator as it is considered to be one of the main drivers on any institutions performance (Bourke, 1989). In contrast other studies argue that in a world of perfect financial market, capital structure and hence capital regulation is irrelevant (Modigliani and Miller, 1958).

However, White and Morrison (2001) posited that the regulator ensures that banks enough of their own capital at stake. Financial performance is the primary goal of all commercial bank. Without financial performance the business will not survive in the long run.

Research on these types of issues, therefore, is critical because it will enable to identify the particular mix of regulations and supervisory standards promote well-functioning of private commercial banks in Ethiopia and thus provide better guidance to policy makers on appropriate reforms. Already, ongoing research is significantly improving understanding of the broad relationships between the type of legal system within a country and its banking sector.

1.2 Statement of the Problem

The financial sector is one of the most heavily regulated sectors in the economy and banking is by far the most heavily regulated industry. Bank regulation typically refers to the rules that govern the behavior of banks, whereas supervision is the oversight that takes place to ensure that banks comply with those rules. The issue of financial regulation particularly in relation to the banking sector is often considered a controversial issue. Regulation is costly and can give rise to moral hazard problems. In addition distortions between regulated and unregulated institutions can occur (Barth et al., 2006).

Barth et al. (2004) find that increasing the level of restrictions move together with crises. Similarly, more restriction comes with lower level of bank development. However, they do not provide a clear-cut explanation on the nature of relationship. While, expect that regulators are ill-equipped with crises for a number of reasons, the direction of causality requires more work. It is our expectation that causality works both ways. Powerful regulators may not correctly find problems and cures for them. On the other hand, expected crises provide more reasons to control. In accordance with Article 55(1) of the constitution of the Federal Democratic Republic of Ethiopia, the NBE is established to control the financial system and monetary policy of the country. This monetary policy refers to a bundle of actions and regulatory stances taken by the central bank including; setting minimum interest rates on deposits or the rediscount rate charged to Commercial banks, borrowing reserves, setting reserve requirements on various classes of deposits, increasing or decreasing commercial bank reserves through open market purchases or sales of government securities.

Furthermore, regulatory actions to constrain commercial bank financial activity or to set minimum capital requirements, intervention in foreign exchange markets to buy and sell domestic currency for foreign exchange and decide on the level of required reserve of commercial banks total deposit.

In Ethiopia, National Bank exercises control over the banking sector through issuance of directives pertaining formation and operation of a banking business. Most of the directives on operation aim at reducing risk of liquidity and solvency in the banking system. Some of NBE's directives are issued as part of the central bank's conduct of monetary policy and some are issued to ensure that the sector plays adequate role in channeling funds to priority sectors of the economy. Most notable action by NBE is its revision of the reserve requirement to combat skyrocketing inflation in the country.

The national bank of Ethiopia had regulated new directive that forced private banks to invest in NBE bill in order to support other sectors from 2013 till 2019. Prior studies conducted in Ethiopia are mainly on the effect of this regulation. There are a number of studies conducted on the effect of NBE Bill purchase (Eden, 2014; Shibiru, 2014 and Tesfaye, 2015). But, they do not consider on equity investment and capital requirement regulation. Thus, incorporating these crucial bank regulation variables collectively is what motivated the researcher to put his own role to examine how financial performance of Ethiopian private commercial banks has been affected by NBE regulation.

1.3 Objective of the Study

1.3.1 General objective

The general objective of the study is to determine the effect of bank regulation on financial performance of private commercial banks in Ethiopia.

1.3.2 Specific objectives

In order to achieve the general objective the researcher attempts to include the following specific objectives:-

- ✓ To study the influence of capital requirement regulations on financial performance of commercial banks in Ethiopia.

- ✓ To examine the effect of legal reserve requirement on financial performance of commercial banks in Ethiopia.
- ✓ To investigate the effect of saving interest rate on financial performance of private commercial banks in Ethiopia.
- ✓ To study the effect of deposit reserve on financial performance of private commercial banks in Ethiopia.
- ✓ To examine the effect of liquidity reserve on financial performance of private commercial banks in Ethiopia.
- ✓ Investigate the effect of non-performing loan on the financial performance of private commercial banks in Ethiopia.

1.4 Research hypothesis

H1= Capital requirement regulation For the banks positively and significantly affects banks financial performance.

H0= Capital requirement regulation of the banks does not affects banks financial performance.

H2= Legal reserve requirement positively affects banks financial performance.

H0= Legal reserve requirement can't affects banks financial performance.

H3= saving interest rate positively affects banks financial performance.

H0= saving interest rate negatively affects banks financial performance.

H4= Deposit reserve regulation positively affects banks financial performance.

H0= Deposit reserve regulation can't affects banks financial performance.

H5= Liquidity reserve positively affects banks financial performance.

H0= Liquidity reserve negatively affects banks financial performance.

H6= Non performing loan regulation positively affects banks financial performance.

H0= Non performing loan regulation negatively affects banks financial performance.

1.5 Importance of the Study

This study is for importance to the banking sector to gain understanding in the patterns of the bank regulations and the objective of performance of commercial banks in Ethiopia. It is also be of benefit to the number of players in the Ethiopia banking regulatory such as National Bank of

Ethiopia in order to improve regulations in the industry. This study will contribute to the knowledge of Commercial banks of how maintain and sustain performance by following the rules of the industry. The study will advance the literature on bank regulation and is a basis for further research. Very few research and studies have been done assessing the regulation of banks in Ethiopia. Findings for this study will help the Government of Ethiopia in reforming banking regulation that pertains to the running of banking industry.

1.6 . Scope of the study

This paper is confined in identifying the effect of regulation on financial performance of private commercial banks in Ethiopia. Though there are sixteen private owned commercial banks in Ethiopia, the study selected only six privately owned commercial banks that have at least twenty years of experience at the end of June 30, 2018/19. In doing, so 20 years of secondary data will be covered from 1999 up to 2018/19.

1.7 Organization of the study

The paper will be organized into five chapters. Chapter one will present introduction of the study. The literature review part of the study will be presented in chapter two. The review of the literature includes the theoretical review in its first section which is followed by the review of the previous studies related to the area and summary and concluding remarks. Chapter three will present the research design and model specification. This will be followed by an analysis of the results and discussion part of the paper concurrently in chapter four. Finally, chapter five will present the conclusions and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Literature

In explain the relationship between regulation and financial performance of commercial banks in Ethiopia, several theories have been advanced. Banking regulations have attracted both theoretical and empirical interest and several studies attempt to assess whether and how the regulatory frame work influences the profitability and behavior of banks.

2.2 Overall Regulation

According to Coglianesse (2012) the word “regulation” itself can mean many things and has been defined variously by various researchers. At its most basic level,” regulation” is treated as synonymous with law .They are rules or norms adopted by government and backed up by some threat of consequences, usually negative ones in the form of penalties. According to Orbach(2012) regulation is state intervention in the private domain, which is a byproduct of our imperfect reality and human limitations.

Regulation is defined as the public administrative policing of private activities based on a set of rules that were developed in the public interest. When the definition is applied to the financial system, it is termed financial regulation and refers to a process in which there is a monitoring of the financial institutions by a body that is directed by the government in an effort to achieve macroeconomic goals through monetary policies as well as other measures permissible by law. Thus regulations are concerned, they must be extensively considered and skillfully administered because in appropriate or ineffective regulatory measures results in catastrophic economic problems Greenidge (2006).

Kirkpatrick (2004) defined regulation as the diverse set of instruments by which governments set requirements on enterprises and citizens. Regulations include laws, orders and rules issued by all level of governmental bodies to which governments have delegated regulatory powers. Regulation can take many forms and the form of regulation policy adopted in developing

countries has shifted over the time. Regulations touch our everyday life in thousand ways that we may never imagine (Brito, 2012).

2.3 Bank Regulation

Banking regulation in its strictest sense refers to the framework of law and rules under which banks operate Banking law and regulation extend to various aspects of banking, including who can open banks, what products can be offered and how banks can expand Kenneth, (2000). Prudential banking regulation is designed to protect the banking system from crises because banking crises typically affect the entire economy. The most important rationale for regulation in banking is to address concerns over the safety and stability of financial institutions, the financial sector as a whole, or the payments system Bonn, (2005).

2.4 Why Banks are regulated

According to Kenneth (2000) banks are operated for profit and bankers are free to make many decisions in their daily operations, banking is commonly treated as a matter of public interest. Banking laws and regulations extend too many aspects of banking, including who can open banks, what products can be offered, and how banks can expand. No central architect was assigned to design the overall system or lay out a single set of principles.

Instead, many people with many viewpoints, objectives, and experiences have been responsible for the current supervisory framework. As a consequence, bank regulation has evolved to serve numerous goals which have changed over time and on occasion even been in conflict with one another. According to Keneth (2000), the following are why banks are regulated. Also, because of the potential for conflict among regulatory goals, special attention is given to what banking regulation should not do.

Protection of depositors

The most basic reason for regulation of banking is depositor protection. Pressure for such regulation arose as the public began making financial transactions through banks, and as businesses and individuals began holding a significant portion of their funds in banks. Banking poses a number of unique problems for customers and creditors. First, many bank customer's use

a bank primarily when writing and cashing checks and carrying out other financial transactions
Kenneth (2000).

To do so, they must maintain a deposit account. As a consequence, bank customers assume the role of bank creditors and become linked with the fortunes of their bank. This contrasts with most other businesses, where customers simply pay for goods or services and never become creditors of the firm. A second problem for bank depositors is that under the fractional reserve system of banking, deposits are only partially backed by the reserves banks hold in the form of cash and balances maintained with the Federal Reserve.

As a result, depositor safety is linked to many other factors as well, including the capital in a bank and the condition and value of its loans, securities, and other assets. While depositors could conceivably make general judgments about the condition of banks, the task would still be difficult, costly, and occasionally prone to error. These facts, especially when combined with the history of depositor losses before federal deposit insurance, explain much of the public pressure for banking regulation to protect depositor sKenneth (2000).

Monitory and financial stability

Apart from just being concerned about individual depositors, banking regulation must also seek to provide a stable framework for making payments. With the vast volume of transactions conducted every day by individuals and businesses, a safe and acceptable means of payment is critical to the health of our economy. In fact, it is hard to envision how a complex economic system could function and avoid serious disruptions if the multitude of daily transactions could not be completed with a high degree of certainty and safety. Ideally, bank regulation should thus keep fluctuations in business activity and problems at individual banks from interrupting the flow of transactions across the economy and threatening public confidence in the banking system
Kenneth (2000).

Efficient and competitive financial system

Another aspect of a good banking system is that customers are provided quality services at competitive prices. One of the purposes of bank regulation, therefore, is to create a regulatory framework that encourages efficiency and competition and ensures an adequate level of banking

services throughout the economy. Efficiency and competition are closely linked together (Barth et. al 2006).

In a competitive banking system, banks must operate efficiently and utilize their resources wisely if they are to keep their customers and remain in business. Without such competition, individual banks might attempt to gain higher prices for their services by restricting output or colluding with other banks. Competition is also a driving force in keeping banks innovative in their operations and in designing new services for customers. A further consideration is that for resources throughout the economy to flow to activities and places where they are of greatest value, competitive standards should not differ significantly across banking markets or between banking and other industries (Barth et. al 2006).

Consumer protection

Another goal of banking regulation is to protect consumer interests in various aspects of a banking relationship. The previous regulatory objectives serve to protect consumers in a number of ways, most notably through safeguarding their deposits and promoting competitive banking services. However, there are many other ways consumers are protected in their banking activities. These additional forms of protection have been implemented through a series of legislative acts passed over the past few decades Bhattachyra (1998).

Bank Supervisory Role of the Central Bank

Countries must also decide whether to assign responsibility for bank supervision to the central bank. As with the issue of single or multiple bank supervisors, the conceptual literature is split. Perhaps the most strongly emphasized argument in favor of assigning supervisory responsibility to the central bank is that as a bank supervisor, the central bank will have first-hand knowledge of the condition and performance of banks (Barth et. al 2006).

This in turn can help it identify and respond to the emergence of a systemic problem in a timely manner. Those pointing to the disadvantages of assigning bank supervision to the central bank stress the inherent conflict of interest between supervisory responsibilities and responsibility for monetary policy (Barth et. al 2006).

The conflict could become particularly acute during an economic downturn, in that the central bank may be tempted to pursue a too-loose monetary policy to avoid adverse effects on bank earnings and credit quality, and/or encourage banks to extend credit more liberally than warranted based on credit quality conditions to complement an expansionary monetary policy. As with the single-multiple bank supervisor debate, a useful first step in addressing the debate over the bank supervisory role of the central bank is to ascertain basic facts (Barth et al., 2006).

2.5 The financial regulations

Financial regulation can be classified into groups according to their aims and functions. The three most common classifications are the following; which are outlined in (Williams, 1996).

Structural regulations: - are boundaries placed on commercial banks determining the activities in which they can participate from those from which they are debarred. Licensing of commercial banks and prohibitions from engaging in commercial activities, are examples of structural regulations used. **Monetary regulation:** - is the process of setting monetary policy directives designed to bring about predetermined macroeconomic outcomes by focusing on interest rates, credit controls and primary and secondary reserve requirements. It impacts on the deposit taking and lending activities of commercial banks through adjustments in price, volume, portfolio change and risk taking.

2.6 The impact of regulatory measures

Regulations impact on the very structure of the banking system since they present the stipulations and restrictions that must be considered in the banks entire series of operations. But in terms of optimality, it remains to be answered whether all the restrictions in place are necessary. Bhattacharya (1998) had some notable conclusions when he set out to survey modern literature on bank regulation, exploring the implications for optimal regulation.

Among the conclusions were:

- I. Imposing restrictions on banks investment may limit the liability of the deposit insurance fund, affecting the optimal configuration of banking and may reduce charter values as a result.
- II. Risk sensitive capital requirements and risk calibrated deposit insurance premia are potentially useful regulatory tools in coping with moral hazard.

III. If bank closure policy is improved and discipline brought to bear, it could attenuate the moral hazard problems related to deposit insurance

IV. Increasing banks charter values can also help to dampen the risk-taking propensities of the insured banks.

V. If universal banking is permitted it facilitates reusability of information and stimulates investments.

Further Bhattacharya (1998) suggests that restricting banks to financing themselves does not sacrifice efficiency; bank sizes should not be restricted and financing with non-traded demand deposit contracts without constraints on the associated interest rate patterns should be permitted. Therefore, it can be concluded that although restrictions have their place in the financial system, they are not all beneficial to the public nor the banking system and sometimes the economy as a whole. Measures such as interest rate ceilings and floors, exchange and credit controls and reserve requirement are typical tools for the central bank to use in their effort to regulate the banks. One school of thought is that where there are no deposit rate ceilings, banks will bid up deposit interest rates which in turn will cause them to seek out higher yielding riskier assets to justify the high deposit rates.

2.8 Banking Regulation: The Risk of Bank Runs and Of Moral Hazard in Banking and Their Effects on the Economy

As cited in Bonn (2005). It is widely accepted that in the absence of market failures, open and competitive markets yield strong incentives to efficiently meet the demands of consumers and to adapt to changing demands and technology over time. With very few exceptions, in the absence of a market failure there is no economic justification for regulation.

The most important rationale for regulation in banking is to address concerns over the safety and stability of financial institutions, the financial sector as a whole, or the payments system. The description and the evaluation that follows necessarily reflect the views of competition authorities. With only one exception, no bank regulator has reviewed this report, which therefore, does not necessarily reflect the positions and the opinions of bank regulators.

The risk of bank runs

All banks operate in conditions of fractional liquidity reserve. The great majority of banks liabilities are very liquid deposits redeemable on demand. The great majority of their assets are instead much more illiquid loans. This situation leads to the problem that if all depositors demanded their deposits back at the same time, any bank (even if perfectly solvent) would face serious problems in meeting its obligations vis à vis its depositors Bonn (2005).

A single bank might obtain refinancing on the financial market but the problem would severely persist in cases of low liquidity on the market or if the issue concerned a big portion of the banking sector. It is well known in the literature that whenever depositors start fearing the insolvency of their bank, their first most common reaction is to go and withdraw their deposits creating serious problems to the banks. Such behavior is normally referred to as a bank run Bonn (2005).

The risk of excessive risk taking (moral hazard) in banking

Banks grant loans normally financed by the deposits they received. This is by itself a powerful incentive for banks to grant credit in a not sufficiently prudent way and to take in too much risk. In fact it is well known in the literature that with debt financing, while the risk of failure of the financed investment is mostly carried out by the bank depositors, in the case of success profits accrue mostly to the bank. A good example of this deviating behavior is the Asian financial crisis of 1997 that is mentioned further below Bonn (2005).

In general, however, this incentive is somehow mitigated by the possibility that the market, both via depositors and via other banks, could monitor the risks assumed by the bank's management. The main purpose of regulation is to avoid the highly negative consequences for the economy of widespread bank failures. There are two main strands of arguments for banking regulation. The first focuses on the systemic dangers of bank failures, while the second on the need for security and stability in the payments system Bonn (2005).

Systemic dangers of a bank failure

The main argument for bank regulation focuses on the possibility of systemic or system-wide consequences of a bank failure i.e. the possibility that the failure of one institution could lead to the failure of others. This argument is summarized by Feldstein as follows:

The banking system as a whole is a public good that benefits the nation over and above the profits that it earns for the banks' shareholders. Systemic risks to the banking system are risks for the nation as a whole. Although the management and shareholders of individual institutions are, of course, eager to protect the solvency of their own institutions, they do not adequately take into account the adverse effects to the nation of systemic failure. Banks left to themselves will accept more risk than is optimal from a systemic point of view. That is the basic case for government regulation of banking activity and the establishment of capital requirements. It is possible to distinguish two mechanisms by which the failure of one bank could lead to the failure of other banks or other non-bank firms:

(a) The failure of one bank leading to a decline in the value of the assets sufficient to induce the failure of another bank ("consequent failure") and (b) The failure of one bank leading to the failure of another fully solvent bank, through some contagion mechanism ("contagion failure") (Barth et al., 2006).

2.9 Supervisory policies and profitability

Given the interconnectedness of the banking industry and the reliance that the national and global economy hold on banks, it is important for regulatory agencies to maintain control over the standardized practices of these institutions, government regulation and supervision of banks promotes their safety and soundness in order to protect the payments system from bank runs that contract bank lending and threaten macroeconomic stability. Protecting the payments system frequently involves deposit insurance (Barth et al., 2006).

To the extent that the insurance is credible, it reduces depositors' incentive to run banks when they fear banks' solvency. Consequently, it reduces banks' liquidity risk and, to the extent it is underpriced, gives banks the incentive to take additional risk for higher expected return (Barth et al., 2006).

2.10 Theoretical and policy debates

As cited Bonn (2005) this section discusses seven policy issues. For each issue, the researcher : (1) stress the conflicting theoretical predictions and policy debates, (2) emphasize that specific regulations and supervisory practices are so inextricably interrelated it is important to examine them simultaneously.

Regulations on bank activities and banking-commerce links

There are five main theoretical reasons for restricting bank activities and banking commerce links. First, conflicts of interest may arise when banks engage in such diverse activities as securities underwriting, insurance underwriting, and real estate investment. Such banks, for example, may attempt to “dump” securities on ill-informed investors to assist firms with outstanding loans. Second, to the extent that moral hazard encourages riskier behavior, banks will have more opportunities to increase risk if allowed to engage in a broader range of activities. Third, complex banks are difficult to monitor. Fourth, such banks may become so politically and economically powerful that they become “too big to discipline.” Finally, large financial conglomerates may reduce competition and efficiency. According to these arguments, governments can improve banking by restricting bank activities Bonn (2005).

There are alternative theoretical reasons for allowing banks to engage in a broad range of activities, however. First, fewer regulatory restrictions permit the exploitation of economies of scale and scope. Second, fewer regulatory restrictions may increase the franchise value of banks and thereby augment incentives for more prudent behavior. Lastly, broader activities may enable banks to diversify income streams and thereby create more stable banks Bonn (2005).

Regulations on domestic and foreign bank entry

Economic theory provides conflicting views on the need for and the effect of regulations on entry into banking. Some argue that effective screening of bank entry can promote stability. Others stress that banks with monopolistic power possess greater franchise value, which enhances prudent risk-taking behavior Others, of course, disagree, stressing the beneficial effects of competition and the harmful effects of restricting entry Shleifer et al. (1998).

Regulations on capital adequacy

Traditional approaches to bank regulation emphasize the positive features of capital adequacy requirements. Capital serves as a buffer against losses and hence failure. Furthermore, with limited liability, the proclivity for banks to engage in higher risk activities is curtailed with greater amounts of capital at risk. Capital adequacy requirements, especially with deposit insurance, play a crucial role in aligning the incentives of bank owners with depositors and other creditors Shleifer et al. (1998).

Deposit insurance design

Countries adopt deposit insurance schemes to prevent widespread bank runs. If depositors attempt to withdraw their funds all at once, illiquid but solvent banks may be forced into insolvency. To protect payment and credit systems from contagious bank runs, many favor deposit insurance plus powerful official oversight of banks to augment private-sector monitoring of banks. Deposit insurance schemes come at a cost, however. They may encourage excessive risk-taking behavior, which some believe offsets any stabilization benefits.

Yet, many contend that regulation and supervision can control the moral-hazard problem by designing an insurance scheme that encompasses appropriate coverage limits, scope of coverage, coinsurance, funding, premier structure, management and membership requirements Shleifer et al. (1998).

2.11 Supervision

Some theoretical models stress the advantages of granting broad powers to supervisors. The reasons are as follows. First, banks are costly and difficult to monitor. This leads to too little monitoring of banks, which implies sub-optimal performance and stability.

Official supervision can ameliorate this market failure. Second, because of informational asymmetries, banks are prone to contagious and socially costly bank runs. Supervision in such a situation serves a socially efficient role. Third, many countries choose to adopt deposit insurance schemes. This situation (1) creates incentives for excessive risk-taking by banks, and (2) reduces the incentives for depositors to monitor banks. Strong, official supervision under such circumstances can help prevent banks from engaging in excessive risk-taking behavior and thus improve bank development, performance and stability Kane (1990).

