



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
MBA IN ACCOUNTING AND FINANCE**

**THE EFFECT OF BANK REGULATION ON FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA**

BY: LEALEM FELEKE

**JULY, 2021
ADDIS ABEBA, ETHIOPIA**

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DECLARATION

I, LEALEM FELEKE, declare that this thesis is my original work, prepared under the guidance of ASMAMAW GETIE (Ass. Prof.). All source of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or full to any other higher learning institution for the purpose of earning any degree.

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JULY, 2021

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List of Acronyms and Abbreviations

BCBS	Basel Committee on Bank Supervision
CAMELS	Capital adequacy, Asset quality, Management, Earnings, Liquidity, and Sensitivity.
COVID-19	Coronavirus Disease of 2019
CV	Coefficient of Variation
GTP	Grand Transformation Plan
KPMG	Klynveld, Peat, Marwick, and Goerdeler
OECD	Organization for Economic Cooperation and Development
Std. Dev.	Standard Deviation

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ABSTRACT

This study sought to examine the relationship that exists between bank regulation and financial performance of commercial banks in Ethiopia. The study was guided by the buffer theory, modern portfolio theory, signaling theory, and liquidity preference theory. The research design adopted by the study was explanatory. The target population of the study was a total of 17 commercial banks and 16 of them were included in the study. The study used secondary data collected from NBE and website of each commercial banks for a period of 10 years (2010-2019). Descriptive statistics and fixed effect panel regression analysis were used to analyze the data. The results of panel data regression analysis showed that capital adequacy requirement and deposit interest have negative and statistically significant effect on banks profitability, while minimum paid-up capital requirement, liquidity requirement, legal reserve requirement, inflation, and GDP have positive and significant effect on profitability. Based on this, it is noted that the major source of income for commercial banks is obtained from deposits. Profit of commercial banks also increases with an upsurge of capital and liquidity. In addition, it is noted that commercial banks have been successful in responding to inflation. The study thus recommended commercial banks to increase their liquidity, enhance their endeavors of deposit mobilization, and to comply with capital requirements. In addition, the banks are recommended to enhance their profitability by charging a sensible interest rate that is carefully adjusted for both inflation and deposit interest rate. In the same way, NBE is recommended to strengthen the capital requirements for commercial banks even more to ensure optimal performance, to maintain public confidence and promote industry growth. The national bank is also recommended to issue regulatory mechanisms that consider the way commercial banks tend to mobilize more deposits.

Key Words: Bank regulation, financial performance, commercial banks

CHAPTER-1

INTRODUCTION

1.1. Background of the Study

There are a number of institutions that contribute for economic development of a given country. Among the various institutions, commercial banks have an invaluable role in the development of countries economy. Performance of banks has critical implications on the economic growth of countries since they are the cornerstone of economies and the basis of all financial mechanisms (Marshall, 2009). The efficient operation of banks not only enhances economic development, but also influences the income distribution of the economy and social welfare (Barth et al. 2004).

As much as banks have magnificent role in the economy, the same can be said of the effect of banks' failure in the financial system. Banks, like any other business may go bankrupt. However, unlike most other businesses, the failure of banks has worse implications. The (2007-2009) financial crisis is corroborative of how the failure of bank can trigger the economic disaster. Before 2007, USA had been deregulating their financial sector, which saw tremendous growth of the financial institutions. However, the growth could not be sustained due to the financial crises that crushed the whole industry (KPMG, 2013).

Banking regulation refers to the framework of law and rules that govern the creation and operation of banks in an economy. It extends to various aspects of banking, including who can open banks, what products can be offered and how banks can expand (Kenneth, 2000). In fact, it was from the crisis of the financial market in 1929, due to the deflation of debts, that regulation of the banking sector became indispensable (Hausmann et al., 1996). The financial crisis of 2007–2009 has also provoked a strong controversy about the usefulness of regulation (Rossi 2010). Barth, Caprio and Levine (2001) argue that all governments tend to regulate and control banks to ensure the stability of economy in general and integrity of the financial system in particular. The most basic reason for introducing regulations is to protect depositors from risks to their deposits since they hold significant portions of their funds in banks (Brunnermeier, Crockett & Goodhart, 2009). The overall objective of financial regulation aims at guaranteeing the efficient and effective functioning of the financial system and this in the interest of society in general and of all participants in particular (Wymeersch, 2019). Llewellyn, (1999) indicated that commercial banks should operate

in a safe and sound manner to avoid failure and they are subjected to thorough supervision and regulation by an independent authority.