Alternatively, powerful supervisors may exert a negative influence on bank profitability. Powerful supervisors may use their powers to benefit favored constituents, attract campaign donations, and extract bribes. Under these circumstances, powerful supervision will be positively related to corruption and will not improve bank development, performance and stability from different perspective the agency problem between taxpayers and bank supervisors. In particular, rather than focusing on political influence, model the behavior of a self-interested bank supervisor when there is uncertainty about the supervisor's ability to monitor banks Kane (1990).

Under these conditions, they show that supervisors may undertake socially suboptimal actions. Thus, depending on the incentives facing bank supervisors and the ability of taxpayers to monitor supervision, greater supervisory power could hinder bank operations Kane (1990).

Regulations on private sector monitoring of banks

There are disagreements about the role of the private sector in monitoring banks. Some advocate more reliance on private sector monitoring, expressing misgivings with official supervision of banks. Recently, for instance, the Shleifer et al. (1998) view of government regulations specifically holds that banks will pressure politicians who, in turn, can unduly influence supervisory oversight. Furthermore, in some countries, supervisors are not well compensated and hence quickly move into banking, resulting in a situation in which they may face mixed incentives when it comes to strictly enforcing the rules. Since supervisors do not have their own wealth invested in banks, they also have different incentives than private creditors insofar as monitoring and disciplining banks. There are countervailing arguments, however. Countries with poorly developed capital markets, accounting standards, and legal systems may not be able to rely effectively on private monitoring. Furthermore, the complexity and opacity of banks may make private sector monitoring difficult even in the most developed economies. From this perspective, therefore, excessively heavy reliance on private monitoring may lead to the exploitation of depositors and poor bank performance Shleifer et al. (1998).

Government ownership of banks

Economists hold different views about the impact of government ownership of banks. One view holds that governments help overcome capital-market failures, exploit externalities, and invest in strategically important projects. According to this view, governments have adequate information and incentives to promote socially desirable investments. Shleifer et al (1998), in contrast, argue that governments do not have sufficient incentives to ensure socially desirable investments. Government ownership instead politicizes resource allocation, softens budget constraints, and hinders economic efficiency.

2.12 Bank Regulation and financial performance

Bank regulations try to provide this stable framework which seeks to assure certainty and safety to users of the banking payment system which is critical for the wellbeing of the economy. Moreover, apart from maintaining public confidence, banking regulations also try to create a regulatory environment where banks are expected to be efficient and competitive; and are also expected to provide reasonable levels of banking services throughout the economy (Nafis, 2012).

One key component to any financial market is the banking system. Banks facilitate financial development by mobilizing and allocating funds to investment projects with the greatest long-term economic benefits. Moreover, it is widely acknowledged that a well-structured banking system, defined by its supervisory practices, risk taking, and governance, promotes greater financial performance and economic stability (Caprio and Levine, 2006). Promoting sound banking practices, however, has proven to be difficult. Differences with respect to corruption, democracy, and legal origin, for example, create heterogeneous regulatory environments that impede the implementation of universally effective policies. The intent of this study is to empirically evaluate the association between a commercial banking regulation and its overall level of income and income growth.

Effective bank regulation has two main objectives: the first is to protect private interests of depositors, investors, and creditors; the second is to safeguard public or collective interest by promoting the integrity and reputation of financial services markets. The wave of deregulation of the financial services in the 1980s and the recent globalization of the industry have both counterbalanced by a rise in regulations and enforcement actions (Gully, 2005).

Giddy (1984) and Sheng (1999) provide four major reasons why banks should be regulated. The first relates to monetary policy – the ability of banks to create money. Second, as channels of credit or investments, banks are involved in credit allocation. Third, banks are regulated to ensure healthy competition and innovation by preventing the formation of cartels. The fourth is for prudential regulation reasons and to mitigate the problem of asymmetric information. This view is supported by Howells and Bain (2004) who stated that the reason for bank regulation originates from the existence of asymmetric information – the fact that customers of the institutions (banks) are less informed and thus more at a disadvantage about the affairs of the banks than the bank itself.

A general contagious phenomenon appeared to affect several banking systems because of their excessive risk position and their involvement with different subprime products and derivatives. In order to save the banking systems, governments and policy makers put forward several programs, but the latter were not enough and the banking crisis was more severe and rapid than previously expected. Consequently, many banks lost money and some of them went bankrupt. Financial analysts consider that delayed reactions, the status of the central banks and the absence of a centralized banking policy and financial regulations made the interventions less efficient and the crisis more severe. In addition, the decentralized government actions gave rise to more serious debt crises, particularly for European countries, involving serious sovereign risk (Barth et al., 2013). Accordingly, reforming the banking system, and improving financial regulations and supervision were considered more important than ever to protect banks and the economy from future shocks (Aglietta, 2009).

Regulations for banks are being rewritten in response to the global financial crisis, their implementation requires complex steps depending on each country's policies and they could have very different effects on bank profitability depending on institutional environment where banks operate. Furthermore, the existing empirical evidence is inconclusive about the impact of regulatory and supervisory policies on bank performance (Faten, 2013). Thus, the concern of this study is to examine the effect of bank regulation on private commercial banks.

2.13 Determinants of performance of banks

Terance (1989) defines performance measurement as a way of ensuring that resources available are used in the most efficient and effective way. The essence is to provide for the organization the maximum return on the capital employed in the business. Financial performance for banks is very important because managers need to know how well the banks are performing.

Most studies divide the determinants of commercial banks performance into two categories, namely internal and external factors. Internal determinants of profitability, which are within the control of bank management, can be broadly classified into two categories, i.e. financial statement variables and nonfinancial statement variables. While financial statement variables relate to the decisions which directly involve items in the balance sheet and income statement; non-financial statement variables involve factors that have no direct relation to the financial statements. The examples of non-financial variables within the this category are number of branches, status of the branch (e.g. limited or full-service branch, unit branch or multiple branches), location and size of the bank. Haron, (2004), External factors are those factors that are considered to be beyond the control of the management of a bank. Among the widely discussed external variables are competition, regulation, concentration, and market share, and ownership, scarcity of capital, money supply, inflation and size.

2.14 Quantitative Framework for Measuring Bank's Liquidity

Financial institution can mobilizes resources through new deposits, maturing assets, borrowed funds and/or using the discount window (borrowing from the central bank). While financial institution may encounter liquidity risk. According to Rochet (2008), the three sources of liquidity risk are; on the liability side, there is a large uncertainty on the volume of withdrawals of deposits or the rolled-over of inter-bank loans, on the asset side, there is an uncertainty on the volume of new requests for loans that a bank will receive in the future, and off-balance sheet items, like credit lines and other commitments taken by the bank.

Some of the mechanisms to insure liquidity crises are: banks hold buffer of liquid assets on the asset side of the balance sheet such as cash, balances with central banks and other banks, debt securities issued by governments and similar securities or reverse repo trades reduce the probability that liquidity demands threaten the viability of the bank. The second strategy is, banks can rely on the interbank market where they borrow from other banks in case of liquidity demand. The last strategy is that, the central bank typically acts as a Lender of Last

Resort/LOLR to provide emergency liquidity assistance to particular illiquid institutions and to provide aggregate liquidity in case of a system-wide shortage (Aspachs et al. 2005).

The two most widely used approaches to measure liquidity of banks are by liquidity gap approach (flow perspective) or liquidity ratio approach (stock perspective). The liquidity gap/flow approach treats liquidity reserves as a reservoir which the bank assesses its liquidity risk by comparing the variability in inflows and outflows to determine the amount of reserves that are needed during the period. The liquidity gap approach adapts the variation between assets and liabilities both current and future period. A positive liquidity gap means for deficit, requiring for liabilities to be increased (Bassis, 2009).

The liquidity ratio/stock approach, in contrast, employs various balance sheet ratios to identify liquidity trends. The various ratios label for immediate viable source of funding. This indeed entitles portfolio of assets that can be sold off without any fuss and also adequate amounts of stable liabilities. Various authors like Moor (2010), Rychtarik (2009), or Praet and Herzberg (2008) have also provided similar understandings with liquidity ratios such as liquid assets to total assets, liquid assets to deposits, loans to total assets and loans to deposits. In short, the liquidity ratio carries various balance sheet ratios to identify liquidity needs.

Though both approaches are intuitively appealing, the flow approach is more data intensive and there is no standard technique to forecast inflows and outflows. As a result, the stock approaches are more popular in practice and the academic literatures, due to the availability of more standardized method (Crosse and Hempel 1980; Yeager and Seitz, 1989; Hempel et al. 1994). According to Crosse and Hempel (1980), the most popular stock ratios are liquid asset to deposit, loan-to-deposit ratio and the liquid asset-to-total asset ratio. When the higher the loan-to-deposit ratio (or the lower liquid asset to deposit ratio and the liquid asset-to-total asset ratio) the less able a bank to meet any additional loan demand (indicate for less liquidity). Both indicators have their shortcomings: the loan-to-deposit ratio does not show the other assets available for conversion into cash to meet demands for withdrawals or loans, while the liquid assets ratio ignores the flow of funds from repayments, increase in liabilities and the demand for bank funds. Nevertheless, according to Crosse and Hempel (1980), these ratios likely to move in parallel trend.

Hence, to meet the objectives of this study, the liquidity ratio/stock approach was chosen over the flow/liquidity gap approach. The researcher chooses to employ three liquidity ratios to overcome the shortcomings of one from the other. The researcher mainly chooses the liquid asset-to-deposit ratio because the liquidity framework from NBE is favourable towards this ratio. Liquid asset-to-total assets ratio and loan-to-deposit ratio were used as a robustness check.

2.15 Non-performing loans and Bank Liquidity

Non-performing loans are loans & advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment term of the loan or advance is in question (NBE directive No.SBB/43/2008). According to (Ghafoor, 2009), non-15 performing loans are loans that a bank customer fails to meet his/her contractual obligations on either principal or interest payments exceeding the scheduled repayment dates. Thus, NPLs are loans that give negative impact to banks in developing the economy. Rise of non-performing loan portfolios significantly contributed to financial distress in the banking sector. The banking systems play the central role of mobilizing and allocating resources in the market by channeling fund from surplus economic units to deficit economic units. This activity of transforming short term deposit to long term loans & advances will generate most profits for banks. However, it involves high risk and eventually if not managed properly will leads to high amount of non-performing loans. The increased on non-performing loan reflects deteriorated asset quality, credit risk and its inefficiency in the allocation of resources. According to Bloem and Gorter (2001), though non-performing loans may affect all sectors, the most serious impact is on financial institutions which tend to have large loan portfolios. On the other hand, large volume of non-performing loans portfolio will affect the ability of banks to provide credit and leads to loss of confidence and liquidity problems. Therefore, the amount of non-performing loans has a negative impact on bank's liquidity.

2.16 Capital Adequacy and Bank Liquidity

Capital can be defined as common stock plus surplus fund plus undivided profits plus reserves for contingencies and other capital reserves. Besides, a bank's loan loss reserves which serve as a buffer for absorbing losses can be included as bank's capital (Patheja 1994). The primary reason why banks hold capital is to absorb risk including the risk of liquidity crunches, protection against bank runs, and various other risks. According to Moh'd and Fakhris (2013), bank's capital plays a very important role in maintaining safety and solidarity of banks and the security of banking systems in general as it represents the buffer gate that prevents any unexpected loss that banks might face, which might reach depositors funds given that banks operate in a highly uncertain environment that might lead to their exposure to various risks and losses that might result from risks facing banks. The recent theories suggest that, bank capital may also affect banks' ability to create liquidity.

These theories produce opposing predictions on the relationship between capital and liquidity creation.

Under the first view, the “financial fragility-crowding out” theories predicts that, higher capital reduces liquidity creation and lower capital tends to favour liquidity creation (Diamond and Rajan, 2000, 2001). They stated that, depositors will be charged a nominal fee for the intermediary service of loaning out their respective deposits. However, this fee differs according to the borrowers’ capability of repayment. For those with higher risk borrowing but are reluctant to incur higher cost, will provoke depositors to withdraw their funds. Furthermore, Gorton and Winton (2000) show that a higher capital ratio may reduce liquidity creation through another effect: “the crowding out of deposits”. They consider that deposits are more effective liquidity hedges for agents than investments in bank equity. Indeed, deposits are totally or partially insured and withdraw able at par value. By contrast, bank capital is not eligible and with a stochastic value that depends on the state of bank fundamentals and on the liquidity of the stock exchange. Consequently, higher capital ratios shift investors’ funds from relatively liquid deposits to relatively illiquid bank capital. Thus, the higher is the bank's capital ratio; the lower is its liquidity creation. The second view is that, higher capital requirement provide higher liquidity to financial institutions. Where risk absorption theory is realized for higher capital improves the ability of banks to create liquidity. This evidence is provided by Diamond and Dybvig (1983) and Allen and Gale (2004) stating that liquidity creation exposes banks to risk. The greater liquidity needs of banks, incur higher losses due to the disposal of illiquid assets at available market prices rather than the desired prices to meet the customers’ obligations. Al-Khouri (2012) has also found that, bank capital increases bank liquidity through its ability to absorb risk. Thus, under the second view, the higher is the bank's capital ratio, the higher is its liquidity creation

2.17 Interest Rate Margin and Bank Liquidity

Interest rate margin is one of the most important factors that gauge the efficiency of financial institutions. Interest rate margin is the difference between the gross cost paid by a borrower to a bank and the net return received by a depositor (Brock and Suarez 2000). According to (Azeez et al, 2013), interest rate margin is defined as the difference between interest income from loan and advances as a fraction of the total loans and advances and the interest paid out on deposit as a percentage of total deposits. In the financial intermediation process, a bank collects money on deposit from one group (the surplus unit) and grants it out to another group (the deficit unit).

These roles involve bringing together people who have money and those who need money. In such intermediation function, the bank will earn interest from loans & advances and pay interest for depositors. Thus, how well a bank manages its assets and liabilities is measured by the spread between the interest earned on the bank's assets and interest costs on its liabilities.

According to the liquidity preference theory, lenders need high interest rate which includes the liquidity premium in order to lend. The basic idea underlining this theory is that, lenders of funds prefer to lend short, while borrowers generally prefer to borrow long. Hence borrowers are prepared to pay interest rate margin/ a liquidity premium to lenders to induce them to lend long. The size of interest rate margin/ liquidity premium increases with the time to maturity. Therefore, as they got higher premium, lenders give up their liquid money (Pilbeam 2005). Higher interest rate margin will force banks to lend more and reduce their holding of liquid assets. On the other hand, holding of liquid asset reduce the risk that banks may face liquidity shortage in case of unexpected withdrawals and thus as liquid assets increases, a bank's liquidity risks decreases, which leads to a lower liquidity premium component of the net interest margin (Angabazo1997). Therefore, there is a negative relationship between interest rate margin and banks liquidity.

2.18 Empirical Literature

The study has reviewed various empirical studies that are related with the effect of bank regulation on bank profitability by incorporating empirical studies conducted in developed countries and developing countries.

The relationship between regulation and financial performance of commercial banks

Sami et al. (2011) studied on the influence of bank regulation, concentration, and financial and institutional development on commercial bank margins and profitability across a broad selection of Middle East and North Africa (MENA) countries. The empirical results suggest that bank-specific characteristics, in particular bank capitalization and credit risk, have a positive and significant impact on banks' net interest margin, cost efficiency, and profitability. Also, they found that macroeconomic and financial development indicators have no significant impact on net interest margins, except for inflation. Regulatory and institutional variables seem to have an impact on bank profitability.

Mahshidet al. (2011) studied whether regulation banking improves bank soundness. They find a significant and positive relationship between bank soundness and regulation banking. Specifically, countries which require banks to report regularly and accurately their financial data to regulators and market participants have sounder banks. The dependent variable is the bank's financial soundness as measured by its Z-score. These findings emphasize the importance of transparency in making supervisory processes effective and strengthening market discipline. Countries aiming to upgrade banking regulation and supervision should consider giving priority to information provision over other elements of the Core Principles (Michael et al., (2001)

Benh-Khedhiri, Casu, and Sheik-Rahim (2005), study on profitability and interest rates differentials in Tunisian banking industry. More specifically, they focused on the determinants of credits unions' net interest margins as indicators of the sector's efficiency. The study seeks to establish the direct effects of capital regulations and capital requirements. Not all researchers agree that capital regulation has had significant effects on Financial Institutions. Jackson et al. (1999) review a number of prior studies investigating how capital adequacy regulation influence actual capital ratio; such as Rime (2001). Jackson et al conclusion is that in the near term financial mainly respond to strict capital adequacy by reducing lending and that there is little conclusive evidence that capital regulation has induced financial institutions to maintain higher capital to assets ratios than the otherwise would choose if unregulated. Related empirical research that focuses on other aspects of banks' performance also seems to generate mixed findings. Barth et al. (2004) find that while stringent capital requirements are associated with fewer non-performing loans, capital stringency is not robustly linked to banking sector stability, development or performance, when controlling for banks. However, because capital is more expensive than deposits, banks will generally choose to operate with the minimum capital level specified by differences in regulatory regimes. Pasiouras et al. (2006) find a negative relationship between capital requirements and banks' soundness as measured by Fitch ratings. In contrast, Pasiouras (2008) reports a positive association between technical efficiency and capital requirements, although this is not statistically significant in all cases. The empirical results are yet again mixed. Barth et al. (2004) indicate that there is no strong association between bank development and performance and official supervisory power. However, the results of Barth et al. (2002) show those more powerful government supervisors are associated with higher levels of non-performing loans, while Barth et al. (2003) find that official government power is

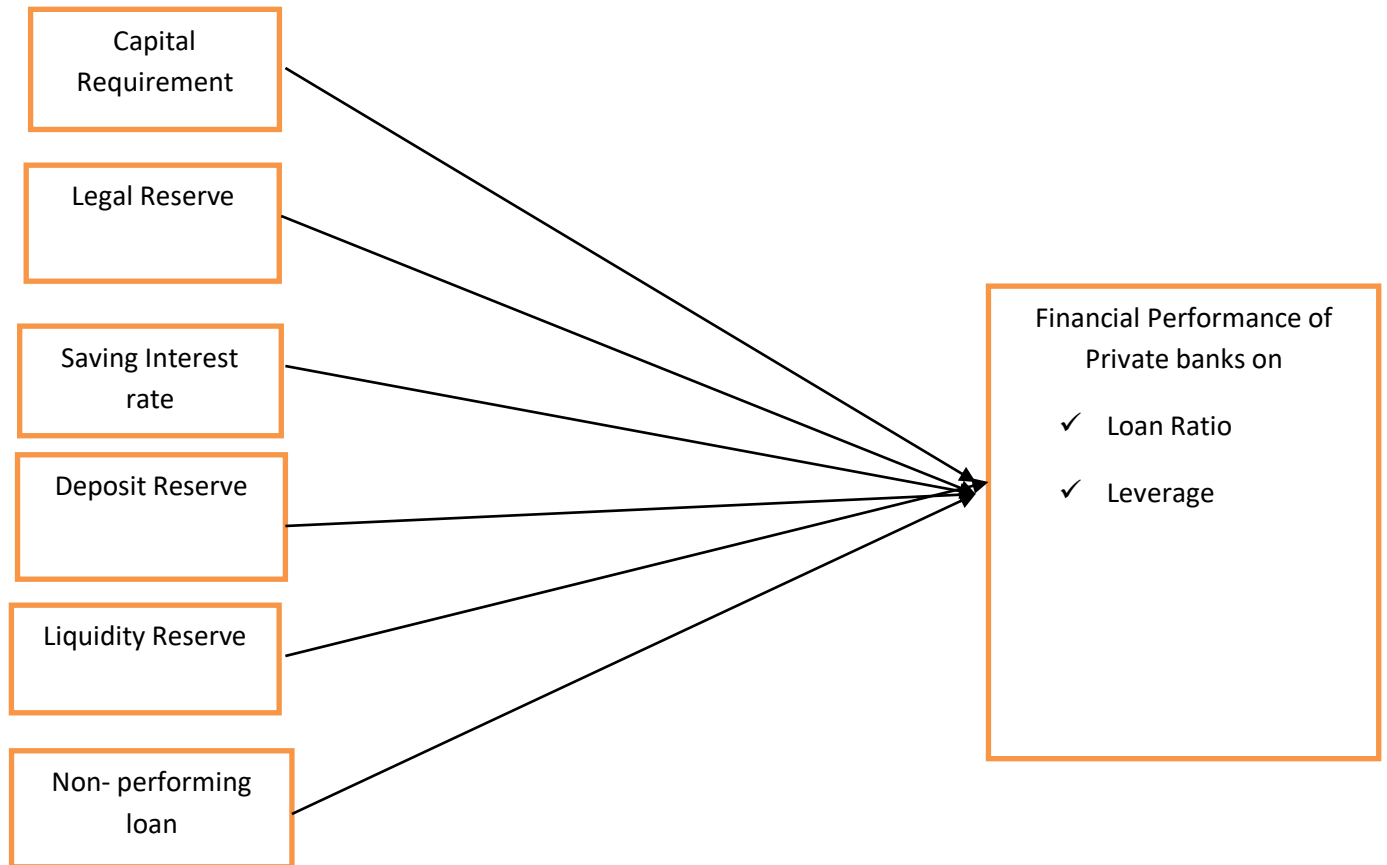
particularly harmful to bank development in countries with closed political systems. Barth et al., (2004) summarize various reasons for which this can have a negative influence on bank performance. For example, politicians may use powerful supervisors to persuade banks to lend to favored borrowers on advantageous terms. Furthermore, politicians and supervisors may use their power to benefit certain constituents, attract campaign donations, and extract bribes (Djankov et al., 2002). Obviously, when banks are forced under the threat of a non-compliant discipline to direct their credit to politically connected firms, they cannot use risk-return criteria (Beck et al., 2006). In addition, Levine (2003) mentions that powerful banks may, under the political/regulatory capture theory, confine politicians and induce supervisors to act in the interest of banks rather than the interest of the society (Stigler, 1971).