In Ethiopia, the power to regulate the finance sector is vested to National Bank of Ethiopia (NBE) under the banking business Proclamation No. 592/2008 that has been in place since August 2008. The proclamation stated that “Business of banking has a number of attributes which, if not managed properly, has the potential to generate financial system and macroeconomic instability; where its effect on the general public and the government is significant.” The Proclamation also designated that detailed Directives shall be regularly put out and revised as deemed appropriate by NBE. Based on this, the NBE has issued various directives with the aim of protecting financial institutions from failure. Hereunder, major banking directives related to the concern of this study are potted in a concise manner.

In 2007, the reserve requirement was raised to 10% from 5% and liquidity requirement from 15% to 20% in the same time. Every commercial bank was required to maintain 10% of all local and foreign currency deposit liabilities held in the form of demand (current) deposits, saving deposits and time deposits at all times in its account opened only for this purpose, reserve account, at the NBE effective July 2007 (Directive No. SBB/42/2007). In fighting against inflationary pressure in the country, the reserve requirement was revised to the level of 15% effective April 2008 (Directive No. SBB/45/2008) and the liquidity requirement to 25%. Following the success in getting down the inflation in the country, the NBE revised the reserve requirement downwards to 10% effective January 2012 (Directive No. SBB/46/2012) and liquidity requirement to 20%. As the inflation pressure is getting down the NBE further revised the reserve requirement downwards to 5% effective March 2013 (Directive No. SBB/55/2013) and the liquidity requirement to 15%.

In September 2011, the NBE also issued Directive No. SBB/50/2011 that sets the minimum capital adequacy ratio. As per this directive, at a minimum all commercial banks shall maintain capital to risk weighted assets ratio of 8% at all times. In the same year, with the objective of enhancing capacity of commercial banks to absorb unexpected or unusual losses, the NBE raised the minimum paid-up capital for new and existing commercial banks from Birr 75 million (Directives Number SBB/24/99) to Birr 500 million (Directives No. SBB/50/2011). Amidst the NBE moral suasion that follow GTP II required banks to raise their capital level to Birr 2 billion. The later

directive is recently repealed by a new directive of Minimum Capital Requirements for Banks (Amended) Directive No. SBB/78/2021 which enters to force as of 12 April 2021. The new directive states that the minimum paid-up capital required to obtain a banking business license shall be Birr 5 billion, which shall be fully paid in cash and deposited in a bank (s) in the name and to the account of the bank under formation. This directive requires existing banks whose paid-up capital is below Birr 5 billion to raise paid-up capital to the said amount by June 30, 2026.

Regarding banks interest rate, the minimum interest rate on saving and fixed time deposit is determined by the National Bank of Ethiopia. Nevertheless, Banks have the liberty to set their interest rate above the minimum threshold. The lending rate on loan and advances is liberalized to be freely determined by each bank and is not subjected to regulatory interferences. The NBE has adjusted the minimum deposit interest rate at different times. For instance, the minimum deposit interest rate was changed from 6% to 3% in 2002. After 5 years it was changed to 4% in 2007. In 2011 it was raised to 5% and finally in 2017, NBE issued Interest Rate Directive No. NBE/INT/12/2017 that sets the minimum interest rate on saving and time deposits to be 7%.

Banks in Ethiopia, from a macroeconomic perspective, have played a pivotal role over the past decade in broadening financial access, raising national savings, and funding major public and private projects. As important, banks have recently become major sources of employment, dividends, and taxes (Cepheus Research and Analytics, 2019). In addition, banks have been earmarked as a key pillar to the achievement of the two grand plans of the country: GTP I and GTP II. As clearly indicated in the document of the plans, banks contribute to the accomplishment of the plans through fund mobilization. Total resources mobilized by the banking system in the form of deposit, borrowing and loan collection reached Birr 333.4 billion by end of 2019/20 (NBE annual report 2019/20). Therefore, studying the effect of factors that affect performance of banks is very important especially in countries like Ethiopia where the banks play an irreplaceable role to economic developments.

Different studies were conducted in the past to understand the effect of bank regulation in the sector. Most studies conducted at global and African level have focused on various regulatory variables (Such as capital adequacy, capital requirement, reserve requirement, and liquidity requirement). When we come to Ethiopia, studies conducted by Eden (2014), Shibru (2014),

Memru (2014), Nahom (2015), Adissu (2017), Fanos (2020), and Tekalegn (2020) are the prominent. In fact, different studies were conducted using some of the variables of this study individually or in combination with other variables to examine their impact on the profitability of commercial banks. However, studies conducted in Ethiopia taking bank regulation as a thematic issue are relatively small compared to other countries. In addition, most of the studies focused on the effect of a few regulatory variables especially the NBE bill purchase requirement on private commercial banks. The focus of much of the debate of previous studies, NBE bill purchase requirement, was a temporary regulation issued by the government to support the implementation of the already gone GTP I and GTP II and currently the implementation of the requirement has been expelled by the NBE. Moreover, the focus of most prior studies was private commercial banks. They excluded the state-owned bank which accounts for two-thirds of the country's total commercial banking sector in their study. Some key regulatory variables (such as legal reserve requirement and branch expansion requirement) are also remained unstudied. In general, inconclusiveness is the major gap of the extant studies and this gap motivated the researcher to conduct this study.