2.2 Conclusions on the literature review and knowledge gaps

As per the theoretical and empirical review of literatures there are different rules and regulations which are imposed on banks activity and of course the regulations which exist in one country is not similar with that of the others even though there are international regulations in which all of the banks in every country should obey, each and every country have their own regulations which is issued by the central bank for the purpose of controlling the economic activity of the countries. In Ethiopia there is no any empirical study which is conducted in this area by incorporating capital requirement, deposit reserve, saving interest rate, non-performing loan, liquidity reserve and legal reserve therefore this study is conducted to fill this knowledge gap by examining the effect of National bank regulation on private Commercial banks performance in Ethiopia.

2.3 Conceptual Framework

To achieve the research objective and to test the research questions, this study used the conceptual.



Framework developed by Mihret and Yismaw, (2007).

CHAPTER THREE: RESEARCH METHODOLOGY

Introduction

The purpose of this chapter is introducing research methodology that has been employed by the researcher. It outlines source of data and methods of data collection, sampling technique and method of data analysis and interpretation

3.1 Research Design

Descriptive Research Design were used, in which quantitative data were collected and analyzed in order to describe the specific phenomena in its current trends, current events and linkages between different factors at the current time. Explanatory research type was assisted to examine the relationship between bank regulation and financial performance of commercial banks in Ethiopia.

3.2 Population of the Study

The study populations are all private commercial banks in Ethiopia. There are sixteen private commercial banks in Ethiopia that are; Dashen Bank S.C, Awash International Bank S.C, Wegagen Bank S.C , United Bank S.C , Nib International Bank S.C ,Bank of Abyssinia S.C , Lion International Bank S.C , Cooperative Bank of Oromia S.C, Berehan International Bank S.C , Buna International Bank S.C , Oromia International Bank S.C , Zemen Bank S.C , Addis International Bank S.C , Abay Bank S.C (AB), Enat Bank S.C and Debub Global Bank S.C.

3.3 Method of Data Collection

In this research, secondary source of data has used to study the relationship between bank regulation and financial performance of private commercial banks in Ethiopia. Since the study was employed explanatory research approach, banks annual financial report, and audit report were collected from sample banks and different directives collected form National bank of Ethiopia.

3.4 Sample and Sampling Techniques

The total populations of the private commercial banks in Ethiopia are sixteen but for the study purpose the researcher has used sample of six private banks in Ethiopia. These banks were

selected due to their year of establishment. The study covered a period of 20 years from 1999 – 2018 and included all the private commercial banks with 20 and above establishment year. As NBE (2018/19) the sample of private commercial banks with 20 and above establishment year are Awash International bank S.C (AIB), Bank of Abyssinia S.C (BOA), Dashen Bank S.C (DB), Nib International Bank S.C (NIB), United Bank S.C (UB), and Wegagen Bank S.C (WB). For the study purpose the researcher has used purposive sampling technique because of the researcher complete freedom on collecting data and in order to gather relevant information on banks regulation that stated on national bank of Ethiopia and meet study objective. Therefore, the matrix for the frame will be 20*6 that includes 120 observations.

3.5 Data Analysis and interpretation

The nature of data has been used in this research enabled to use panel data model which considers having advantages over cross sectional and time series data. The study covered a period of 20 years from 1999-2018/19 and included private commercial banks with 20 and above establishment year. Data collected from different sources were analyzed using STATA software package.

Model specification

The following models are formulated for this research in order to test the research. To achieve the research objective and to test the research questions, this study used the model developed by Mihret and Yismaw, (2007); George et al (2015).

$$LQ_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LeR_{it} + \beta_3 SIR_{it} + \beta_4 DR_{it} + \beta_5 LiR_{it} + \beta_6 NPL_{it} + \varepsilon$$

$$LR_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LeR_{it} + \beta_3 SIR_{it} + \beta_4 DR_{it} + \beta_5 LiR_{it} + \beta_6 NPL_{it} + \varepsilon$$

Where:- **LR**= Loan Ratio , **L**=Leverage, $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \varepsilon$ =represent estimated coefficient for specific bank , **CR** = Capital Requirement, **LeR** = Legal Reserve , **SIR** = Saving Interest Rate, **DR** = Deposit Reserve, **LiR** = Liquidity Reserve and **NPL**=Non-Performing Loan

Table 1: Table summery of definitions, measurement and hypothesis of variables

Variable Code	Definition	Formula	Expected Sign
Dependent variable			
L	Leverage	$LQ_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LeR_{it} + \beta_3 SIR_{it} + \beta_4 DR_{it} + \beta_5 LiR_{it} + \beta_6 NPL_{it} + \epsilon$	
LR	Loan Ration	$LR_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LeR_{it} + \beta_3 SIR_{it} + \beta_4 DR_{it} + \beta_5 LiR_{it} + \beta_6 NPL_{it} + \epsilon$	
Independent variable			
CR	Capital Requirement		+
LeR	Legal reserve		+
SIR	Saving Interest Rate		+
DR	Deposit Reserve		+
LiR	Liquidity Reserve		+
NPL	Non-Performing Loan		+

Chapter Four: Data Presentation and Analysis

The preceding two chapters deal with literatures related to the topic and research methodology. In this chapter, detail analyses about the descriptive statistics and regression result have been made. Specifically, this chapter has included five sections. The first section presented descriptive

analysis of the dependent and independent variables using graphs and tables to provide an insight on the distribution of the data by bank and across time. The second section presented the correlation analysis result of dependent and independent variables. Section three presented the classical linear regression model assumptions diagnostic test results. The fourth section presented the results of the regression analysis and finally discussion of the regression results were presented under section five.

4.1. Descriptive Analysis

This section presents the summary of data used in the regression model and provides statistical descriptive analysis of the dependent and independent variables. The descriptive analysis is important in providing an insight about the distribution of the data by bank and across time as well as their averages.

4.1.1 Descriptive Analysis of Dependent Variables

The dependent variable of the study is the effect of Bank Regulation on Financial Performance private commercial banks in Ethiopia. As described in the literature part, the two most widely used approaches to measure liquidity of banks are liquidity gap approach (flow approach) and liquidity ratio approach (stock approach). Though both approaches are intuitively applying, the flow approach is more data intensive and there is no standard technique to forecast liquidity inflows and outflows. As a result, the stock approaches are more popular in practice and in the academic literature due to the availability of a more standardized method. The most popular stock ratios which are used in this study are liquid asset-to deposits and short term borrowing ratio, liquid asset-to-total asset ratio and total loans and advances-to-deposit and short term borrowing ratio.

Table-1: Descriptive Statistics for the dependent Variables

	Leverage	Loan Ratio
Mean	0.454000	0.664000
Median	0.425000	0.630000
Maximum	0.740000	0.920000
Minimum	0.300000	0.410000
Std. Dev.	0.118353	0.138900
Skewness	0.616747	0.243294
Kurtosis	2.395311	1.988624
Jarque-Bera	9.435775	6.298244
Probability	0.008934	0.042890
Sum	54.48000	79.68000
Sum Sq. Dev.	1.666880	2.295880
Observations	120	120

Source: Financial statement of sampled commercial banks and own computation through E-views 2020

$$\text{Leverage } (L = \frac{\text{Total Debt}}{\text{Total Asset}})$$

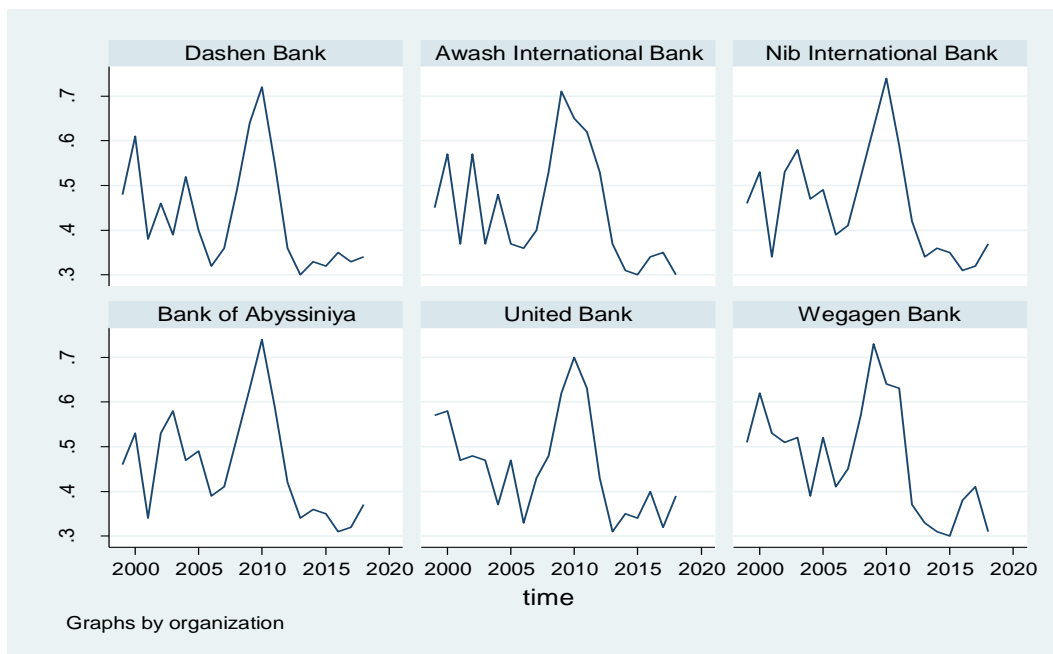
One of the liquidity measures of this study is liquid Total Debt-to- Total Asset ratio. The National Bank of Ethiopia also uses this ratio as the measurement of banks liquidity level and the liquidity requirement directive is based on this ratio. As per NBE directive number SBB/57/2014 issued by the National Bank of Ethiopia, any licensed commercial banks are required to maintain liquid asset of not less than fifteen percent (15%) of its net current liabilities (which includes the sum of demand deposits, saving deposits, time deposits and similar liabilities with less than one-month maturity).

As shown in figure 4.1.1 below, the overall average Leverage the studied banks was 45%. The standard deviation of 11% shows moderate dispersion from its mean. Accordingly both are by far above the minimum liquidity requirement standard of the supervisory authority which is currently 15%. In general, the higher this ratio signifies that the bank has the capacity to absorb liquidity shock and the lower this ratio indicates the bank's increased sensitivity related to deposit withdrawals.

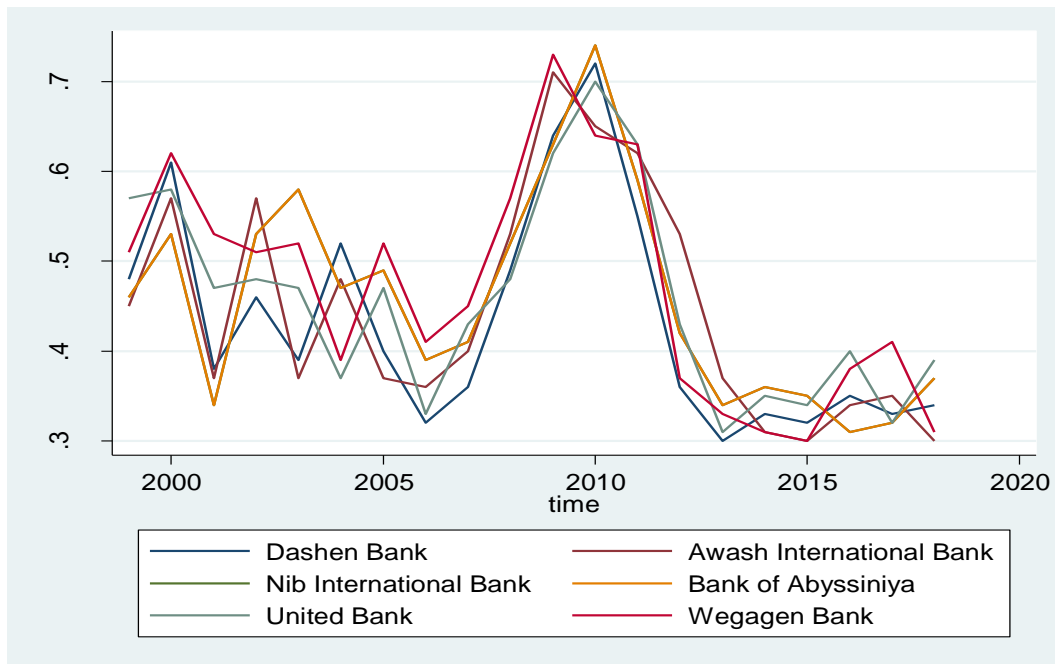
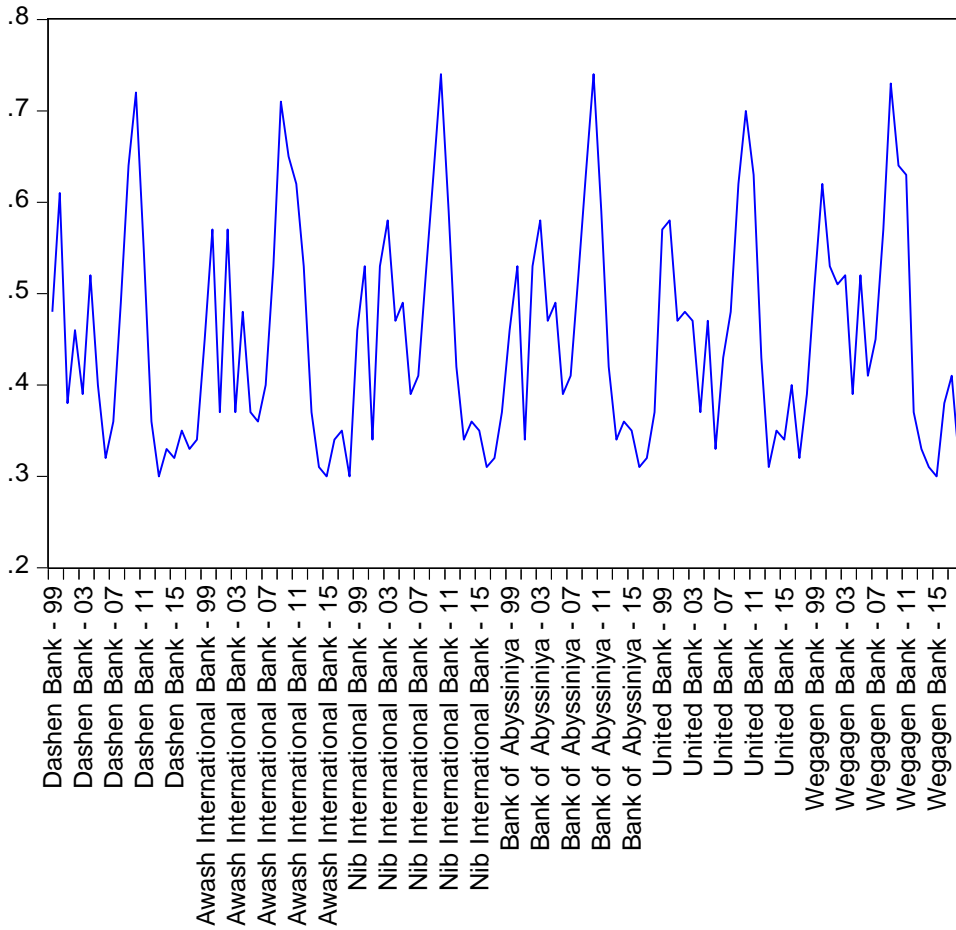
As indicated in table 1, the mean of Leverage within the period of this study is 0.45, while the median is 0.44. The amount of Leverage highest was in 2010, while the year with the lowest was 2015. As revealed by the skewness of Leverage, it has a positive skewness of 0.38. This indicates

that the degree of departure from the mean of the distribution is positive. The implication is that, on the whole, there is a consistent increase from 2005 to 2010. The kurtosis is 2.4. Since this is less than 3, the normal/standard value, the implication is that the degree of peakedness within the period under study is normally distributed since as most of the values cluster around the mean. The standard deviation of 0.11 was shows that its values are widely dispersed around the mean.

Figure -4.1: Total Debt-to- Total Asset ratio



L



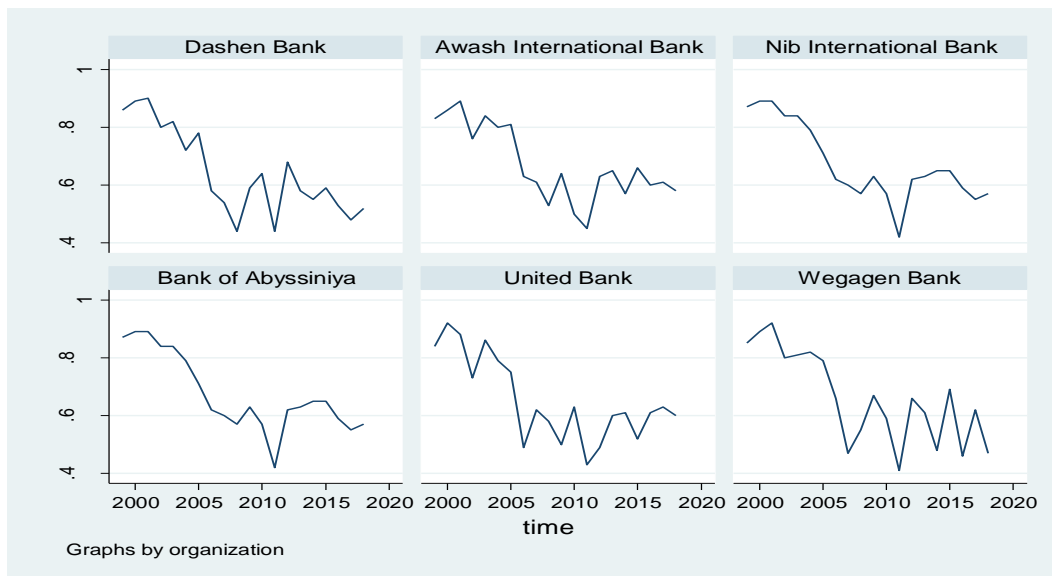
Source: Financial statement of sampled commercial banks and own computation through E-views 2020

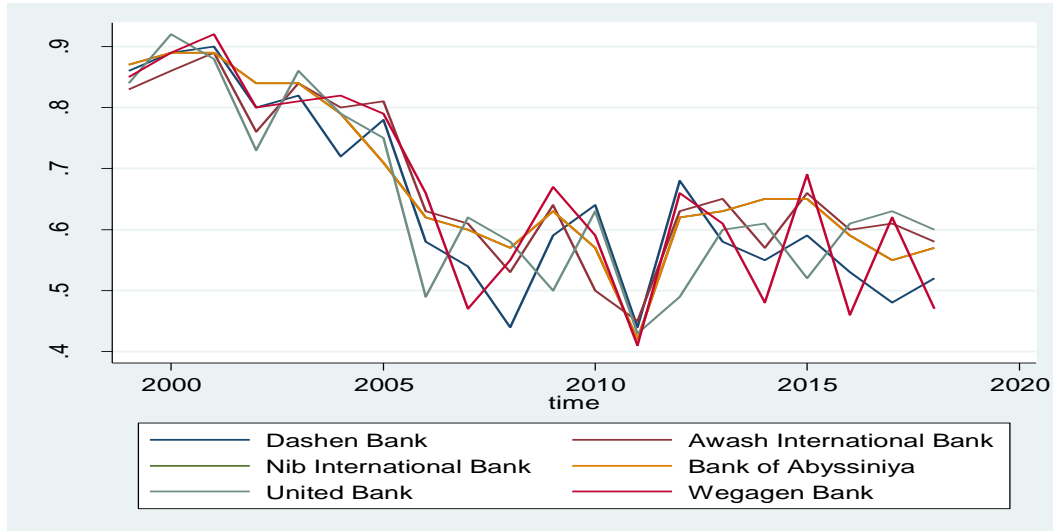
The above graph shows “(strongly balanced)” refers to the fact that all banks have data for all years. If, for example, one bank does not have data for one year then the data is unbalanced. Ideally you would want to have a balanced dataset but this is not always the case, however you can still run the model. debt ratio is high for 2010 is high do to political reason, the EPDRF has huge loan.

$$\text{Loan Ratio } (L = \frac{\text{Total Loan}}{\text{Total Deposit}})$$

The other measure of bank liquidity is liquid Total Loan -to- Total Deposit ratio which gives information about the long-term liquidity shock absorption capacity of a bank. As a general rule, the higher the share of liquid assets in total assets, the higher the capacity to absorb liquidity shock, given that market liquidity is the same for all banks in the sample. This measure of liquidity was taken as benchmark measure.

Figure 4. 2: Average liquid asset to total asset ratio





Source: Financial statement of sampled commercial banks and own computation through E-views 2020

The above graph shows “(strongly balanced)” refers to the fact that all banks have data for all years. If, for example, one bank does not have data for one year then the data is unbalanced. Ideally you would want to have a balanced dataset but this is not always the case, however you can still run the model.

The above two ratio’s leverage and loan ratio shows that, the liquidity of banks shows an increasing trends since 2006 up to 2010 and a decreasing trends in the year 2011 onwards after NBE has issued directive No MFA/NBEBILLS/001/2011 which requires all private commercial banks to purchase NBE bills based on their fresh loan disbursement.

As indicated in table 1, the mean of Loan Ratio within the period of this study is 0.66, while the median is 0.63. The amount of Loan Ratio highest was in 2010, while the year with the lowest was 2015. As revealed by the skewness Loan Ratio, it has a positive skewness of 0.24. This indicates that the degree of departure from the mean of the distribution is positive. The implication is that, on the whole, there is a consistent increase in from 2005 to 2010. The kurtosis is 2. Since this is greater than 3, the normal/standard value, the implication is that the degree of peakedness within the period under study is normally distributed since as most of the values

cluster around the mean. The standard deviation of 0.14 was shows that its values are widely dispersed around the mean.