1.2. Statement of the Problem

Bank regulation is understood to mean all government interventions that limit banks' economic decision-making and activities through implementation of laws, rules, or standards (Koumbarakis, 2017). Bank regulation, a framework to govern the creation and operation of banks in an economy, extends to various aspects of banking including who can open banks, what products can be offered, and how banks can expand (Kenneth, 2000).

In Ethiopia, NBE issued various directives and circulars that guided how much banks' capital to asset proportion should be, how much capital is needed to establish a bank, how much liquidity of banks should be, and what kind of activities banks should participate in or not. In this regard, several studies were made to see the effect of NBE regulation on the financial performance of private commercial banks in Ethiopia. The researches highlighted the various effects of NBE regulations on the performance of commercial banks. Eden (2014) indicated that NBE bill purchase requirement and reserve requirement have negative and significant impact on banks ROA. In the same year, others studies by Shibru (2014), Tesfaye (2014), and Memru (2014) indicated that NBE bill purchase requirement is negatively related to performance of private

commercial banks in Ethiopia. Nahom (2015) concluded that capital adequacy and NBE bill purchase requirement are major determinant of banks' ROE; liquidity, inflation rate, and NBE bill purchase requirement are major determinant of NIM. Dakito (2015) found positive relationship between capital adequacy and banks' ROA. Addisu (2017) showed that capital requirement and bank size have positive and significant effect on ROA of banks; capital adequacy and reserve requirement have negative and significant effect on ROA. Fanos (2020) indicated that capital adequacy has negative and significant effect on ROE; legal reserve requirement, capital requirement, and NBE bill purchase requirement has insignificant effect on ROE. Tekalign (2020) determined that capital adequacy and bank size have negative and insignificant effect on ROA; lending interest rate and liquidity requirement have positive and significant effect on ROA.

As mentioned above, different studies have been done in the past to determine the effect of bank regulation on financial performance of commercial banks. However, the researcher believes that for the reasons listed below, those studies are not adequate to understand the effect of bank regulation on financial performance of banks in Ethiopia.

First, previous studies have focused only on private commercial banks, none of them have studied the state-owned commercial bank. The researcher believes that it is arbitrary to look at only private commercial banks while the regulations of NBE are equally applied to all commercial banks. In addition, exclusion of the state-owned commercial bank, which is the largest share of commercial banks in Ethiopia, does not enable to understand the effect of bank regulation. The big giant in Ethiopian banking, CBE, enjoys a dominant 62% market share in terms of assets and deposit, 66% for loans, 50% for capital, and just under 50% for profits (Cepheus Research and Analytics, 2019). Therefore, this study comprises the state-owned commercial bank (CBE) apart to the private commercial banks.

Second, there is imprecise view between the statutory reserve requirement and the legal reserve requirement among the previous studies. The National Bank of Ethiopia (NBE) issued *Directives No. SBB/4/95* that demand every bank, after fulfilling the initial minimum capital, to transfer **25%** of its annual net profit to its legal reserve account until such account equals its capital. When the legal reserve account equals the capital of the bank, the amount to be transferred to the legal reserve account shall be **10%** of the annual net profit. On the other front, NBE in its statutory *Reserve*

Requirement – 6th Replacement Directive No. SBB/55/2013, requires any bank operating in Ethiopia to maintain in its reserve account **5%** of all Birr and foreign currency deposit liabilities held in the form of demand (current) deposits, saving deposits and time deposits.

As clearly stated, the concepts of the two requirements are quite different. However, out of the previous studies: Eden (2014), Adissu (2017), Fanos (2020) and Tekalign (2020), only Fanos (2020) implemented the appropriate ratio (Reserve amount in NBE/deposit) to measure Statutory Reserve Requirement. The remaining studies measured Statutory Reserve Requirement in terms of the ratio of reserve amount in NBE to total asset which should be instead used to measure the Legal Reserve Requirement. Moreover, the studies inappropriately used the term Legal Reserve Requirement while they studied the Statutory Reserve Requirement. In other words, none the previously undertaken researches addressed the issue of Legal Reserve Requirement which is clearly placed in **Directives No. SBB/4/95**. Therefore, this study tries to clear the confusion by examining the two regulatory variables separately along with the appropriate measurement.