4.1.2 Descriptive Analysis of Independent Variables

The independent variables used in this study includes: Capital Requirement, Legal Reserve, Saving Interest Rate, non-performing loans, Deposit Reserve and Liquidity Reserve discussed here under. The descriptive analyses of each independent variable are discussed here below.

Table-2: Descriptive Statistics for the independent Variables

	CR	DR	LER	LIR	NPL	SIR
Mean	2.45E+08	1.893000	15.70533	0.344500	0.075133	0.044333
Median	75000000	1.640000	13.22500	0.340000	0.060000	0.040000
Maximum	5.00E+08	3.990000	52.03000	0.520000	0.043000	0.070000
Minimum	75000000	0.360000	2.040000	0.180000	0.010000	0.030000
Std. Dev.	2.09E+08	1.147077	10.80160	0.080866	0.064975	0.012684
Skewness	0.408248	0.390460	1.851743	0.507493	2.107485	0.534745
Kurtosis	1.166667	1.828306	6.069529	3.279939	10.03557	2.310604
Jarque-Bera	20.13889	9.913519	115.6891	5.542815	336.3260	8.095371
Probability	0.000042	0.007036	0.000000	0.062574	0.000000	0.017463
Sum	2.94E+10	227.1600	1884.640	41.34000	9.016000	5.320000
Sum Sq. Dev.	5.20E+18	156.5785	13884.26	0.778170	0.502384	0.019147
Observations	120	120	120	120	120	120

Source: Financial statement of sampled commercial banks and own computation through E-views 2020

From the results displayed above, the analysis of the means shows the following descriptive statistics: **CR** (M= 2.45E+08, SD= 2.09E+08), **DR** (M= 1.893000, SD= 1.147077), **LER** (M= 15.70533, SD= 10.96864), **NPL** (M= 0.075133, SD= 0.064975), **LIR** (M= 0.344500, SD= 0.064975), **SIR** (M= 0.044333, SD= 0.012684). Hence, **LER** has the highest means (M= 15.70533) with the deviation from the mean of 10.80160. On the other hand, the lowest standard deviation for profitability (0.012684) indicates that all the data's are clustered around the mean and thus more reliable.

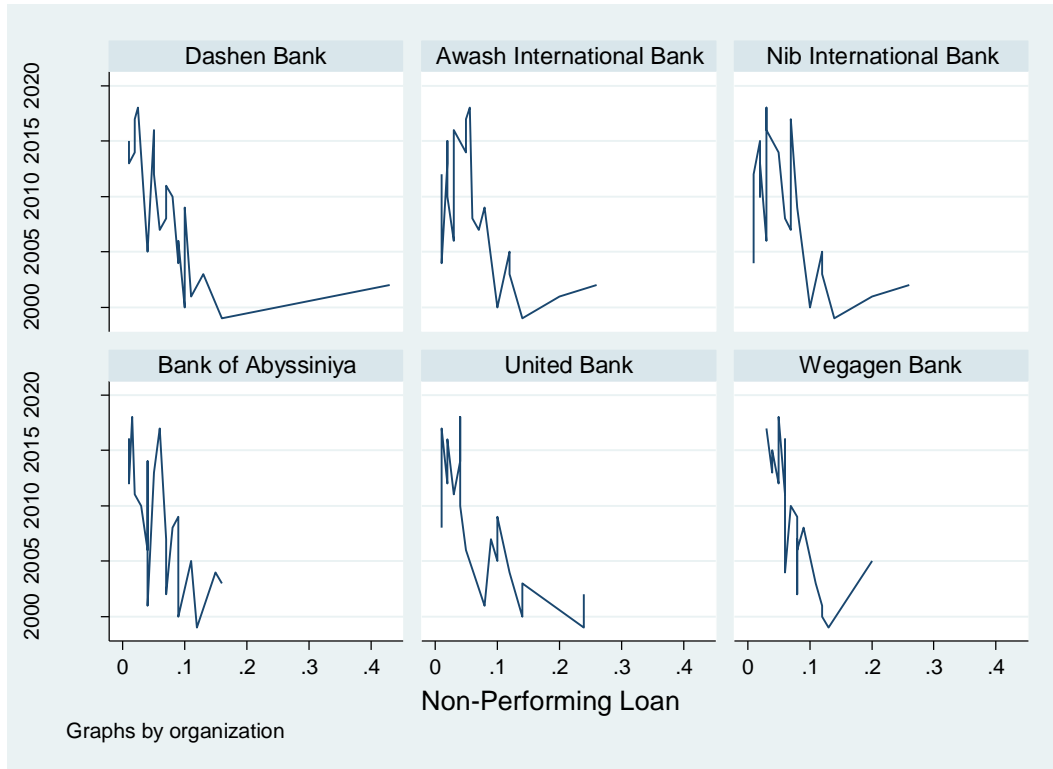
4.1.2.1. Non-Performing Loans (NPL)

As it is defined by NBE, non-performing loan means loans & advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment term of the loan or advance is in question. In this study, NPL is measured

by the share of non-performing loans from the total loans & advances of the bank. The National Bank of Ethiopia has provided direction to all commercial banks to maintain the NPL ratio below 5%.

Figure 4.2.4 below shows that, the average NPL ratio of the studied banks was 8% during the last twenty years. The maximum NPL ratio of 19% was recorded in the year 2002 and the minimum NPL ratio of 2.5% was recorded in the year 2012. As it is shown in the figure, the average NPL ratio has shown consistent decrement from 2002 up to the year 2006. The result indicates that the asset quality of the studied private commercial banks has shown improvement from 2010 onwards with average NPL ratio of below 5%. On the other hand, the standard deviation of 4% reveals there is little dispersion on NPL ratio from its mean.

Figure 4. 3: Average NPL Ratio



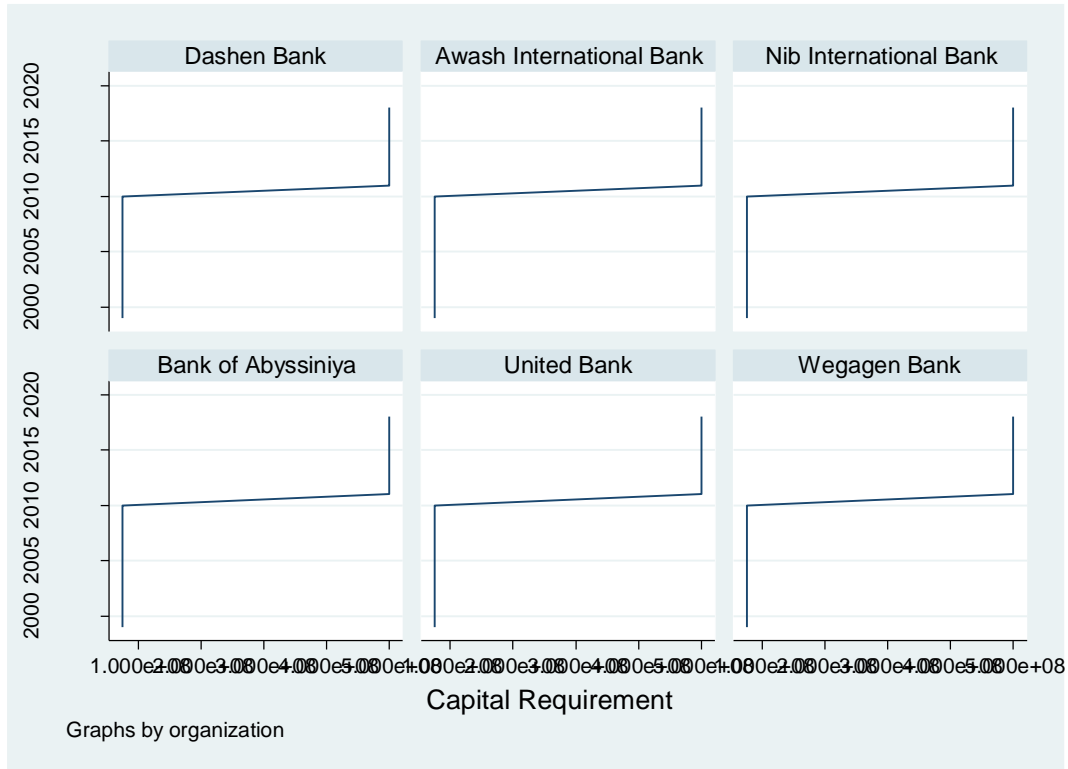
Source: Financial statement of sampled commercial banks and own computation through E-views 2020

For NPL, the mean is 0.075, while its median is 0.06. NPL was highest in 2002 and lowest in 2012. It has a positive skewness of 2.107485, implying that the degree of departure from the mean of the distribution is positive. However, its kurtosis is 10.03557, a figure above the normally level of 3.

This implies that the degree of peakedness within the period of this study is not normally distributed as most of its values are moving away from the mean. Its standard deviation of 0.064975 shows that its values are extremely widely dispersed.

4.1.2.2 Capital requirement

Figure 4. 4: Average Capital requirement



Source: Financial statement of sampled commercial banks and own computation through E-views 2020

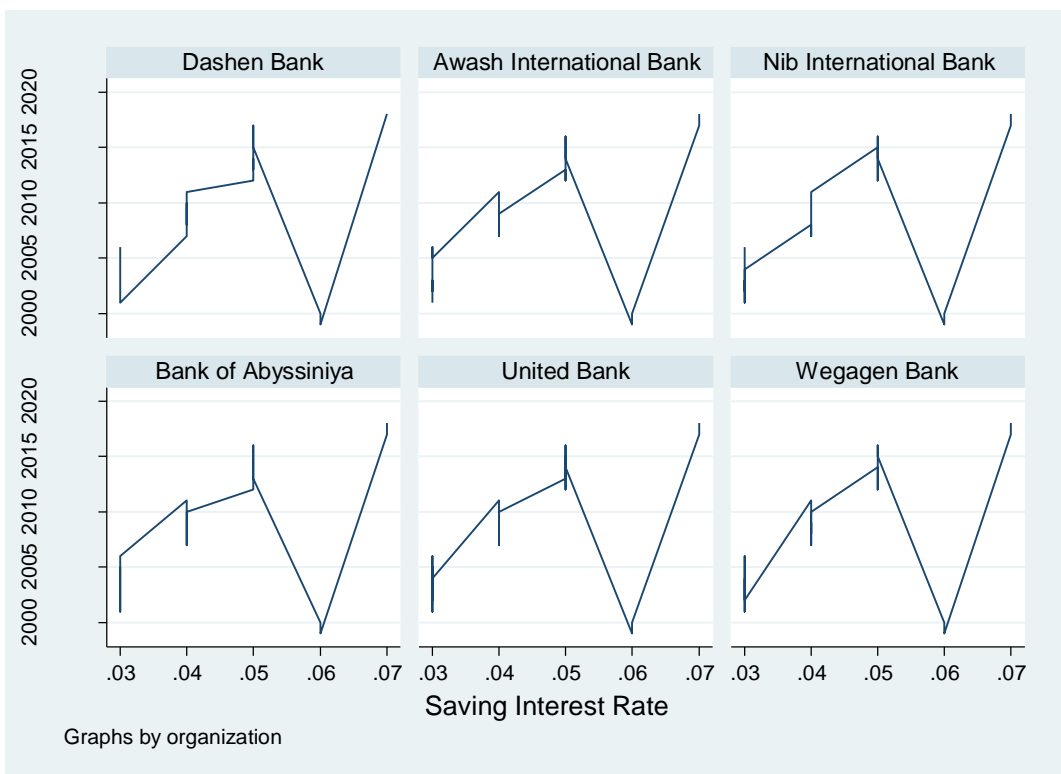
For CR, the mean is 2.45E+08, while its median is 75,000,000. CR was highest in 2011 and constant till 2011 and lowest in 1999 and constant till 2010 when its values were 500,000,000 and 75,000,000 respectively. It has a positive skewness of 0.408248, implying that the degree of departure from the mean of the distribution is positive. However, its kurtosis is 1.17, a figure below the normally level of 3. This implies that the degree of peakedness within the period of this study is not normally distributed as most of its values are moving away from the mean. Its standard deviation of 2.09E+08 shows that its values are extremely widely dispersed.

4.1.2.3. Saving Interest Rate (SIR)

Short term interest rate is the rate paid on money market instruments that have less than one year maturity. The most popular money market instrument (securities) in Ethiopia is Treasury bills. Treasury bills are the most important since they provide the basis for all other domestic

short term interest rates. The higher short term interest rate induces banks to invest more in the short term instruments and enhance their liquidity position. In this study the proxy for short term interest rate is the annual weighted average interest rate of Treasury Bills. As it is shown in figure 4.2.6 below, the average short term interest rate has declining from 2000 and reach the minimum rate in the year 2006 which was almost zero. From 2007 onwards the average short term interest rate has shown upward movement up to the year 2013 and there was slight downward movement in the year 2014 & 2015. The maximum short term interest rate was recorded in the year 2000 (i.e. 3.3%) followed by the year 2001 which was 2.8%. The standard deviation of 0.013 refers there was very little dispersion towards its mean value.

Figure 4. 5: Average **Saving Interest Rate (SIR)**

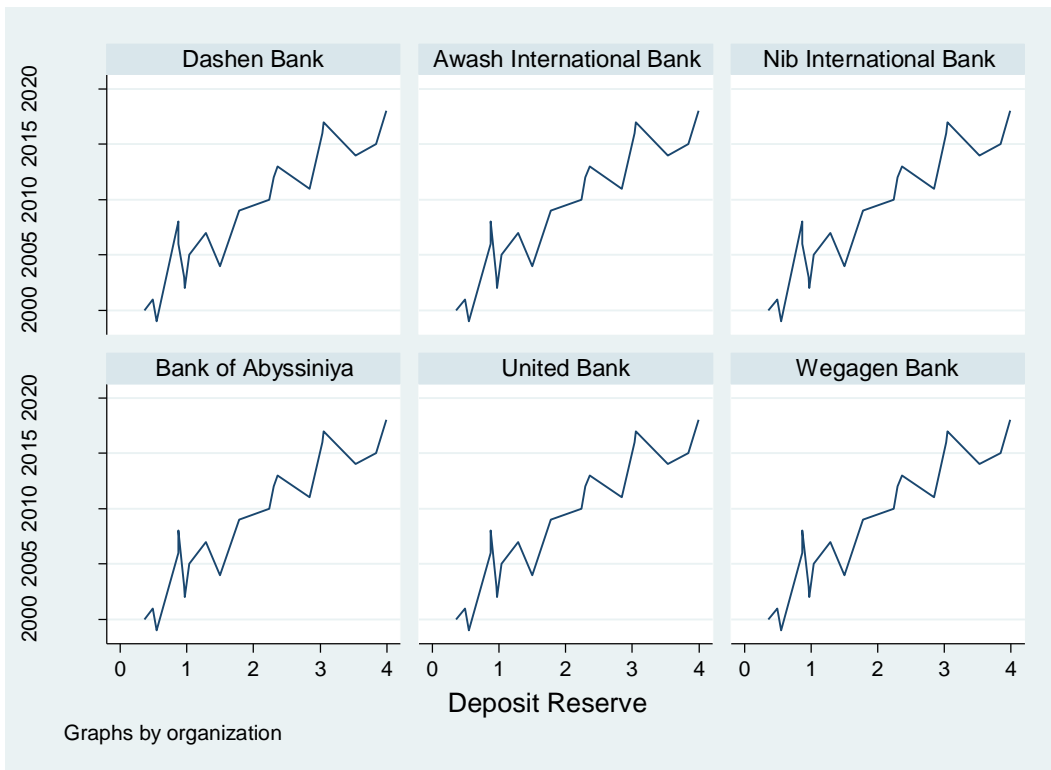


Source: Financial statement of sampled commercial banks and own computation through E-views 2020
 In the case of **SIR**, its mean within the period is 0.044333 while its median is 0.040000. **SIR** was highest in 2018 when the value was 0.07. It had a positive skewness of 0.534745. This shows that the degree of departure from the mean of the distribution is positive and consequently that there is a consistent increase of **SIR** from 2006 to 2018.

The kurtosis of 2.31 shows that the degree of peakedness within the period of this study is normally distributed around the mean. Its standard deviation of 0.012684 shows that its values are moderately distributed around the mean value.

4.1.2.4. Deposit reserve (DR)

Figure 4. 6: Average **Deposit reserve (DR)**

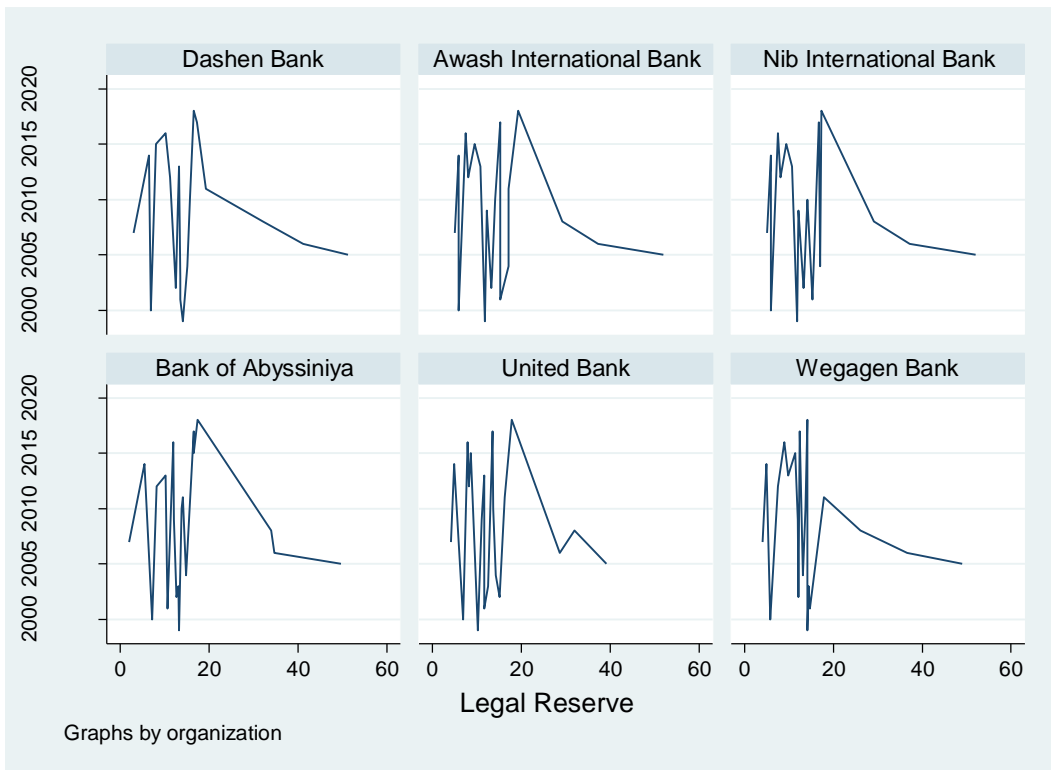


Source: Financial statement of sampled commercial banks and own computation through E-views 2020

For Deposit reserve, the mean is 1.9, while its median is 1.64. **Deposit reserve** was highest in 2018 and lowest in 2000 when its values were 3.99 and 0.36 respectively. It has a positive skewness of 0.39, implying that the degree of departure from the mean of the distribution is positive. However, its kurtosis is 1.83, a figure below the normally level of 3. This implies that the degree of peakedness within the period of this study is not normally distributed as most of its values are moving away from the mean. It's standard deviation of 1.17 shows that its values are extremely widely dispersed.

4.1.2.5. Legal reserve (LR)

Figure 4. 7: Average Legal reserve (LR)

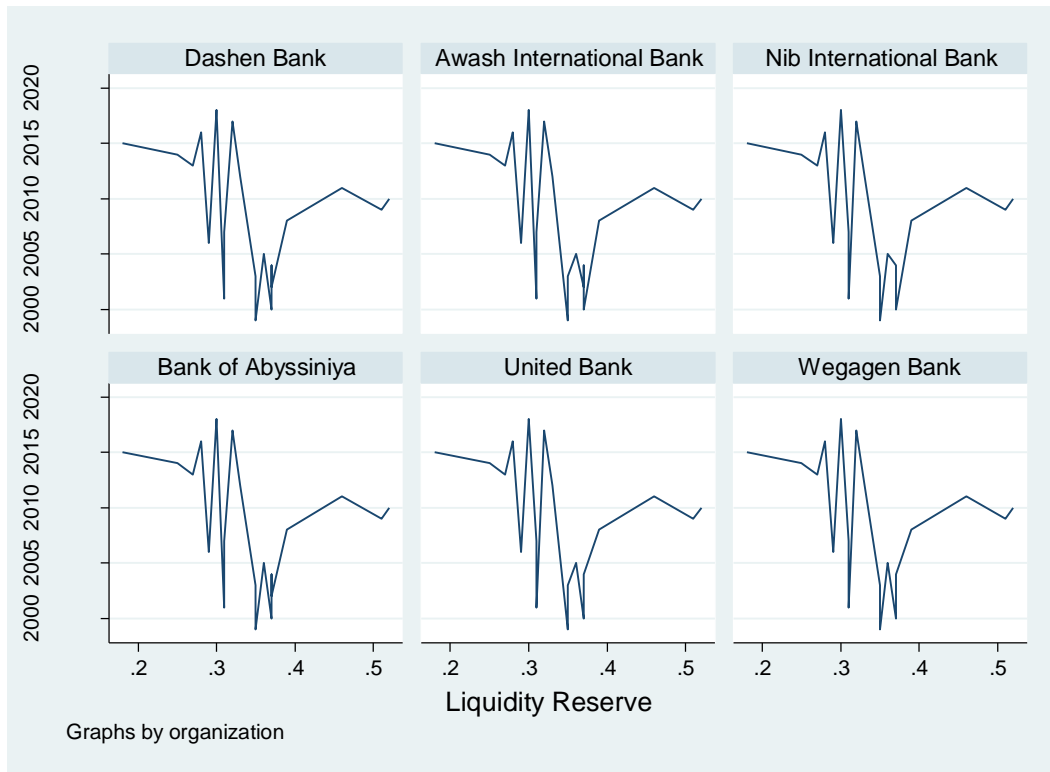


Source: Financial statement of sampled commercial banks and own computation through E-views 2020

In the case of **Legal reserve**, its mean within the period is 15.90550 while its median is 13.48000. Legal reserve was highest in 2015 when the value was 49.25. It had a positive skewness of 1.83. This shows that the degree of departure from the mean of the distribution is positive and consequently that there is a consistent decrease of Legal reserve from 2007 to 2017. The kurtosis of 5.81 shows that the degree of peakedness within the period of this study is normally distributed around the mean. Its standard deviation of 1.18 shows that its values are moderately distributed around the mean value.

4.1.2.6. Liquidity Reserve (LiR)

Figure 4. 8: Liquidity Reserve (LiR)



In the case of **Liquidity Reserve (LiR)**, its mean within the period is 0.3445 while its median is .340000. SIR was highest in 2018 when the value was 0.07. It had a positive skewness of 0.507493. This shows that the degree of departure from the mean of the distribution is positive and consequently that there is a consistent increase of SIR from 2006 to 2018. The kurtosis of 3.279939 shows that the degree of peakedness within the period of this study is normally distributed around the mean. Its standard deviation of 0.081 shows that its values are moderately distributed around the mean value

4.2. Diagnostic tests

4.2.1. Testing for time-fixed effects

Carrying out to see if time fixed effects are needed when running a FE model use the command `testparm`. It is a joint test to see if the dummies for all years are equal to 0, if they are then no time fixed effects are needed (type `help testparm` for more details) After running the fixed effect model, type: `testparm i.year` as follows:

Table 3: Testing for time-fixed effects for Leverage

```

Fixed-effects (within) regression              Number of obs   =       120
Group variable: Org                          Number of groups =         6

R-sq:  within = 0.8777                        Obs per group: min =        20
        between = 0.1366                       avg =              20.0
        overall = 0.8688                       max =              20

corr(u_i, Xb) = 0.0011                        F(22,92)        =       30.01
                                                Prob > F         =       0.0000
    
```

L	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
CR	-1.26e-09	3.34e-10	-3.76	0.000	-1.92e-09 -5.94e-10
LER	-.0006385	.0024151	-0.26	0.792	-.0054351 .004158
SIR	-.6521205	2.645985	-0.25	0.806	-5.907275 4.603034
DR	.1168465	.0353629	3.30	0.001	.0466128 .1870803
LIR	0	(omitted)			
NPL	-.0047643	.113358	-0.04	0.967	-.229903 .2203745
Yr					
2000	.1030654	.0331867	3.11	0.003	.0371538 .1689771
2001	-.0953991	.0854611	-1.12	0.267	-.2651322 .074334
2002	-.0429358	.0722475	-0.59	0.554	-.1864256 .100554
2003	-.0703846	.0708477	-0.99	0.323	-.2110943 .070325
2004	-.1675854	.054712	-3.06	0.003	-.2762481 -.0589227
2005	-.0855102	.1070816	-0.80	0.427	-.2981834 .1271631
2006	-.164195	.0898793	-1.83	0.071	-.3427031 .014313
2007	-.1837608	.0449199	-4.09	0.000	-.2729757 -.094546
2008	-.0094719	.0638495	-0.15	0.882	-.1362825 .1173387
2009	.0142821	.0287197	0.50	0.620	-.0427577 .0713219
2010	0	(omitted)			
2011	.3697376	.1194134	3.10	0.003	.1325723 .6069028
2012	.2539409	.1143303	2.22	0.029	.0268712 .4810107
2013	.1584967	.1113506	1.42	0.158	-.0626553 .3796486
2014	.0233793	.0788945	0.30	0.768	-.133312 .1800706
2015	-.0197596	.0661586	-0.30	0.766	-.1511562 .1116371
2016	.0956324	.0908973	1.05	0.296	-.0848974 .2761623
2017	.1015307	.0493337	2.06	0.042	.0035497 .1995116
2018	0	(omitted)			
_cons	.5663347	.1576308	3.59	0.001	.2532664 .8794031
sigma_u	.01299138				
sigma_e	.04683194				
rho	.0714545	(fraction of variance due to u_i)			

```

F test that all u_i=0:      F(5, 92) =      1.40      Prob > F = 0.2314
    
```

The Prob>F is > 0.05, so we failed to reject the null that the coefficients for all years are jointly equal to zero, therefore no time fixed-effects are needed in this case.

Testing for random effects: Breusch-Pagan Lagrange multiplier (LM)

The LM test helps you decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test is that variances across entities is zero. This is, no significant difference across units (i.e. no panel effect). The command in Stata is `xttset0` type it right after running the random effects model.

Breusch and Pagan Lagrangian multiplier test for random effects

$L[Org,t] = Xb + u[Org] + e[Org,t]$

Estimated results:

	Var	sd = sqrt(Var)
L	.0140074	.1183528
e	.0031329	.0559719
u	0	0

Test: Var(u) = 0

chibar2(01) = 0.00
Prob > chibar2 = 1.0000

Here we failed to reject the null and conclude that random effects is not appropriate. This is, no evidence of significant differences across countries, therefore you can run a simple OLS regression.

Testing for cross-sectional dependence/contemporaneous correlation: using Breusch-Pagan LM test of independence

According to Baltagi, cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). This is not much of a problem in micro panels (few years and large number of cases). The null hypothesis in the B-P/LM test of independence is that residuals across entities are not correlated. The command to run this test is `xttest2` (run it after `xtreg, fe`):

Lagrange Multiplier Tests for Random Effects
 Null hypotheses: No effects
 Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided
 (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	2.140098 (0.1435)	23.33759 (0.0000)	25.47769 (0.0000)
Honda	-1.462907 --	4.830900 (0.0000)	2.381530 (0.0086)
King-Wu	-1.462907 --	4.830900 (0.0000)	0.903363 (0.1832)
Standardized Honda	-1.091604 --	6.499576 (0.0000)	-0.350774 --
Standardized King-Wu	-1.091604 --	6.499576 (0.0000)	-1.620283 --
Gourierieux, et al.*	--	--	23.33759 (< 0.01)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Source: Financial statement of sampled commercial banks and own computation through E-views 2020
 from the above table no cross-sectional dependence.

4.2.2. Testing for time-fixed effects loan ratio

Carrying out to see if time fixed effects are needed when running a FE model use the command testparm. It is a joint test to see if the dummies for all years are equal to 0, if they are then no time fixed effects are needed (type help testparm for more details) After running the fixed effect model, type: testparm i.year as follows:

Table 4: Testing for time-fixed effects for loan ratio

```

Fixed-effects (within) regression      Number of obs   =   120
Group variable: Org                   Number of groups =    6

R-sq:  within = 0.9149                 Obs per group: min =   20
      between = 0.7296                   avg =             20.0
      overall = 0.9109                   max =             20

corr(u_i, Xb) = 0.0122                 F(22,92)        =   44.98
                                           Prob > F         =   0.0000
  
```

LR	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
CR	-2.18e-11	3.28e-10	-0.07	0.947	-6.73e-10	6.30e-10
LER	.0033095	.0023684	1.40	0.166	-.0013943	.0080134
SIR	5.045994	2.594847	1.94	0.055	-.1075966	10.19958
DR	-.1048838	.0346795	-3.02	0.003	-.1737602	-.0360074
LIR	0 (omitted)					
NPL	-.0246887	.1111672	-0.22	0.825	-.2454763	.1960989
Yr						
2000	.0358686	.0325453	1.10	0.273	-.0287692	.1005063
2001	.1827474	.0838094	2.18	0.032	.0162946	.3492001
2002	.1368266	.0708512	1.93	0.057	-.0038901	.2775433
2003	.1726406	.0694784	2.48	0.015	.0346504	.3106308
2004	.1718334	.0536546	3.20	0.002	.0652707	.278396
2005	-.0132848	.1050121	-0.13	0.900	-.2218478	.1952782
2006	-.148184	.0881423	-1.68	0.096	-.3232421	.0268741
2007	-.0748217	.0440518	-1.70	0.093	-.1623124	.0126689
2008	-.2402743	.0626155	-3.84	0.000	-.3646341	-.1159145
2009	-.0134803	.0281646	-0.48	0.633	-.0694177	.0424571
2010	0 (omitted)					
2011	-.0923269	.1171055	-0.79	0.432	-.3249085	.1402548
2012	.0165643	.1121206	0.15	0.883	-.2061169	.2392456
2013	.014738	.1091986	0.13	0.893	-.2021399	.2316159
2014	.1242669	.0773697	1.61	0.112	-.0293961	.2779299
2015	.1813128	.06488	2.79	0.006	.0524556	.31017
2016	-.0385347	.0891406	0.43	0.667	-.1385061	.2155755
2017	-.0540427	.0483802	-1.12	0.267	-.15013	.0420446
2018	0 (omitted)					
_cons	.5721007	.1545843	3.70	0.000	.2650828	.8791185
sigma_u	.01024601					
sigma_e	.04592684					
rho	.04741132	(fraction of variance due to u_i)				

F test that all u_i=0: F(5, 92) = 0.94 Prob > F = 0.4611

The Prob>F is > 0.05, so we failed to reject the null that the coefficients for all years are jointly equal to zero, therefore no time fixed-effects are needed in this case.

Testing for random effects: Breusch-Pagan Lagrange multiplier (LM)

The LM test helps you decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test is that variances across entities is zero. This is, no significant difference across units (i.e. no panel effect). The command in Stata is `xttest0` type it right after running the random effects model.

Breusch and Pagan Lagrangian multiplier test for random effects

$$LR[Org, t] = Xb + u[Org] + e[Org, t]$$

Estimated results:

	Var	sd = sqrt(Var)
LR	.0192931	.1388996
e	.0085844	.0926522
u	0	0

Test: Var(u) = 0
 chibar2(01) = 0.00
 Prob > chibar2 = 1.0000

Here we failed to reject the null and conclude that a random effect is not appropriate. This is, no evidence of significant differences across countries, therefore you can run a simple OLS regression.

Testing for cross-sectional dependence/contemporaneous correlation: using Breusch-Pagan LM test of independence

According to Baltagi, cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). This is not much of a problem in micro panels (few years and large number of cases). The null hypothesis in the B-P/LM test of independence is that residuals across entities are not correlated. The command to run this test is `xttest2` (run it after `xtreg, fe`):

Lagrange Multiplier Tests for Random Effects

Null hypotheses: No effects

Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided

(all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	2.140098 (0.1435)	23.33759 (0.0000)	25.47769 (0.0000)
Honda	-1.462907 --	4.830900 (0.0000)	2.381530 (0.0086)
King-Wu	-1.462907 --	4.830900 (0.0000)	0.903363 (0.1832)
Standardized Honda	-1.091604 --	6.499576 (0.0000)	-0.350774 --
Standardized King-Wu	-1.091604	6.499576	-1.620283

	--	(0.0000)	--
Gourierioux, et al.*	--	--	23.33759 (< 0.01)

*Mixed chi-square asymptotic critical values:

1%	7.289
5%	4.321
10%	2.952

Source: Financial statement of sampled commercial banks and own computation through E-views 2020 from the above table no cross-sectional dependence.

4.2.3 Correlation Analysis

In this section, the correlation between the dependent variables and the independent variables have been presented and analyzed. According to Brooks (2008), correlation between two variables measures the degree of linear association between them. To find the association of the independent variables with dependent variables Pearson Product Moment of Correlation Coefficient 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) and a correlation coefficient of zero, indicates that there is no linear relationship between the two variables.

Leverage

Variable	VIF	1/VIF
CR	5.79	0.172629
DR	4.69	0.213361
SIR	1.62	0.616716
NPL	1.53	0.651646
LIR	1.34	0.746641
LER	1.19	0.837901
Mean VIF	2.69	

Loan Ration

Variable	VIF	1/VIF
CR	5.79	0.172629
DR	4.69	0.213361
SIR	1.62	0.616716
NPL	1.53	0.651646
LIR	1.34	0.746641
LER	1.19	0.837901
Mean VIF	2.69	

Since VIF Value > 7 or 10, no multicollinearity problem.

Table 5 Correlation matrix of the dependent and independent variables

	L	LR	CR	DATEID	DR	LER	LIR	NPL	ORG	SIR	YR
L	1										
LR	0.087	1									
CR	-0.5	-0.6	1								
DATEID	-0.4	-0.76	0.85	1							
DR	-0.4	-0.64	0.88	0.93	1						
LER	0.03	-0.02	-0.3	-0.142	-0.27	1					
LIR	0.87	-0.046	-0.46	-0.3	-0.314	0.123	1				
NPL	0.23	0.57	-0.55	-0.65	-0.57	0.073	0.18	1			
ORG	0.09	0.006	0	0	-2.5632e-17	-0.057	1.681e-18	-0.020	1		
SIR	-0.26	-0.204	0.58	0.5	0.511	-0.375	-0.26	-0.3	0.02	1	
YR	-0.4	-0.761	0.85	0.99	0.93	-0.14	-0.3	-0.647	0	0.5	1

Source: Financial statement of sampled commercial banks and own computation through E-views 2020

Table 5 above, shows the correlation coefficient between the dependent variables and independent variables. Among the bank specific variables Legal reserve , Liquidity Reserve and non-performing loans are positively correlated with Leverage with correlation coefficient of 0.03 , 0.87 and 0.23 respectively. While **CR**, SIR and DR are negatively correlated with Leverage with correlation coefficient of 0.5, 0.4 and 0.26 respectively Where as, all have negatively correlated with Loan ratio.

4.2. 3. Testing the Classical Linear Regression Model (CLRM) Assumptions

In this section, the researcher carried out relevant diagnostic testing to identify for any violation of the underlining assumption of the classical linear regression model (CLRM).

Five assumptions were made which ensures that the estimation technique, ordinary least squares (OLS), to have a number of desirable properties, and that hypothesis tests regarding the coefficient estimates could validly be conducted. Specifically, it was assumed that average values of the error-term is zero, the variance of the errors are constant (homoscedastic), the covariance between the error-terms are zero (no autocorrelation), the error-terms are normally distributed (normality) and explanatory variables are not correlated (absence of multicollinearity).

4.2.3.1. Testing for the Average value of the error-term is zero

The first CLRM assumption requires, the average value of the errors term should be zero. As per Brooks (2008), if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since the constant term was included in the regression equation, this assumption is expected to be not violated.

4.2.3.2. Testing for the variance of the error-term is constant

The second assumption of CLRM is that, the variance of the error-term is constant; this is known as the assumption of homoscedasticity. If the errors do not have a constant variance or if the residual of the regression have systematically changing variability over the sample, they are said to be heteroscedastic means the estimated parameter will not be BLUE because of the inefficient parameter. To test the homoscedasticity assumption the White's test was applied having the null hypothesis of heteroscedasticity. Both F-statistics and Chi-square (χ^2) tests statistics were applied to decide whether to reject the null hypothesis by comparing p-value with significant level. The following table shows E-views results for heteroscedasticity of the three dependent variables.

Table 6. Heteroskedasticity Test: white test results

Leverage

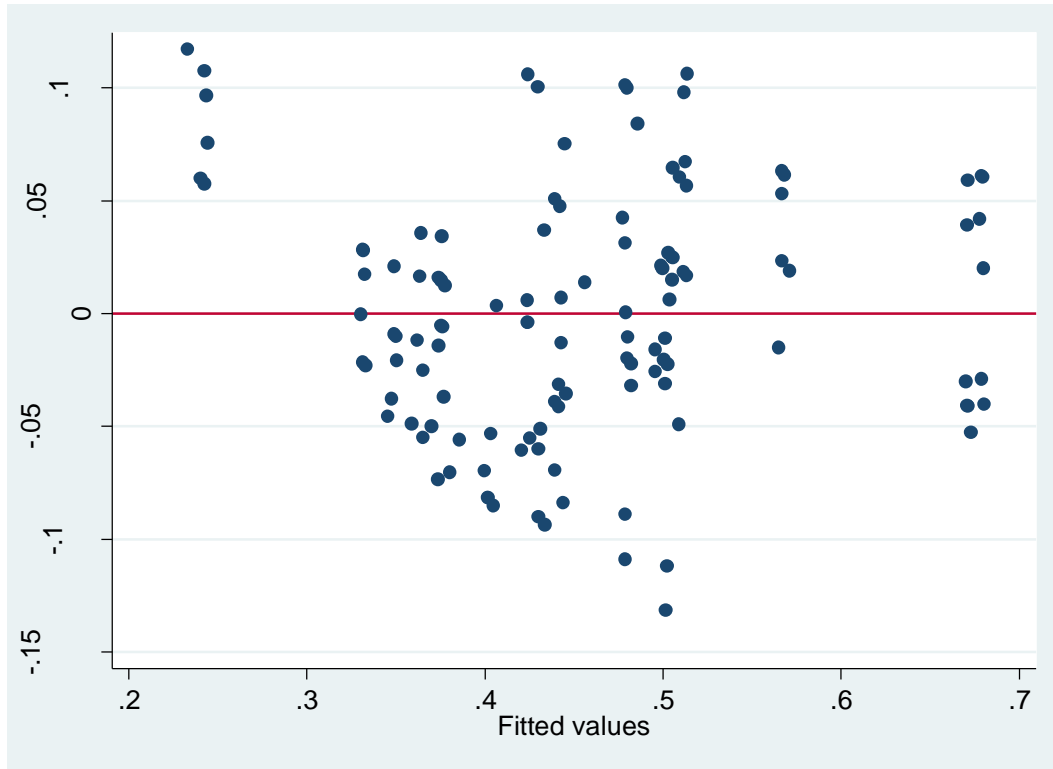
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of L

chi2(1) = 0.80

Prob > chi2 = 0.3719



Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	44.96	26	0.0119
Skewness	6.45	6	0.3752
Kurtosis	3.41	1	0.0648
Total	54.81	33	0.0099

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of L

chi2(1) = 0.80

Prob > chi2 = 0.3719

Loan ratio

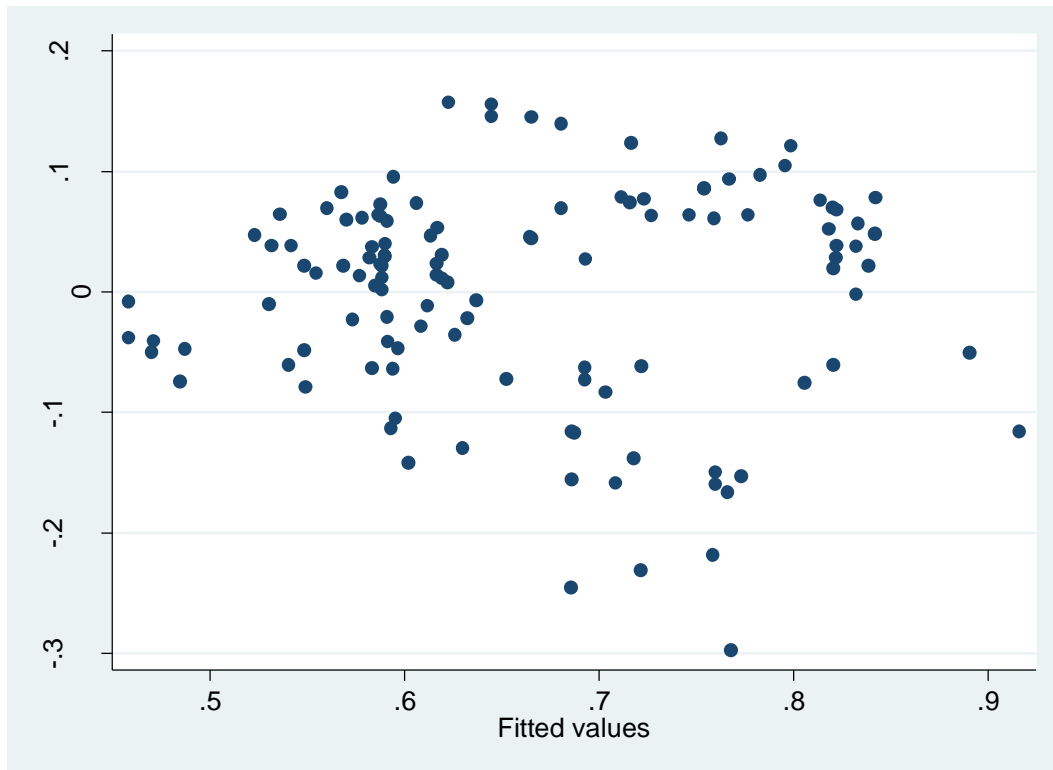
Breusch-Pagan / Cook-Weisberg test for Heteroskedasticity

Ho: Constant variance

Variables: fitted values of LR

chi2(1) = 8.74

Prob > chi2 = 0.0031



Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	63.89	26	0.0000
Skewness	20.12	6	0.0026
Kurtosis	0.85	1	0.3564
Total	84.85	33	0.0000

Ho: Constant variance
Variables: fitted values of LR
chi2(1) = 8.74
Prob > chi2 = 0.0031

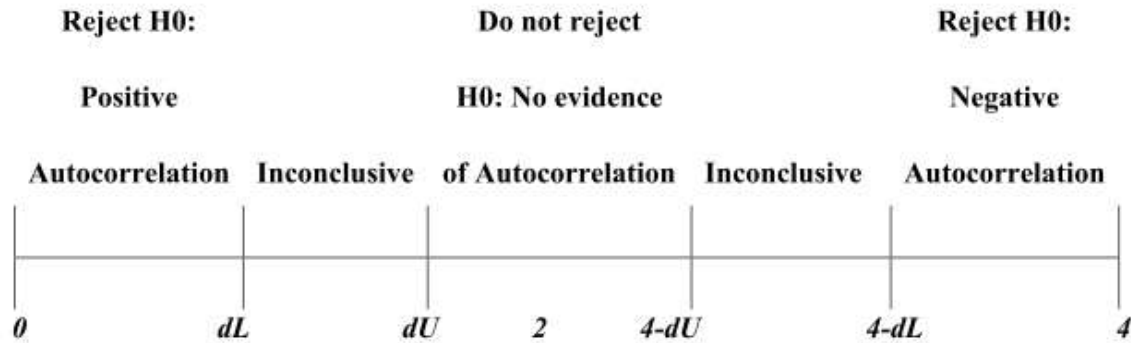
Source: Financial statement of sampled commercial banks and own computation through E-views 2020

The above table 6 indicates that, both the F-test- and χ^2 versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity for both leverage & loan ratio, since the p-values are considerably in excess of 0.05. The third version of the test statistic, scaled explained SS' also gives the same conclusion. In general, the entire regression model used in this study reveals that the variance of the error term is constant or homoscedastic. The test for heteroscedasticity was also conducted using the Breusch Pagan-Godfrey and Cameron & Trivedi's decomposition of IM-test tests which is based on the null hypothesis of no heteroscedasticity against the alternative of heteroscedasticity. The result shows that the model has a problem of heteroscedasticity as indicated by the p-value 0.000, as we fail to reject the alternative hypothesis at 1% level of significance. Thus, the study used the robust regression to overcome the problem.