There is also another regulatory variable (i.e., Branch Expansion Requirement) that remain unstudied by the previous studies. The regulatory variable is mainly related to the implementation of GTP. Therefore, studying of this variable is the other distinguishing point between this study and extant researches in that the study tries to examine bank regulation in conjunction with related economic policies. GTP I and GTP II has clear set policy directions that describes the expected contribution of banks to economic growth. Based on this, commercial banks have contributed a lot in supporting the execution of GTP I that extended from 2010/11 – 2014/15 and GTP II that extended from 2014/15 – 2019/20. One of the ways that private commercial banks support the implementation of the plan was through the purchase of 27% NBE bills. The other way banks were required to support the plan was through branch expansion. As clearly indicated on the document of GTP I, it was expected to increase access to finance from 20% in 2010/11 to 67% by the end of the plan period (GTP I, Volume I: Main Text, 2010, p. 34). In the same manner, it was clearly directed on the document of GTP II to expand the total number of bank branches from 2,868 in 2014/15 to 5,736 by 2019/20 (GTP II, Volume I: Main Text, 2016, p. 111). Government has pursued several policies that encourage banks to expand their branch. Based on this, NBE moral suasion that follows the issuance of the GTPs has placed a **25%** annual increment in branch network as an important policy direction to be followed by commercial banks. In economics, moral

suasion refers to policy of central banks to persuade and exert pressure on commercial banks to do certain things or refrain from doing certain things. It can be exercised through discussions, letters, speeches and hints thrown to banks (Qayed, 2004).

The researcher considers the addition of the variables is important in that they are assumed to be key regulatory factors which are expected to play an important role in the conduct and performance of commercial banks. Given what has been said, this research is designed to bridge the knowledge gaps by examining the combined effect of six key regulatory variables (capital adequacy requirement, minimum paid-up capital requirement, liquidity requirement, statutory reserve requirement, legal reserve requirement, and bank branch expansion requirement) on the financial performance of commercial banks in Ethiopia proxied by ROA. To fulfil this purpose, a quantitative type of study is employed on 16 commercial banks in Ethiopia that operate since 2010.

1.3. Objectives of the Study

1.3.1. General Objective

This study is designed to examine the effect of bank regulation on financial performance of commercial banks in Ethiopia.

1.3.2. Specific Objectives

The specific objectives of the study are:

1. To examine the effect of capital adequacy requirement on the financial performance of commercial banks in Ethiopia.
2. To examine the effect of minimum paid-up capital requirement on the financial performance of commercial banks in Ethiopia.
3. To examine the effect of liquidity requirement on the financial performance of commercial banks in Ethiopia.
4. To examine the effect of statutory reserve requirement on the financial performance of commercial banks in Ethiopia.
5. To examine the effect of legal reserve requirement on the financial performance of commercial banks in Ethiopia.
6. To examine the effect of branch expansion requirement on the financial performance of commercial banks in Ethiopia.

1.4. Research Hypotheses

The following hypotheses are developed after a complete review of theoretical aspects and previous empirical studies related to the research topic.

Capital Adequacy and Financial Performance

The signaling theory, bankruptcy cost hypothesis, modern portfolio theory and buffer theory support the existence of a positive relationship between capital and profitability. Modern portfolio theory states that a high capital requirement enable commercial banks to reduce portfolio risk. According to the buffer theory, banks prefer to maintain capital in excess of prudential limits to reduce the chances of falling below legal capital requirements since breaching the regulatory provisions will lead them to penalties. Empirical studies also indicate the positive relationship between capital and profitability. Berger, Herring, and Szego (1995) justified the main reason for banks to have capital adequacy is if bank owners have more capital at risk, the gains that they would enjoy from risk business would be compensated by the potential loss of their capital if their bank were to experience large losses. With limited liability, the tendency for bank owners to shift toward higher risk activities decreases with the amount of high capital at risk (Lamoreaux, 1994). Other studies; Dakito (2015), Ikpefan (2015), Torbira and Zaagha (2016) indicated the significant role of capital adequacy in explaining banks' profitability. They found the positive relationship between capital adequacy and bank financial performance which was measured in terms of return on asset.

- *H₁: Capital adequacy requirement has positive and significant effect on the financial performance of commercial banks in Ethiopia.*

Minimum Paid-up Capital and Financial Performance

Based on the modern portfolio theory, the ability of commercial banks to take risks depends on extent of regulations of capital requirements to improve the solvency of commercial banks. The argument is that high leverage ratio leads banks to shift their portfolio to riskier assets. Thus, a high capital requirement gives commercial bank ability to reduce portfolio risk. In addition, meeting minimum capital requirement reduces the chances of bank distress so long as banks will not be pressured by short-term borrowing at high cost. Empirical studies also have revealed the importance of minimum capital to make profits through making banks competitive in the sector.