4.2.3.3. Testing for the covariance between the error-terms are zero-(no autocorrelation)

Assumption three of the CLRM requires absence of autocorrelation or the covariance between the error terms is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are “auto correlated” or that they are “serially correlated”. The first step in testing whether the error series from an estimated model are auto correlated would be to plot the residuals and looking for any patterns. However, graphical methods are difficult to interpret in practice and hence a formal statistical test should also be applied. The simplest test is due to Durbin and Watson (1951). 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 ($u_t = \rho u_{t-1} + v_t$). DW is approximately equal to $2(1-p)$, where p is the estimated correlation coefficient between the error term and its first order lag (Brooks 2008). According to Brooks (2008), the DW test does not follow a standard statistical distribution such as a t, F, or χ^2 . DW has 2 critical values: an upper critical value (d_U) and a lower critical value (d_L), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 4.9 below

Figure 4.9: Rejection and non-rejection regions for DW test



The null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value (dL); the null hypothesis is rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value ($4-dL$); the null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper critical value (dU) and 4 minus the upper critical limits ($4-dU$) (Brooks 2008).

This study have ten explanatory variables (k) with ninety six observations and as per the DW table in Appendix-IV for 95 observations with ten explanatory variables at 1% level of significance, the dL and dU values are 1.313 and 1.767, respectively. Accordingly, the value of $4-dU$ and $4-dL$ are 2.233 and 2.687, respectively. The DW values of L1, L2 and L3 for 96 observations in this study are 1.806052, 1.781185 and 0.941291, respectively (Appendix-I). The DW value of L1 and L2 lies in the no evidence of autocorrelation region where the null hypothesis of no autocorrelation do not be rejected. Whereas, the DW value of L3 lies below the lower limit (dL) and indicate the presence of first order positive autocorrelation between the error term and its lag in which the null hypothesis of no autocorrelation should be rejected. Hence, in this study, the focus will be on the results of liquidity one (L1) and liquidity two (L2).

Table 6. Breusch-Godfrey Serial Correlation LM Test:

Leverage

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	6.720904	Prob. F(2,13)	0.0099
Obs*R-squared	10.09042	Prob. Chi-Square(2)	0.0064

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 06/26/20 Time: 16:47

Sample: 1999 2018

Included observations: 20

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR	-2.98E-10	3.01E-10	-0.989896	0.3403
DR	0.014943	0.041947	0.356247	0.7274
LR	-0.000238	0.002048	-0.116129	0.9093
SIR	1.205399	2.075329	0.580823	0.5713
NPL	-0.238826	0.597153	-0.399941	0.6957
RESID(-1)	0.743055	0.277493	2.677747	0.0190
RESID(-2)	0.125461	0.334657	0.374896	0.7138
R-squared	0.504521	Mean dependent var	0.010757	
Adjusted R-squared	0.275838	S.D. dependent var	0.124987	
S.E. of regression	0.106361	Akaike info criterion	-1.374730	
Sum squared resid	0.147066	Schwarz criterion	-1.026224	
Log likelihood	20.74730	Hannan-Quinn criter.	-1.306698	
Durbin-Watson stat	2.156961			

loan ratio

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.464425	Prob. F(2,13)	0.0190
Obs*R-squared	9.051627	Prob. Chi-Square(2)	0.0108

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 06/26/20 Time: 16:48

Sample: 1999 2018

Included observations: 20

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR	-1.33E-10	2.20E-10	-0.604968	0.5556
DR	0.005492	0.031755	0.172940	0.8654
LR	-0.000334	0.001552	-0.215247	0.8329
SIR	0.565311	1.568348	0.360450	0.7243
NPL	-0.073201	0.447040	-0.163747	0.8724
RESID(-1)	0.751514	0.287555	2.613466	0.0215
RESID(-2)	-0.002461	0.326968	-0.007528	0.9941

R-squared	0.452581	Mean dependent var	0.007703
Adjusted R-squared	0.199927	S.D. dependent var	0.090518
S.E. of regression	0.080966	Akaike info criterion	-1.920363
Sum squared resid	0.085221	Schwarz criterion	-1.571856
Log likelihood	26.20363	Hannan-Quinn criter.	-1.852331
Durbin-Watson stat	1.989860		

Source: Financial statement of sampled commercial banks and own computation through E-views 2020

4.2.3.4. Test for Normality

The fourth important diagnostic test conducted in this paper is the normality assumption. According to Brooks (2008), one of the most commonly applied test for normality is the Bera-Jarque (BJ) test. The entire distribution is characterized by the mean, variance, skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric to its mean value and kurtosis measures how fat the tails of the distribution are (Brooks, 2008). Thus a normal distribution is not skewed and is defined to have a coefficient of kurtosis of three

and a coefficient of excess kurtosis of zero. If the residuals are normally distributed, the histogram should be bell-shaped and BJ statistic would not be significant. The p-value of the normality test should be bigger than 0.05 to not reject the null of normality at 5% level.

Figure 4.10: Test for Normality

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Equation: Untitled

Periods included: 20

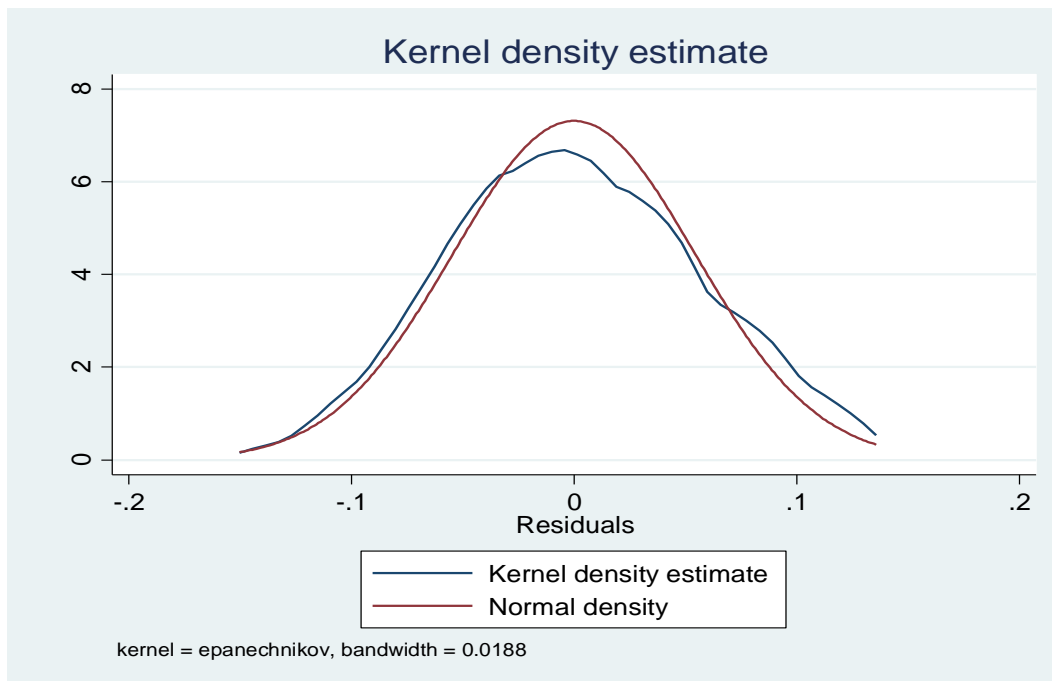
Cross-sections included: 6

Total panel observations: 120

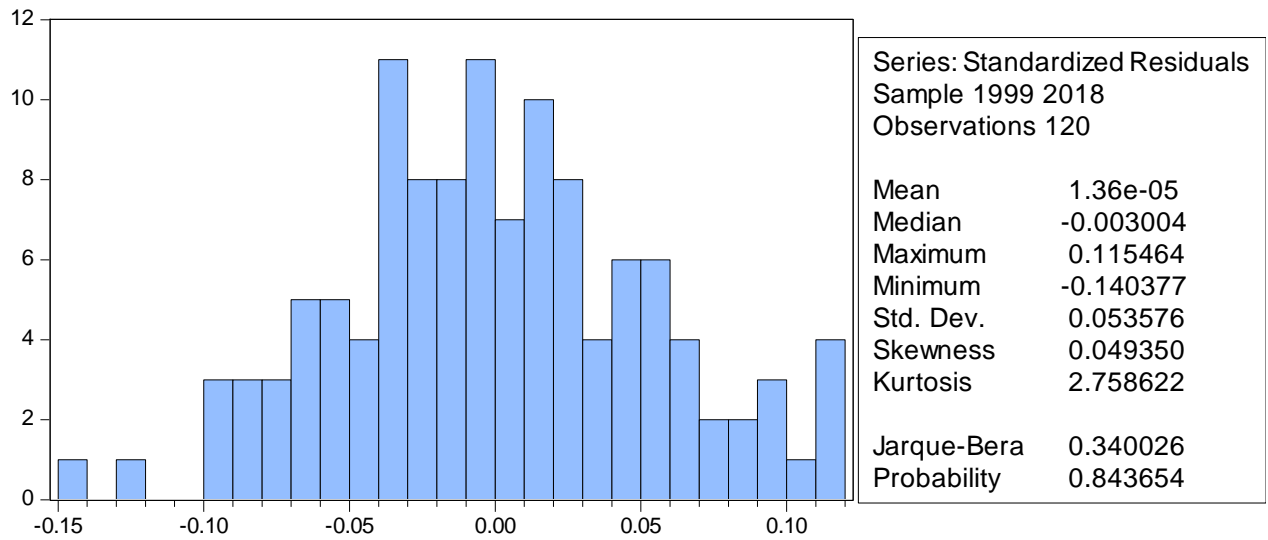
Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

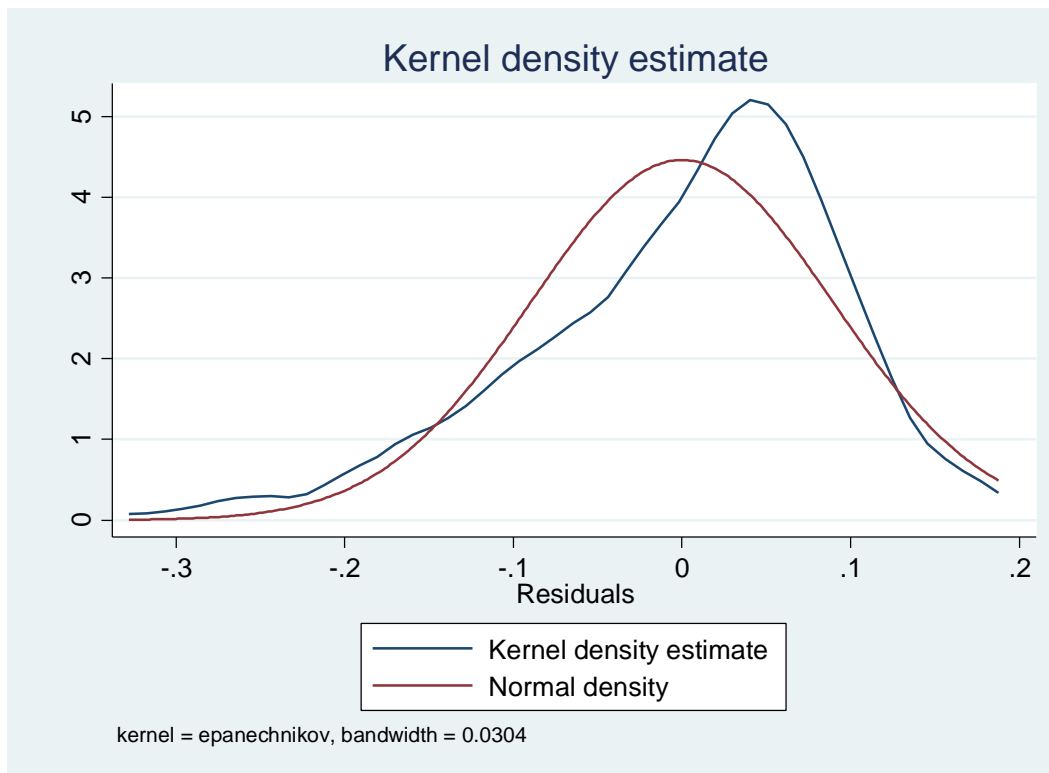
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	41.59882	15	0.0003
Pesaran scaled LM	3.760812		0.0002
Pesaran CD	5.013167		0.0000

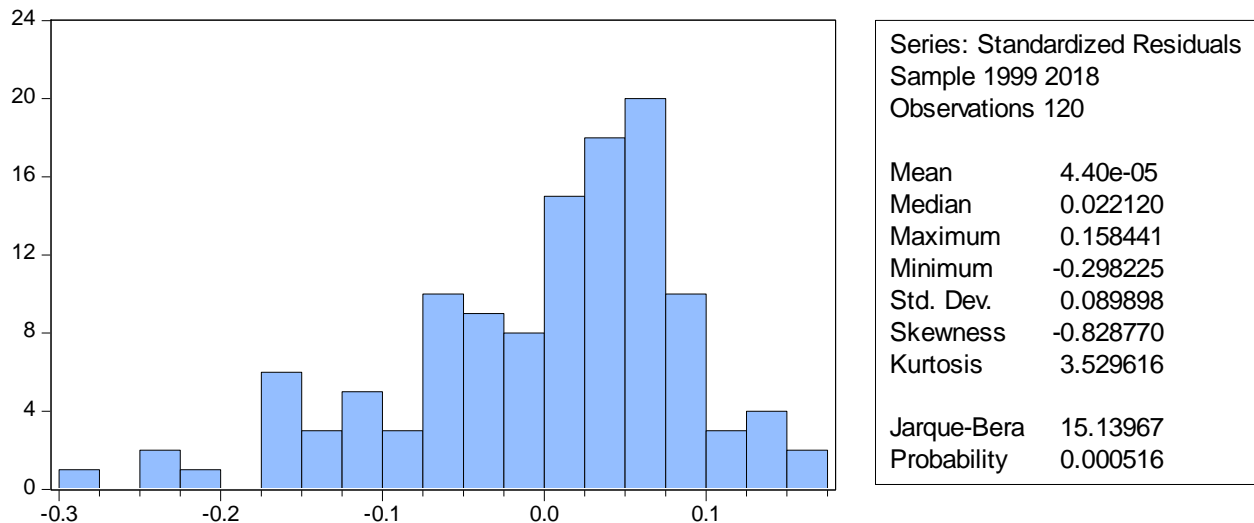


Leverage



Loan Ratio





Source: Financial statement of sampled commercial banks and own computation through E-views 2020

In this study, we used BJ normality test to test the null hypothesis of normally distributed assumption. As shown in the histogram kurtosis almost approaches to three which were 2.76, and 3.5 for Leverage and Loan Ratio respectively. On the other hand the p-value for the BJ test were 0.34, and 15.13 for leverage and Loan ratio respectively which is not significant even at 5% level of significant to reject the null hypothesis. Thus the result of the test implies that the data were consistent with a normal distribution assumption.

4.2.3.5. Test for Multicollinearity

The test for multicollinearity helps to identify the correlation between explanatory variables and to avoid double effects of the independent variables. It describes the relationship between explanatory variables. When the explanatory variables are highly correlated with each other, there exists multicollinearity problem (Brooks, 2008). Though, there is no consistent argument on the level of correlation that causes multicollinearity, Hair et al 2006(cited in Habtamu 2012) argues that correlation coefficient below 0.9 may not cause serious multicollinearity problems.

In this study correlation matrix for ten explanatory variables had been estimated. The results in the following correlation matrix show that the highest correlation of 0.88 existed between interest CR and DR followed by correlation coefficient of 0.76 which is existed between NPL and DR.

Table 7. Test for Multicollinearity

. corr
(obs=120)

	Org	Yr	L	LR	CR	LER	SIR	DR	LIR	NPL	yhat	r
Org	1.0000											
Yr	0.0000	1.0000										
L	0.0936	-0.3924	1.0000									
LR	0.0060	-0.7615	0.0867	1.0000								
CR	0.0000	0.8496	-0.4997	-0.5536	1.0000							
LER	-0.0570	-0.1422	0.0249	-0.0191	-0.2979	1.0000						
SIR	0.0193	0.4988	-0.2579	-0.2040	0.5818	-0.3752	1.0000					
DR	-0.0000	0.9297	-0.3635	-0.6423	0.8753	-0.2705	0.5110	1.0000				
LIR	-0.0000	-0.2870	0.8732	-0.0455	-0.4639	0.1235	-0.2617	-0.3148	1.0000			
NPL	-0.0203	-0.6475	0.2322	0.5668	-0.5496	0.0735	-0.2935	-0.5708	0.1813	1.0000		
yhat	0.0081	-0.8539	0.0725	0.7651	-0.7237	-0.0250	-0.2667	-0.8395	-0.0595	0.7408	1.0000	
r	-0.0003	-0.1680	0.0485	0.6439	0.0000	0.0000	-0.0000	0.0000	-0.0000	-0.0000	0.0000	1.0000

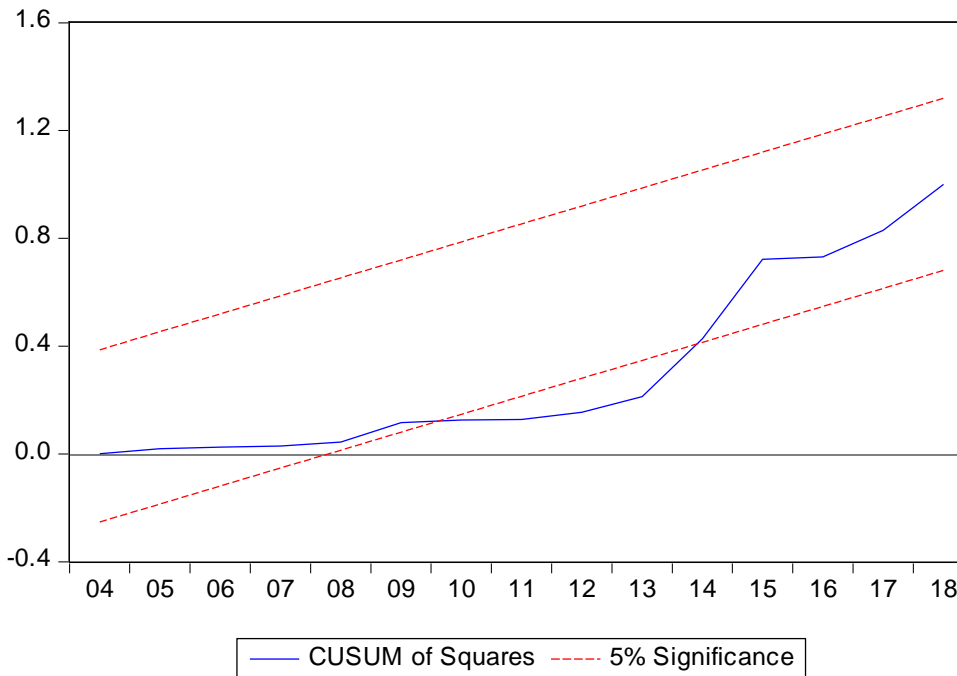
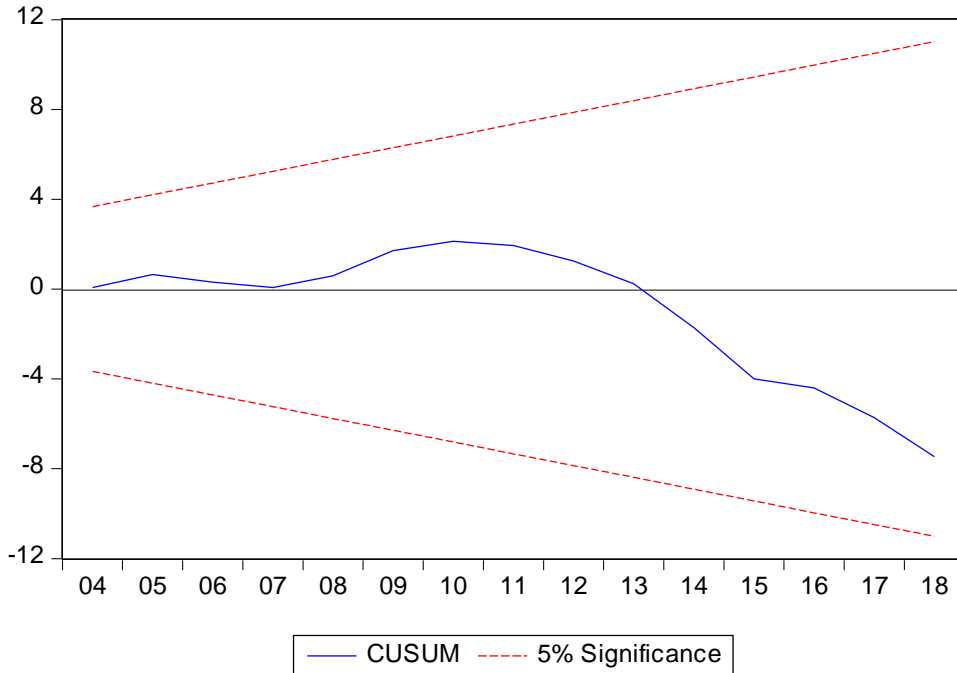
Source: Financial statement of sampled commercial banks and own computation through E-views 2020