Aderinokun (2004) indicated that an increase in the capital base of banks improve performance as it enables them to expand the scope of their activities within the industry, reduce risk, ensure quality asset management as well as puts banks in a strong liquidity position. Nguyen (2020) argues that adequately capitalized banks are able to undertake greater business expansion, finance large number of diverse transactions across sectors, allocate resources to be improved technologically as well as come up with innovative financial products to remain competitive. Addisu (2017) indicated that capital requirement has a positive and significant effect on profitability of commercial banks proxied by ROA.

- *H₂: Minimum paid-up capital requirement has positive and significant effect on the financial performance of commercial banks in Ethiopia.*

Liquidity and Financial Performance

According to the liquidity preference theory, commercial banks must deal with liquid assets to fulfill the demand of depositors. A positive and significant link between bank liquidity and profitability were examined in the studies of Adebayo et al. (2011), Wambu (2013), Kurawa & Abubakar (2014), Nahom (2015), and Tekalegn (2020). The studies result indicated that liquidity increases the profitability of banks. This is because banks with high liquidity risk (low liquidity) commonly lack stable and cheap funding, and therefore may be forced to borrow from the capital markets at a higher interest rate.

- *H₃: Liquidity requirement has positive and significant effect on the financial performance of commercial banks in Ethiopia.*

Statutory Reserve Requirement and Financial Performance

Empirical studies indicate the inverse relationship between reserve requirement and financial performance for the reason that banks would have made a better profit if they had invested the money in the reserve account that pays no interest. Bank statutory ratio was found to have negative and significant effect on profitability of banks in the study of Punita & Somaiya (2006). Studies such as Eden (2014), S. Fatima Abid and Lodhi (2015), and Addisu (2017) also indicated that increase in reserve requirement have an inverse effect on banks profitability.

- *H₄: Statutory reserve requirement has negative and significant effect on the financial performance of commercial banks in Ethiopia.*

Legal Reserve Requirement and Financial Performance

Legal reserves are required to strengthen the financial position of banks so that they can cope with urgent events specific to the company or the economic situation. Punita & Somaiya (2006) indicated that legal reserves are important to ensure the smooth running of business operations in that they are used to offset losses from the previous year that cannot be covered by net profits from the present year or by the use of other reserves. The prime motive of creating legal reserves is to ensure adequate liquidity whenever fund is required to meet future obligations. The reserve is also important to increase the actual value of shares above their par value by assuring investors that their investment is secured by means of reserves i.e., it helps to build trust among investors (Jain, 2020)

- *H₅: Legal reserve requirement has positive and significant effect on financial performance of commercial banks in Ethiopia.*

Branch Expansion and Financial Performance

Empirical studies indicated the positive effect of branch growth on the bank's profitability in terms of increasing access to banking services and increasing deposit mobilization. Zardhoohi and Kolari (1994) tested the impact of branch network spread on performance of commercial banks in Finland and found that it led to improved access and convenience to banking services. Customers saved huge transport costs; this attracted more sales which resulted into bank profitability. In the same way, Seale (2004), Adelowotan (2016), and Nyatika (2017) recognized that spread in bank branch networks contributes for the financial performance.

- *H₆: Branch expansion has positive and significant effect on the financial performance of commercial banks in Ethiopia.*

1.5. Significance of the Study

At the end of this study, it is assumed that the following benefits will be available. Above all, the study will help us to have a better understanding on the effect of NBE regulations on financial performance of commercial banks in Ethiopia since it focuses on extents which previous studies on similar topic were not able to provide coverage on. Therefore, filling knowledge gap is an important contribution of the study. Furthermore, the following parties will be beneficiaries from the study's result. First, management team of commercial banks will get a clear picture on

regulatory variables that affect the performance of their banks. So, they become able to influence the NBE. Second, the study result will give an insight to NBE's management team on the impacts of the regulatory variables with respect to the performances of commercial banks. This in turn enables them to take the findings of the study into account when amendments of existing directive or issuance of a new directive is necessary in the future.

1.6. Scope of the Study

The study is mainly concerned on the effect of bank regulation on financial performance of commercial banks in Ethiopia. To achieve this purpose, the study is limited to one dependent, six independent and four control variables. Capital adequacy requirement, minimum paid-up capital requirement, liquidity requirement, statutory reserve requirement, legal reserve requirement, and branch expansion requirement are the independent variables and the study investigates their effects on financial performance of 16 commercial banks in Ethiopia for a time period of 10 years i.e., 2010-2019. Financial performance of the commercial banks is measured in terms of ROA. Finally, 2021 is the year when the research was held on.