4.2.3.6. Test of Model Stability

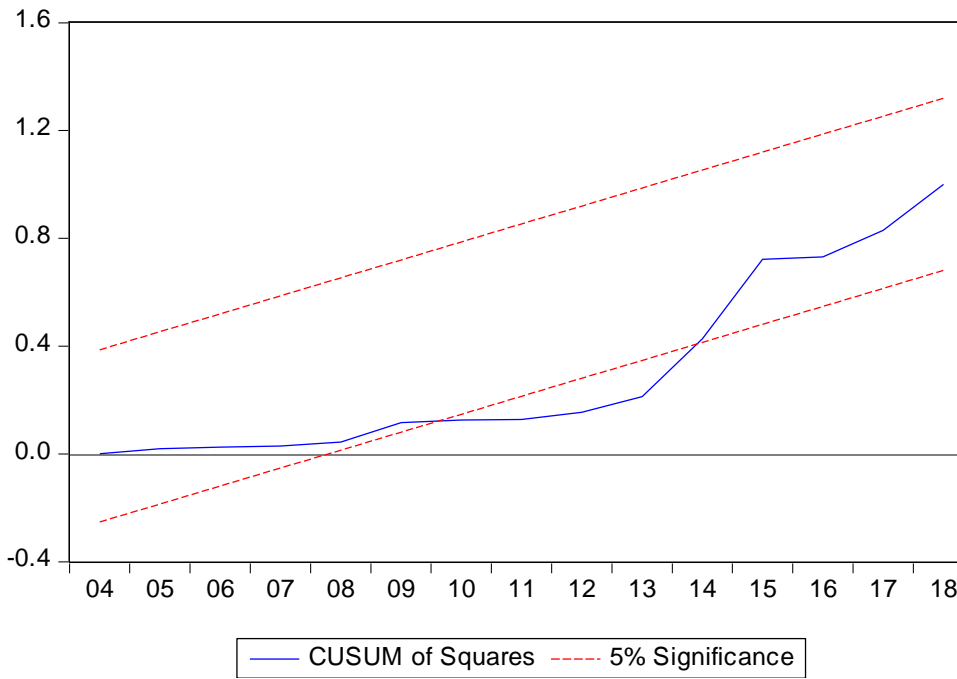
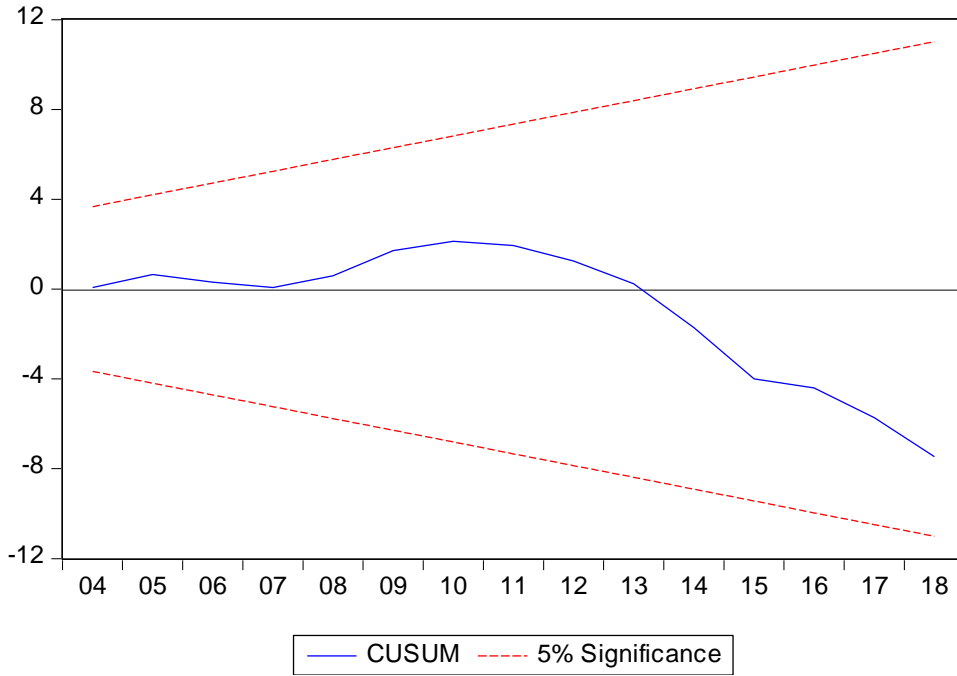
To check the verifiability of the estimated long run model, some diagnostic test is undertaken. Priority in doing any analysis, required to check the standard property of the model. This study carried a number of model stability and diagnostic checking, which includes Serial correlation test (Brush & Godfray LM test) and Heteroscedasticity test.

In addition to the above diagnostic tests, the stability of long run estimates has been tested by applying the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test. Such tests are recommended by Pesaran, (2001). Both (CUSUM) and (CUSUMSQ) test indicate the model is significant at 5% critical value.

Leverage



Loan Ratio



. linktest

Source	SS	df	MS	Number of obs = 120		
-----+-----				F(2, 117) = 236.30		
Model	1.33610777	2	.668053886	Prob > F	= 0.0000	
Residual	.330772227	117	.002827113	R-squared	= 0.8016	
-----+-----				Adj R-squared = 0.7982		
Total	1.66688	119	.014007395	Root MSE	= .05317	

L	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
_hat	.1448559	.3019827	0.48	0.632	-.4532049	.7429168
_hatsq	.9002169	.3141239	2.87	0.005	.2781111	1.522323
_cons	.1928373	.0706769	2.73	0.007	.0528654	.3328091

. ovtest

Ramsey RESET test using powers of the fitted values of L
Ho: model has no omitted variables
F(3, 110) = 13.54
Prob > F = 0.0000

There is weak evidence that there is a functional form misspecification in the model.

4.3. Results of Regression Analysis

This section discusses the regression results of fixed effect model that determines the liquidity of private commercial banks in Ethiopia. In this study, liquidity is measured by leverage & loan ratio .To decide between fixed or random effects you can run a Hausman test where the null hypothesis is that the preferred model is random effects vs. the alternative the fixed effects (see Green, 2008, chapter 9). It basically tests whether the unique errors (u_i) are correlated with the regressors, the null hypothesis is they are not. Run a fixed effects model and save the estimates, then run a random model and save the estimates, then perform the test. See below.

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fixed	random	Difference	S.E.
CR	-8.22e-11	-8.47e-11	2.45e-12	1.82e-12
LER	-.0012808	-.0013326	.0000518	.0000364
SIR	-.0035607	.0179556	-.0215163	.0165479
DR	-.0001907	-.0004586	.0002679	.0002885
LIR	1.195313	1.194678	.0006343	.0008293
NPL	.028386	.0162863	.0120997	.013322

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(5) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 3.30$$

$$\text{Prob} > \chi^2 = 0.6533$$

If this is < 0.05 (i.e. significant) use fixed effects.

4.3.1. Determinants of Bank Liquidity Measured by Leverage Model- 1

The empirical model used in this study to identify the statistically significant determinants of Ethiopian private commercial banks liquidity measured by leverage was: *Estimation Equation: Leverage = C(1)*CR + C(2)*DATEID + C(3)*DR + C(4)*LER + C(5)*LIR + C(6)*NPL + C(7)*ORG + C(8)*SIR. The following table presents the regression result of the determinants of commercial bank's liquidity measured by leverage.*

Dependent Variable: Leverage

Method: Panel Least Squares

Date: 07/21/20 Time: 04:25

Sample: 1999_2018

Periods included: 20

Cross-sections included: 6

Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR	-8.29E-11	5.83E-11	-1.422347	0.1577
DATEID	8.10E-08	5.65E-08	1.434461	0.1542
DR	-0.000393	0.009563	-0.041071	0.9673
LER**	-0.001269	0.000513	-2.470392	0.0150

LIR***	1.196055	0.072489	16.49984	0.0000
NPL	0.023880	0.096467	0.247549	0.8049
ORG**	0.006035	0.002959	2.039500	0.0438
SIR	0.013627	0.508452	0.026800	0.9787
<hr/>				
R-squared	0.795083	Mean dependent var	0.454000	
Adjusted R-squared	0.782276	S.D. dependent var	0.118353	
S.E. of regression	0.055225	Akaike info criterion	-2.890479	
Sum squared resid	0.341572	Schwarz criterion	-2.704647	
Log likelihood	181.4288	Hannan-Quinn criter.	-2.815012	
Durbin-Watson stat	2.064432			

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively

Source: Financial statement of sampled commercial banks and own computation through E-views 2020

Table 4.11 above shows the results of the regression analysis on the determinant of the dependent variable (liquidity) which was measured by leverage which includes both bank specific variables for the sample of six Ethiopian private commercial banks. The coefficient of determination in this model is given by R-squared of 0.79 and Adjusted R-squared of 0.78 which means 78 % of variation of Ethiopian private commercial bank's liquidity leverage can be explained by the variation on capital requirement, deposit reserve, Legal Reserve, non-performing loans, liquidity reserve and Saving Interest Rate. The remaining 22 % of changes was explained by other determinants which are not included in this model. Thus, the explanatory power of the model is high. The value of F-statistics is 12.222 with p-value of 0.000000 which is used to measure the overall significance of the model. Thus, the p-value of F-statistics is zero at six digits, the null hypothesis is rejected and the model is significant even at 1% significant level.

As it is shown on table 4.111 above Saving Interest Rate, legale reserve, liquidity reserve and non-performing loans (NPL) had statistically significant factors affecting liquidity of Ethiopian private commercial banks which is measured by Leverage. Both legale reserve and liquidity reserve statistically significant variables). The above table also depicts that, Capital Requirement had statistically significant influence on Ethiopian private commercial bank's leverage legale reserve, liquidity reserve at 10% significant level. The other statistically significant variables, non-performing loans (NPL) had statistically significant impact on

leverage) at 1% significant level. The other variables such as capital requirement, deposit reserve and Deposit Reserve statistically insignificant impact on leverage. On the other hand the coefficient sign capital requirement only was contrary to our expectations whereas the coefficient sign of deposit reserve, Legal Reserve, non-performing loans and Saving Interest Rate were in-line with our expectations.

Substituted Coefficients:

$$\text{Leverage} = -8.29e - 11 * CR + 8.10e - 08 * DATEID - 0.0004 * DR - 0.0013 * LER + 1.196 * LIR + 0.02 * NPL + 0.006 * ORG + 0.014 * SIR$$

4.3.2. Determinants of the Effect of Bank Regulation on Financial Performance Measured by loan ratio Model- 2

The empirical model used in this study to identify the statistically significant determinants of Ethiopian private commercial bank's liquidity measured by loan ratio was: Estimation Equation:

$$LR = C(1)*CR + C(2)*DATEID + C(3)*DR + C(4)*LER + C(5)*LIR + C(6)*NPL + C(7)*ORG + C(8)*SIR$$

The following table shows the regression result of the determinants of commercial bank's liquidity measured by loan ratio.

Table 4.12: Regression result of liquidity measured by L2

Dependent Variable: LR
 Method: Panel Least Squares
 Date: 07/21/20 Time: 08:51
 Sample: 1999_2018
 Periods included: 20
 Cross-sections included: 6
 Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR**	-1.83E-10	9.78E-11	-1.866089	0.0646
DATEID***	1.27E-06	9.48E-08	13.38488	0.0000
DR***	-0.057446	0.016046	-3.580047	0.0005
LER**	-0.002057	0.000862	-2.387067	0.0187
LIR***	-0.533243	0.121633	-4.384029	0.0000
NPL***	0.561786	0.161868	3.470644	0.0007
ORG	3.57E-05	0.004965	0.007200	0.9943
SIR	1.375386	0.853161	1.612107	0.1098
R-squared	0.581115	Mean dependent var		0.664000
Adjusted R-squared	0.554935	S.D. dependent var		0.138900
S.E. of regression	0.092664	Akaike info criterion		-1.855325
Sum squared resid	0.961709	Schwarz criterion		-1.669492
Log likelihood	119.3195	Hannan-Quinn criter.		-1.779858

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively

Source: Financial statement of sampled commercial banks and own computation through E-views 2020
As it can be seen from the above table saving interest rate and capital requirement were statistically significant at 10% significant level. The significant level of capital requirement had similar result with Leverage. Deposit reserve, legal reserve, liquidity reserve and non-performing loans (NPL) had statistically significant factors affecting liquidity of Ethiopian private commercial banks which is measured by Leverage at 1% significant level.

Thus, unless there are differences in the level of significant, those independent variables which had statistically significant impact in the determination of liquidity in the case of Leverage had also statistically significant impact on the determination of bank's liquidity of Ethiopian private commercial banks in the case of Loan ratio. The coefficient of determination in this model is given by R-squared of 0.58 and Adjusted R-squared of 0.55, which means 58% of variation of Ethiopian private commercial bank's loan ratio can be explained by the variation on capital requirement, deposit reserve, Legal Reserve, non-performing loans and Saving Interest Rate. The remaining 42% of changes was explained by other determinants which are not included in this model. Comparing with Leverage, the explanatory power of the independent variables on the dependent variable is slightly higher in the case of loan ratio. The value of F-statistics is 9.464 with p-value of 0.000000 which is used to measure the overall significance of the model. Thus, the p-value of F-statistics is zero at six digits, the null hypothesis is rejected and the model is significant even at 1% significant level.

As it is shown on table 4.12 above, among the independent variables deposit reserve, Legal Reserve, liquidity reserve, had negatively related with Loan ration whereas, non-performing loans and Saving Interest Rate had positively related with Loan ratio. Thus the overall result shows that, bank liquidity leverage decreases with higher loan growth and capital requirement while increases with higher non-performing loans. In this regard, only loan growth had coefficient sign which is in-line with our expectations while the coefficient sign of the other statistically significant variables are contrary to our expectations. The regression result shows that, statistically significant influence of non-performing loans which is measured by

Loan ration was consistent with the result found on the study made by Tseganesh(2012) and Malik et al(2013). Substituted Coefficients:

$$\text{Loan Ration} = 1.83e - 10 * CR + 1.27e - 06 * DATEID - 0.06 * DR - 0.002 * LER - 0.53 * LIR + 0.56 * NPL + 3.57e - 05 * ORG + 1.38 * SIR$$

4.4. Discussion of the Regression Results

In this section, the relationship between the dependent variable and each independent variable were discussed on the basis of the findings on this study. The dependent variable, liquidity of Ethiopian private commercial banks, were measured by:- leverage and loan ratio. And the independent variables were capital requirement , deposit reserve, Legal Reserve, non-performing loans, liquidity reserve and Saving interest Rate. Thus, the regression result of each bank specific variables were discussed in each the effect of Bank Regulation on Financial Performance.

Table 4.13: summary for Regression result of liquidity measured

Variable	Leverage	Loan ration
CR	0.1577	0.0646**
DR	0.9673	0.0005***
LER	0.0150**	0.0000***
NPL	0.8049	0.0007***
SIR	0.9787	0.1098
LIR	0.0000***	0.0000***
ORG	0.0438***	0.9943

***, **, and * denote significance at 1%, 5%, and 10% levels respectively

Source: Financial statement of sampled commercial banks and own computation through E-views 2020

for leverage liquidity reserve is significant at 1% ,banks and legal reserves at 5% while for loan ratio time, deposit reserve, liquidity reserve and non-performance loan are significant at 1%,leagal reserve at 5% ,capital requirement at 10%. Liquidity reserve is significant at 1% for both leverage and loan ratio.

Chapter Five: Conclusions and Recommendations

The preceding chapter presented the analysis of the findings, while this chapter deals with the major conclusions and recommendations based on the findings of the study. The chapter is organized in to two sub-sections, the first section presented the major conclusions of the Study and the second section deals with the recommendation drawn from the study.

5.1. Conclusions

The main objective of this study was to determine the relationship between regulation and financial performance of private commercial banks in Ethiopia. With the objectives of the study, six bank specific variables were used. The bank specific variables include capital requirement, deposit reserve, Legal Reserve, non-performing loans, liquidity and saving Interest Rate. The study was used panel data for the sample of six private commercial banks in Ethiopia which had 20 years of banking service over the period 1999 to 2018. The bank specific data were mainly collected from annual audited financial reports of the respective sample banks and the macroeconomic data were collected from NBE and MoFEC.

Data was presented and analyzed by using descriptive statistics, correlation analysis and balanced fixed effect regression analysis to identify the determinants of liquidity of Ethiopian private commercial banks which were measured by liquid asset to leverage and loan ratio.

While before performing the regression analysis, test for CLRM assumption were conducted and found a problem of first order positive autocorrelation in the case of leverage and loan ratio and CLRM assumption were satisfied.

The result of this study confirmed that, among the bank specific variables legal reserve and liquidity reserve had statistically significant impact on the determination liquidity of Ethiopian private commercial banks measured by leverage. Whereas capital requirement, deposit reserve and Legal Reserve had no statistically significant impact on the determination of liquidity of Ethiopian private commercial banks. But all independent variables statistically significant impact with Bank Regulation on Financial Performance.

The negative relationship between capital requirement and liquidity was opposite to our hypothesis but consistent with the “too big to fail” hypothesis. The coefficient sign for capital requirement revealed negative relationship with liquidity and it was in line with our hypothesis and the finance theory.

The result revealed a positive relationship between Bank Regulation on Financial Performance and liquidity reserve with strong statistical significant. This result was not in line with our expectation but this could be a sign of prudent policy of banks that, they offset the higher credit risk with better portfolio quality and caution liquidity risk management. It was also found that profitability and liquidity had positively related and it was inconsistent with our hypothesis but it was consistent with Bourke (1989) result.

5.2. Recommendations

This study was intended to determine the relationship between regulation and financial performance of private commercial banks in Ethiopia; and hence on the basis of the findings of the study, the following recommendations were drawn

- Ethiopian private commercial banks should have liquidity management policy to ensure that they are operating to satisfy their profitability target as well as the ability of meeting the financial demands of their customers by maintaining optimum level of liquidity;
- The negative relationship between capital requirement and liquidity revealed the “too big to fail” hypothesis, in which big banks may encourage to disburse more capital requirement. Thus, big banks needs to manage their liquidity position and shall give due attention on resource mobilization and liquidity management.
- As liquidity reserve has statistically significant and positive relation with liquidity, Ethiopian private commercial banks shall give priority so as to maintain the optimum level of loan growth as it affects both profitability and liquidity.
- In general, the findings of the study reveals that, bank specific variables have more statistically significant impact on the determination of liquidity of Ethiopian private commercial banks, since they are internal variables that can be controlled by management, special emphasis shall be given to those significant variables.

- Recommendation for further study: As this study identifies only limited bank specific variables for a sample of six private commercial banks in Ethiopia, there have to be further researches which include more bank specific variables, regulatory factors that affect the liquidity of Ethiopian commercial banks.

6. References

- Altunbas, Y., Gardener, E.P.M., Molyneux, P., and B. Moore, (2000), “Efficiency in European banking”, *European Economic Review*, 45, pp. 1931-1955.
- Barth, J.R. (2001). *Banking systems around the globe:*” Do regulations and ownership affect performance and stability”? *Journal of Banking and Finance*, Vol. 13 pp.147.
- Barth, L. R. (2001). “*The regulation and supervision of bank around the world*”: a new database. In: Litan, R.E., Herring, R., Integrating Emerging Market Countries into the Global Financial System, *Journal of Finance*, pp. 183-240.
- Barth, J. R. (2004). *Bank regulation and supervision: What works best?* *Journal of Financial Intermediation*, Vol. 13, pp. 205-248.
- Barth & Levine, R. (2006). *Rethinking Bank Regulation: Till Angels Govern*. Cambridge University Press, New York, NY.
- Barth, J.R., Gan, J., Nolle, D.E. (2004). *Global Banking Regulation and Supervision: ‘What are the Issues and What Are the Practices’?* In: Focus on Financial Institutions and Services, *Journal of Finance*.
- Barth & Levine, R. (2007). *Bank Regulations Are Changing: But for Better or Worse?* July, World Bank, available at: <http://go.worldbank.org/SNUSW978P0>.
- Barth & Levine, R. (2005). *Rethinking Bank Regulation*, Bank of England and Bank of Slovenia Conference on Small Countries, Big Markets Achieving.
- Berger, A.N&Udell.G. (1994), *Did Risk-Based Capital Allocate Bank Credit and Cause a “Credit Crunch” in the United States?* *Journal of money, Credit, and Banking*, Vol.26, pp. 585-628.
- Bernanke, B. (1983). *Non-Monetary Effects of the financial Crisis in the propagation of the Great Depression*, *American Economic Review*, Vol.73, pp. 257-263. 38
- Besanko, D., Kanatas, G., 1996. *The regulation of bank capital: ‘Do capital standards promote bank safety’?* *Journal of Financial Intermediation* Vol5, pp. 160-183.
- Ben-Khadhiri H., Casu, B., & Sheik-Rahim,F. (2005). *Profitability and interest rates differentials in Tunisian banking*, University of Wales Working Papers.
- Beck, T., Demirgüç-Kunt, A., Levine, R., 2000. *A New Database on Financial Development And Structure*. *World Bank Economic Review* Vol. 14, pp.597-605.
- Beck, T., Demirguc-Kunt, A., Levine, R., 2006. “*Bank supervision and corruption in lending*”. *Journal of Monetary Economics*, Vol.53, pp. 2131-2163.

Benston, G.J. & Smith, W. (1976). *A transaction costs approach to the theory of financial intermediation*. *Journal of Finance*, 31, No 2, 215-231

Berger, A.N., 1995. *The relationship between capital and earnings in banking*. *Journal of Money, Credit, and Banking*, Vol. 27, pp. 432-456.

Besanko, D., Kanatas, G. (1996). *The Regulation of Bank Capital: Do Capital Standards Promote Bank Safety?* *Journal of Financial Intermediation*, Vol 5, pp.160-183.

Berger, A.N., Klapper, L.F., Turk-Ariss, R.(2008). *Banking Structures and Financial Stability* Mimeo.

Blum, J., (1999). “*Do bank capital adequacy requirements reduce risks?*” *Journal of Banking And Finance*, Vol. 23, pp. 755-771.

Caprio, G., Laeven, L., Levine, R. (2007). *Governance and bank valuation*, *Journal of Financial Intermediation*, Vol. 16, pp.584-617.

Central bank of Rwanda Website: www.bnr.rw.

Christen, R., Lyman, T., & Rosenberg, R. (2003). *Microfinance consensus guidelines: Guiding Principles on regulation and suspension of microfinance*. Washington. CGPAP. pp. 57-71.

Coase, R.H. (1960). *The Problem of Social Cost*, *Journal of Law and Economics*. University of Chicago Press, 3, 1-44.

Dermiguc-Kunt, A., Huizinga, H.(2004). *Market discipline and deposit insurance*. *Journal of Monetary Economics* Vol.51, pp. 375-399. Diamond, D.V. & Dybvig, P. (1983). ‘*Bank Runs, Deposit Insurance, and Liquidity*’, *Journal of Political Economy*, Vol.91, pp 401-419.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2002. *The regulation of entry*. *Quart. J. Econ.* 117, 1–37.

Edwards, J.K. (1997). ‘*Ethical foundations of financial regulations*’, working paper, No.1620.

Fernandez, A.I. and Gonzalez, F. (2005). “*How Accounting and Auditing Systems Can Counteract Risk-Shifting of Safety-Nets in Banking: Some International Evidence*”, *Journal of Financial Stability*, Vol.1, pp. 466-500

Guidotti, P., Rojas-Suarez, L. & Zahler, R. (2004). *Designing financial regulatory policies that work for SACCOs*.

Gully, H. The GATS Agreement and Liberalizing the Kuwaiti Banking Sector, “ERF, 8th Annual Conference, Egypt.

Herring, R. (2005), "Implementing Basel II: Is the Game worth the Candle?" *Financial Markets, Institutions and Instruments*, 14, pp. 267-287.

.Hughes, J.P., Mester, L. and C. Moon, (2001), "Are Scale Economies in Banking Elusive or Illusiv. Evidence Obtained by Incorporating Capital Structure and Risk-Taking into models of Bank Production", *Journal of Banking and Finance*, Vol. 25, pp. 2169-2208. 40

Hulme,D. & Mosley , P. (1996). *Finance against poverty*. London: Routledge.

Holmstrom, B, and Tirole, J. (1998).*Private and Public Supply of Liquidity*, A Journal of Political Economy, Vol.106, pp. 34-46.

Howells, P and Bain, K. (2004).*Financial Markets and Institutions*; Pearson Educational Limited, Edinburgh Gate.

Jalilian, H., Kirkpatrick, C., and D. Parker, "The Impact of Regulation on Economic Growth in Developing Countries: A Cross-Country Analysis", *World Development*, 35(1), pp. 87-103.

Jansen, T. & Mark, W. (1997).*Financial Regulations and its significance for microfinance in the Latin America and The Caribbean*.

Jensen, M.C. (1997). *Self-interest, Altruism, Incentives, and Agency theory*, Journal financial Management, Vol.2. Pp.23-45

Liewellyn, D. (1998). *A prospectus from the FSA: It's Approach to Regulation*, Journal of Financial Regulation and Compliance, December.

Levine, R., 2003. *Bank Supervision, Corporate Finance, and Economic Development*, *Conference on Economics, Political Institutions, and Financial Markets*, February 7-8, Stanford University. Available at: http://sshi.stanford.edu/Conferences/2002-2003/Finance2003/levine_paper.pdf.

Mugenda, M O. &Mugenda, A.G. (2003) *Research methods, qualitative and quantitative Approach*, Nairobi, Africa center for theological studies.

Musyoka, B. (2011). "Impact of financial Regulation on SACCOs in Kenya."MBA Research

Agu (1992). Analysis of the Determinants of the Nigerian banking System's profits and profitability Performance Saving and Development. University of Nigeria, Nigeria.

Akhavein, J.D., Berger, A.N., Humphrey, D.B., (1997). The Effects of Mergers on Efficiency and Prices: Evidence from a Bank Profit Function. Finance and Economic Discussion Series 9, Board of Governors of the Federal Reserve System.

Allen N, Iftekhhar H, Iikka K, Mingming(2010). Does Diversification Increase and Decrease Bank Risk and Performance? Evidence on Diversification and the Risk- Return Tradeoff. Journal of Social Science.

Barth & Levine, R. (2006). Rethinking Bank Regulation: Till Angels Govern. Cambridge University Press, New York, NY.

Barth, J.R., Caprio, G, Levine, R., (2013). Bank regulation and supervision in 180 countries from 1999 to 2011, NBER Working Papers 18733, National Bureau of Economic Research, Inc.

Barth, J.R., Gan, J., Nolle, D.E. (2004). Global Banking Regulation and Supervision: „What are the Issues and What Are the Practices”? In: Focus on Financial Institutions and Services, Journal of Finance.

Berger, A. N, Herring, R. J & Szegö, G. P 1995. _The Role of Capital in Financial Institutions,, Journal of Banking and Finance 19, 257-276.

Bhattacharya Sudiplo (1998). The Economics of Banking Regulation .Journal of money credit and banking, vol.30 No.4 p 745-770.

Bonn (2005).An Increasing Role for Competition. In The Regulation Of Banks International Competition Network Antitrust Enforcement In Regulated Sectors Subgroup.

Bonn (2005).An Increasing Role for Competition. In The Regulation Of Banks International Competition Network Antitrust Enforcement In Regulated Sectors Subgroup.

Brito, J. and Dudley, S. E. (2012). Regulation: A Primer. Mercatus Center, George Mason University and Regulatory Studies Center, the George Washington University, Washington DC, USA.

Brooks. C. (2008). Introductory Econometrics of Finance, 2nd ed., the ICMA Center,

Brunnermeier, M., & L. Pedersen. (2009). Market Liquidity and Funding Liquidity. Review of Financial Studies 22, 2201-2238.

Bank for International Settlement (2011): Capital Adequacy and Liquidity after the Financial Crisis: *International Finance Seminar 2010/2011* Bank for International Settlement (2013): Liquidity Regulation and the Implementation of Monetary Policy: *Working papers No 432* Bank for International Settlement (2013): The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools: *Basel Committee on Banking Supervision*

Malik.F. and Rafique. A. (2013); Commercial Banks Liquidity in Pakistan: Firm Specific and Macroeconomic Factors: *The Romanian economic Journal*, Vol.16, No 48, pp 139-154

Cameron, A. C. & Trivedi, P. K., 2009. Micro econometric Using Stata. USA: Stata Press Publication.

Coglianesi C. (2012). Evaluating the Impact of Regulation & Regulatory Policy. Expert Paer No1, August.

Constitution Federal Democratic Republic of Ethiopia, Article 55(1), (1987 E.C).

Damena, K. (2011) Determinants of commercial banks profitability: an empirical study on Ethiopian commercial banks. Unpublished Master's Thesis. Addis Ababa University.

Bank for International Settlement (2004): International Convergence of Capital Measurement and Capital Standards: *Basel Committee on Banking Supervision*. Bank for International Settlement (2008): Principles for Sound Liquidity Risk Management and Supervision: *Basel Committee on Banking Supervision*.

APPENDICES

Org	time	Leverage	Loan Ratio	Capital Requirement	Legal Reserve	Saving Interest Rate	Deposit Reserve	Liquidity Reserve	Non-Performing Loan
Dashen Bank	1999	0.48	0.86	75000000	14.15	0.06	0.55	0.35	0.16
Dashen Bank	2000	0.61	0.89	75000000	6.89	0.06	0.36	0.37	0.1
Dashen Bank	2001	0.38	0.9	75000000	13.57	0.03	0.49	0.31	0.11
Dashen Bank	2002	0.46	0.8	75000000	12.5	0.03	0.97	0.37	0.43
Dashen Bank	2003	0.39	0.82	75000000	13.54	0.03	0.96	0.35	0.13
Dashen Bank	2004	0.52	0.72	75000000	15.12	0.03	1.5	0.37	0.09
Dashen Bank	2005	0.4	0.78	75000000	51.2	0.03	1.04	0.36	0.04
Dashen Bank	2006	0.32	0.58	75000000	41.13	0.03	0.87	0.29	0.09
Dashen Bank	2007	0.36	0.54	75000000	3.06	0.04	1.29	0.31	0.06
Dashen Bank	2008	0.49	0.44	75000000	32.12	0.04	0.87	0.39	0.07
Dashen Bank	2009	0.64	0.59	75000000	13	0.04	1.78	0.51	0.1
Dashen Bank	2010	0.72	0.64	75000000	15.67	0.04	2.24	0.52	0.08
Dashen Bank	2011	0.55	0.44	500000000	19.3	0.04	2.84	0.46	0.07
Dashen Bank	2012	0.36	0.68	500000000	11.15	0.05	2.3	0.33	0.05
Dashen Bank	2013	0.3	0.58	500000000	13.2	0.05	2.36	0.27	0.01
Dashen Bank	2014	0.33	0.55	500000000	6.5	0.05	3.53	0.25	0.02
Dashen Bank	2015	0.32	0.59	500000000	8	0.05	3.84	0.18	0.01
Dashen Bank	2016	0.35	0.53	500000000	10.2	0.05	3.03	0.28	0.05
Dashen Bank	2017	0.33	0.48	500000000	17.3	0.05	3.05	0.32	0.02
Dashen Bank	2018	0.34	0.52	500000000	16.53	0.07	3.99	0.3	0.025
Awash International Bank	1999	0.45	0.83	75000000	11.8	0.06	0.55	0.35	0.14
Awash International Bank	2000	0.57	0.86	75000000	5.95	0.06	0.36	0.37	0.1
Awash International Bank	2001	0.37	0.89	75000000	15.35	0.03	0.49	0.31	0.2
Awash International Bank	2002	0.57	0.76	75000000	13.25	0.03	0.97	0.37	0.26
Awash International Bank	2003	0.37	0.84	75000000	13.45	0.03	0.96	0.35	0.12
Awash International Bank	2004	0.48	0.8	75000000	17.1	0.03	1.5	0.37	0.01
Awash International Bank	2005	0.37	0.81	75000000	52.03	0.03	1.04	0.36	0.12
Awash International Bank	2006	0.36	0.63	75000000	37.25	0.03	0.87	0.29	0.03
Awash International Bank	2007	0.4	0.61	75000000	5.12	0.04	1.29	0.31	0.07
Awash International Bank	2008	0.53	0.53	75000000	29.18	0.04	0.87	0.39	0.06
Awash International Bank	2009	0.71	0.64	75000000	12.2	0.04	1.78	0.51	0.08
Awash International Bank	2010	0.65	0.5	75000000	14.17	0.04	2.24	0.52	0.02
Awash International Bank	2011	0.62	0.45	500000000	17.2	0.04	2.84	0.46	0.01

Awash International Bank	2012	0.53	0.63	500000000	8.12	0.05	2.3	0.33	0.01
Awash International Bank	2013	0.37	0.65	500000000	10.75	0.05	2.36	0.27	0.02
Awash International Bank	2014	0.31	0.57	500000000	5.9	0.05	3.53	0.25	0.05
Awash International Bank	2015	0.3	0.66	500000000	9.46	0.05	3.84	0.18	0.02
Awash International Bank	2016	0.34	0.6	500000000	7.5	0.05	3.03	0.28	0.03
Awash International Bank	2017	0.35	0.61	500000000	15.3	0.07	3.05	0.32	0.05
Awash International Bank	2018	0.3	0.58	500000000	19.35	0.07	3.99	0.3	0.056
Nib International Bank	1999	0.46	0.87	750000000	11.8	0.06	0.55	0.35	0.14
Nib International Bank	2000	0.53	0.89	750000000	5.95	0.06	0.36	0.37	0.1
Nib International Bank	2001	0.34	0.89	750000000	15.35	0.03	0.49	0.31	0.2
Nib International Bank	2002	0.53	0.84	750000000	13.25	0.03	0.97	0.37	0.26
Nib International Bank	2003	0.58	0.84	750000000	13.45	0.03	0.96	0.35	0.12
Nib International Bank	2004	0.47	0.79	750000000	17.1	0.03	1.5	0.37	0.01
Nib International Bank	2005	0.49	0.71	750000000	52.03	0.03	1.04	0.36	0.12
Nib International Bank	2006	0.39	0.62	750000000	37.25	0.03	0.87	0.29	0.03
Nib International Bank	2007	0.41	0.6	750000000	5.12	0.04	1.29	0.31	0.07
Nib International Bank	2008	0.52	0.57	750000000	29.18	0.04	0.87	0.39	0.06
Nib International Bank	2009	0.63	0.63	750000000	12.2	0.04	1.78	0.51	0.08
Nib International Bank	2010	0.74	0.57	750000000	14.17	0.04	2.24	0.52	0.02
Nib International Bank	2011	0.59	0.42	500000000	17.2	0.04	2.84	0.46	0.01
Nib International Bank	2012	0.42	0.62	500000000	8.12	0.05	2.3	0.33	0.01
Nib International Bank	2013	0.34	0.63	500000000	10.75	0.05	2.36	0.27	0.02
Nib International Bank	2014	0.3	0.65	500000000	5.9	0.05	3.53	0.25	0.05

Nib International Bank	2015	0.35	0.65	500000000	9.46	0.05	3.84	0.18	0.02
Nib International Bank	2016	0.31	0.59	500000000	7.5	0.05	3.03	0.28	0.03
Nib International Bank	2017	0.32	0.55	500000000	16.7	0.07	3.05	0.32	0.07
Nib International Bank	2018	0.37	0.57	500000000	17.26	0.07	3.99	0.3	0.03
Bank of Abyssiniya	1999	0.46	0.87	750000000	13.2	0.06	0.55	0.35	0.12
Bank of Abyssiniya	2000	0.53	0.89	750000000	7.15	0.06	0.36	0.37	0.09
Bank of Abyssiniya	2001	0.34	0.89	750000000	10.7	0.03	0.49	0.31	0.04
Bank of Abyssiniya	2002	0.53	0.84	750000000	12.65	0.03	0.97	0.37	0.07
Bank of Abyssiniya	2003	0.58	0.84	750000000	13.14	0.03	0.96	0.35	0.16
Bank of Abyssiniya	2004	0.47	0.79	750000000	14.8	0.03	1.5	0.37	0.15
Bank of Abyssiniya	2005	0.49	0.71	750000000	49.7	0.03	1.04	0.36	0.11
Bank of Abyssiniya	2006	0.39	0.62	750000000	34.75	0.03	0.87	0.29	0.04
Bank of Abyssiniya	2007	0.41	0.6	750000000	2.04	0.04	1.29	0.31	0.07
Bank of Abyssiniya	2008	0.52	0.57	750000000	34	0.04	0.87	0.39	0.08
Bank of Abyssiniya	2009	0.63	0.63	750000000	12.13	0.04	1.78	0.51	0.09
Bank of Abyssiniya	2010	0.74	0.57	750000000	13.84	0.04	2.24	0.52	0.03
Bank of Abyssiniya	2011	0.59	0.42	500000000	14.15	0.04	2.84	0.46	0.02
Bank of Abyssiniya	2012	0.42	0.62	500000000	8.25	0.05	2.3	0.33	0.01
Bank of Abyssiniya	2013	0.34	0.63	500000000	10.15	0.05	2.36	0.27	0.05
Bank of Abyssiniya	2014	0.36	0.65	500000000	5.4	0.05	3.53	0.25	0.04
Bank of Abyssiniya	2015	0.35	0.65	500000000	16.5	0.05	3.84	0.18	0.01
Bank of Abyssiniya	2016	0.31	0.59	500000000	12	0.05	3.03	0.28	0.01
Bank of Abyssiniya	2017	0.32	0.55	500000000	16.5	0.07	3.05	0.32	0.06
Bank of Abyssiniya	2018	0.37	0.57	500000000	17.42	0.07	3.99	0.3	0.015
United Bank	1999	0.57	0.84	750000000	10.3	0.06	0.55	0.35	0.24
United Bank	2000	0.58	0.92	750000000	6.89	0.06	0.36	0.37	0.14
United Bank	2001	0.47	0.88	750000000	11.65	0.03	0.49	0.31	0.08
United Bank	2002	0.48	0.73	750000000	15.15	0.03	0.97	0.37	0.24
United Bank	2003	0.47	0.86	750000000	12.55	0.03	0.96	0.35	0.14
United Bank	2004	0.37	0.79	750000000	14.25	0.03	1.5	0.37	0.12
United Bank	2005	0.47	0.75	750000000	39.17	0.03	1.04	0.36	0.1
United Bank	2006	0.33	0.49	750000000	28.6	0.03	0.87	0.29	0.05
United Bank	2007	0.43	0.62	750000000	4.13	0.04	1.29	0.31	0.09
United Bank	2008	0.48	0.58	750000000	32.03	0.04	0.87	0.39	0.01

United Bank	2009	0.62	0.5	75000000	11.05	0.04	1.78	0.51	0.1
United Bank	2010	0.7	0.63	75000000	13.68	0.04	2.24	0.52	0.04
United Bank	2011	0.63	0.43	500000000	16.3	0.04	2.84	0.46	0.03
United Bank	2012	0.43	0.49	500000000	8.3	0.05	2.3	0.33	0.02
United Bank	2013	0.31	0.6	500000000	11.61	0.05	2.36	0.27	0.01
United Bank	2014	0.35	0.61	500000000	4.9	0.05	3.53	0.25	0.04
United Bank	2015	0.34	0.52	500000000	8.7	0.05	3.84	0.18	0.01
United Bank	2016	0.4	0.61	500000000	8	0.05	3.03	0.28	0.02
United Bank	2017	0.32	0.63	500000000	13.5	0.07	3.05	0.32	0.01
United Bank	2018	0.39	0.6	500000000	17.9	0.07	3.99	0.3	0.04
Wegagen Bank	1999	0.51	0.85	75000000	14.2	0.06	0.55	0.35	0.13
Wegagen Bank	2000	0.62	0.89	75000000	5.85	0.06	0.36	0.37	0.12
Wegagen Bank	2001	0.53	0.92	75000000	14.75	0.03	0.49	0.31	0.12
Wegagen Bank	2002	0.51	0.8	75000000	12.2	0.03	0.97	0.37	0.08
Wegagen Bank	2003	0.52	0.81	75000000	14.38	0.03	0.96	0.35	0.11
Wegagen Bank	2004	0.39	0.82	75000000	13.1	0.03	1.5	0.37	0.06
Wegagen Bank	2005	0.52	0.79	75000000	49	0.03	1.04	0.36	0.2
Wegagen Bank	2006	0.41	0.66	75000000	36.58	0.03	0.87	0.29	0.08
Wegagen Bank	2007	0.45	0.47	75000000	4.02	0.04	1.29	0.31	0.08
Wegagen Bank	2008	0.57	0.55	75000000	26.12	0.04	0.87	0.39	0.09
Wegagen Bank	2009	0.73	0.67	75000000	12.02	0.04	1.78	0.51	0.08
Wegagen Bank	2010	0.64	0.59	75000000	13.74	0.04	2.24	0.52	0.07
Wegagen Bank	2011	0.63	0.41	500000000	17.9	0.04	2.84	0.46	0.06
Wegagen Bank	2012	0.37	0.66	500000000	7.6	0.05	2.3	0.33	0.05
Wegagen Bank	2013	0.33	0.61	500000000	9.8	0.05	2.36	0.27	0.04
Wegagen Bank	2014	0.31	0.48	500000000	4.9	0.05	3.53	0.25	0.05
Wegagen Bank	2015	0.3	0.69	500000000	11.4	0.05	3.84	0.18	0.04
Wegagen Bank	2016	0.38	0.46	500000000	9	0.05	3.03	0.28	0.06
Wegagen Bank	2017	0.41	0.62	500000000	12.5	0.07	3.05	0.32	0.03

Secondary Data for the Effect of Bank Regulation on Financial Performance of Private Commercial Banks in Ethiopia (1999-2018). Source: National Bank of Ethiopia.

No	Name of Banks	Year of establishment
1	Awash International Bank S.C (AIB)	1994
2	Dashen Bank S.C (DB)	1995
3	Bank of Abyssinia S.C (BoA)	1996
4	Wegagen Bank S.C (WB)	1997
5	United Bank S.C(UB)	1998
6	Nib International Bank S.C(NIB)	1999
7	Cooperative Banks of Oromia S.C(CBO)	2005
8	Lion International Bank S.C(LIB)	2006
9	Oromia International Bank S.C(OIB)	2008
10	Zemen Bank S.C(ZB)	2009
11	Bunna International Bank S.C(BIB)	2009
12	Berhan International Bank S.C (BBI)	2010
13	Abay Bank S.C. (AB)	2010
14	Addis international Bank SC. (AdIB)	2011
15	Dehub Global Bank S.C. (DGB)	2012
16	Enat Bank S.C. (EB)	2013

List of private Commercial Bank in Ethiopia