1.7. Limitation of the Study

There are about forty-four banking directives issued on the website of NBE including amendments. Of these directives, the study focuses on only five directives that the researcher believes they would directly affect the financial performance of commercial banks. This means that there are bank regulatory measures not included in the study. Hence, the study does not necessarily reflect the overall effect of bank regulation on financial performance. Instead, the study shows the impact of NBE bank regulatory measures which are expected to directly affect the financial performance of commercial banks in Ethiopia.

1.8. Organization of the Study

The rest of the research report is organized as follow. The second chapter deals about reviews on related literatures. It comprises both theoretical and empirical aspects. Chapter three provides detail description of the methodology employed in the research. Chapter four is about study results and discussion. Finally, in chapter five conclusion of the study findings are presented along with recommendations.

CHAPTER-2

LITERATURE REVIEW

2.1. Introduction

This chapter is an in-depth view into what is already known in connection with the research topic. The chapter is divided into three main parts. The first part covers the theoretical review that leads to the development of conceptual framework. The second part deals with the review of existing literature in accordance with the study variables. Finally, the third part is presented with summary of research gaps.

2.2. Theoretical Review

Several theories were advanced by different scholars to explain bank regulatory requirements and financial performance of commercial banks. Those theories which are related to the concern of this study are reviewed as follow.

2.2.1. Economic Theories of Bank Regulation

There are two contradicting arguments in the economic theory of bank regulation namely: public interest theory and private interest theory. The core of the theories is about the causes and purposes of bank regulation.

2.2.1.1. Public Interest Theory

Public interest theory was first developed by Arthur Cecil Pigou (1932) who holds that regulation is supplied in response to the demand of the public for the correction of inefficient market practices expressed in terms of externalities and informational asymmetries. The inefficiencies create a constructive role for the strong helping hand of government to offset market failures. Thus, the public interest theory is sometimes referred as the helping-hand view. According to the theory, regulations (such as official supervision of banks, limits on bank activities, restrictions on bank entry, and a deposit insurance scheme) are triggered when resources are not allocated to their highest valued uses, defined as 'market failure' (Posner, 1974). In general, the public interest theory highlights the importance of bank regulation to prevent market failure by providing minimal

quality standards that reduce agency costs and also serves as a substitute for the monitoring of the lender and borrower (Stillhart, 2002).

There are two main causes of market failure in the theory known as asymmetric information and externalities.

I. Asymmetric Information

Stiglitz and Weiss (1981) utilized two assumptions to provide evidence of problem of asymmetric information and increased interest rate in the credit market. First, they assume a credit market with ‘good’ and ‘bad’ borrowers. Second, they assume the concept of credit rationing which is restriction on loaning amount. According to Stiglitz and Weiss (1981), a higher interest rate in the credit market will have two effects. First, due to the rationing of credit ‘good borrowers’ either do not receive loans or do not receive the desired amount of loans since banks impose a higher interest rate on borrowing. This leads to a situation where ‘bad borrowers’ crowd out ‘good borrowers’ and results the problem of adverse selection. Adverse selection in banking occurs when the potential borrowers who are the most likely to produce undesirable (adverse) outcomes are the ones who most actively seek out a loan and are thus most likely to be selected (Mishkin, 2013). Second, increasing interest rates could increase the riskiness of the bank's loan portfolio, either by discouraging safer investors or by inducing borrowers to invest in riskier business projects. This effect represents the moral hazard which is the problem created by asymmetric information after the transaction occurs between the bank and the borrower. The moral hazard in banking is the risk (hazard) that the borrower might engage in activities that are undesirable (immoral) from the lender’s point of view (Mishkin, 2013).

II. Externalities

The first person who introduced the concept of externalities into public finance was Pigou (1932). He posited that, externalities arise whenever there are either positive or negative side effects in the consumption or production of an economic agent. The concept of externalities was also defined by Marshall (1997). According to Marshall (1997), all cost and benefit factors that directly influence decision makers are internal effects and externalities are the residual of internal effects. The concept of externalities from Pigou (1932) and Marshall (1997) can also be used in the bank

regulation literature. Any market action taken by one player in the banking system always affect the economic position of all the other players in the system. In other words, the failure of one bank has contagion effects on the system since the monetary and credit systems are interconnected.

One source of bank failure that results contagion effect is the problem of bank runs which is the risk that lenders run to withdraw their deposits under the sequential service constraint (Diamond and Dybvig, 1983). Banks participate in the money creation process and thus inject undesirable instability into the monetary system via unexpected reserve behavior (Baltensperger and Dermine, 1987). In the presence of a bank failure, credit information will be lost in the market that leads borrowers to take out loans under unattractive conditions, which means that more expensive credit terms are offered that imply lower investment and possibly unemployment (Baltensperger, 1990). Macroeconomic externalities (contagion effects) from bank failures are one explanation to justify permanent banking regulation. The goal of bank regulation is thus to prevent a run across several banks that together reach a level that threatens the survival of the banks and the banking system (Ruckriegel et al., 2000).

2.2.1.2. Private Interest Theory

The origin of private interest theory of regulation owes more to the work of Mancur Olson (1965). Olson (1965) posited that since group interests are collective goods, only small privileged groups with access to selective incentives (such as industry cartels, professional associations, and unions) could overcome collective action problems in realizing group goals. These organized interest groups directly or indirectly involve in designing and implementing regulation in the decision-making process and trying to exploit supervisory authorities. Olson's insight stimulated members of the Chicago School, beginning with Stigler, to explain how regulations is acquired by the industry and is designed and operated primarily for its benefit. Stigler (1971) asserted that there is a market for regulation, just as there is for other goods and services. In Stigler's model, government regulators are suppliers of regulatory services (exchanging regulatory rents for various forms of political income or personal gain), while the regulated industry is the primary source of demand. In this regard, Kane (1985) was one of the first scholars to apply private interest theory to the banking sector. According to Kane (1985), interest groups as depositors or investors request banking regulation to reduce their own risk.

The private interest theory is based on the assumption that governments frequently do not implement regulations to minimize market failures. Instead, governments implement regulations in a grabbing-hand manner that supports political constituencies such as attracting campaign donations, benefiting favored voters and extracting bribes (Shleifer and Vishny, 1998). Due to this, the theory is sometimes known as grabbing-hand view. The grabbing-hand alternative highlights the potential negative implications of government regulation banks' performance. Some of the reasons are greater fee requirements (rent extraction) and corruption by the government that forces banks to use the costliest financing source (equity than deposit), and entry barriers that reduce competition and impedes banks from innovation and efficiency (Barth et al 2006; Pasiouras et al 2009; and Leaven and Levine 2009).

2.2.2. Theories on Financial Performance of Commercial Banks

Factors influencing the performance of banks have grabbed the attention of the many research for the fact that any effect on banks is apparent in many sectors. Scholars began conducting research on the performance of the banks between 1970 and 1980. They applied two models named as market power theory and efficient structure theory to explain the correlation between profitability of banks and regulation resulted market share concentration (Athanasoglou et al., 2006).

2.2.2.1. The Market-Power Theory

The market power theory assumes that bank profitability is a function of external market factors. The theory includes two hypotheses: the structure-conduct-performance hypothesis and the relative-market power hypotheses. The structure-conduct-performance hypothesis argues that more concentrated markets lead to higher loan rates and lower deposit rates because of lessened competition. Smirlock (1985) indicated market share and profitability are positively correlated and his method assumed that a higher market concentration is the main source of market power. On the other hand, the relative-market power hypothesis argues that only large banks with some "brand identification" can influence pricing and raise profits. Shepherd (1986) criticizes considered that the direct source of market power is the domination of participants over the individual market. It is uniquely the banks with a large market share and diversified products that might exert their market power to determine prices and make profits. Consequently, under the relative market power hypothesis, individual market shares accurately determine market power

and market imperfections. The difference between those two hypotheses revolves around whether market power is generic to a market or specific to individual banks within a market.

2.2.2.2. The Efficient-Structure Theory

The efficient structure theory largely assumes that bank performance is influenced by internal efficiencies and managerial decisions. Berger (1995) divides the efficient structure theory into X-efficiency and Scale-efficiency hypotheses. The X-efficiency hypothesis argues that banks with better management and practices control costs and raise profit. In other words, the costs incurred by banks with efficient management and/or technologies are lower resulting in higher profitability. On the other hand, the Scale-efficiency hypothesis argues some banks achieve better scale of operation and, thus, lower costs which in turn leads to higher profit and faster growth.

The performance of the banks is also affected by balance sheet ratio, signaling, and bankruptcy costs. In this regard, some scholars have explained that higher profits can be fetched by high equity to asset ratio. According to Berger (1995), these explanations are consequence of application of ***Signaling Theory and Bankruptcy Costs Hypothesis***. Market value of the bank increases with high equity ratio according to signaling theory. On the other hand, bankruptcy cost hypothesis states that banks hold high equity to avoid period of distress. Hence, both the signaling theory and bankruptcy cost hypothesis support the existence of a positive relationship between capital and profitability.

2.2.3. Theories on Bank Regulatory Measures

Bank regulatory measures can be classified into ‘prudential’ and ‘protective’ based on timing of intervention (Koumbarakis, 2017, p. 81-82). Prudential regulation includes regulatory instruments that are applied during the normal ongoing course of banking business with objective of rendering the risk prior to financial distress. Some of regulatory banking measures included in prudential regulation are capital adequacy requirements, liquidity requirements, countercyclical capital buffers, and accounting standards and transparency regulation. In contrast, protective regulation includes all regulatory instruments that have the objective of minimizing damage to the economy either during or following financial distress. Protective regulation contains deposit insurance, failed bank recovery and resolution, public guarantees and subsidies by the government and the lender of last resort. In general, prudential measures are applied during the normal ongoing course

of banking business (going concern), whereas protective measures are applied in the event of imminent financial distress or after an event of financial distress (gone concern).

2.2.3.1. Modern Portfolio Theory

The modern portfolio theory was developed by Markowitz (1952). According to the theory, proper choice of a good mix of various assets enables companies to take advantage of the expected return on portfolio for a given amount of portfolio risk. Portfolio models is a basis of analyzing whether regulation is a necessity or not. Based on this context, the ability of commercial banks to take risks depends on extent of regulations of capital requirements to improve the solvency of commercial banks. Kim & Santomero (1988) were the first to use the concept of portfolio analysis to show the significance of capital requirement regulations. The argument is that high leverage ratio leads banks to shift their portfolio to riskier assets. Thus, a high capital requirement gives commercial bank ability to reduce portfolio risk.

2.2.3.2. Liquidity Preference Theory

The other theory that guided the study is liquidity preference theory proposed by United Kingdom economist John Maynard Keynes (1936). Keynes observed that all factors held constant, people prefer to hold cash rather than any other form of assets and they will demand a premium for investing in illiquid assets such as bonds, stocks, and real estates. According to Keynes (1936), demand for money is categorized in three motives; firstly, transaction motive which is desire to have cash for basic transaction such as for transport, wages, or raw material payment. Secondly, precautionary motive which is holding cash to cater for any unexpected expenses if happens such as accident or illness. Thirdly, speculative motive which is to hold cash and anticipate future changes to exercise your rights in stock buying. Liquidity preference theory continue to dominate the central concepts in economic and finance in its application on the theory of demand for money. Interest rate is a reward for not holding liquid asset for specified period which it is calculated by the demand and supply of money. With regards to the theory, central banks set the rate of interest in order to control the price of assets through the demand for money. Commercial banks deal with liquid assets which can be demanded anytime by depositors. The theory explains why banks are expected to fulfil liquidity demand and undertake to compensate for liabilities.

2.2.3.3. *The Buffer Theory*

The buffer theory of capital adequacy was developed by Calem and Rob (1996). The theory points out that as banks approach the minimum capital requirements, they tend to raise capital to avoid costs which may be incurred due to breaching capital requirements. According to Milne and Wiley (2001), buffer is a term used to show the excess capital held by the bank beyond the minimum requirement. Banks prefer to maintain capital in excess of prudential limits to reduce the chances of falling below legal capital requirements since breaching the regulatory provisions will lead them to penalties. In general, excess capital leads to reduction of costs which could result in penalties in case of breach of regulatory requirement and hence support operations that result improved financial performance.

2.2.4. Bank Regulatory Measures in Ethiopia

As described above, bank regulatory measures are classified into ‘prudential’ and ‘protective’ based on timing of intervention. The focus of this study is prudential regulations that are applied during the normal ongoing course of banking business. Hereunder some of prudential regulations that are the interest of this study are presented along with the corresponding directives issued by National Bank of Ethiopia (NBE).

2.2.4.1. *Capital Requirements*

Capital adequacy one of the components of capital requirement could play a crucial role in aligning the incentives of bank owners with depositors and other creditors (Berger, Herring, and Szego, 1995); The main reason for banks to have capital adequacy is if bank owners have more capital at risk, the gains that they would enjoy from risk business, would be compensated by the potential loss of their capital if their bank were to experience large losses. Traditional approaches to bank regulation emphasize the positive features of capital adequacy requirements (Dewatripont and Tirole, 1994). With limited liability, the tendency for bank owners to shift toward higher risk activities decreases with the amount of high capital at risk (Lamoreaux, 1994). Capital, or net worth, serves as a buffer against losses by increasing banks’ resilience to future banking crises (Liikanen et al. 2012). In addition, the capital requirement provides the supervisor with room for intervention before the bank becomes insolvent (Hellwig 2010b).

The capital regulation reflects the buffer theory and modern portfolio theory. The helping-hand view also suggests that government play a positive role in bank stability through implementing effective bank entry requirements. Banks with monopolistic power have stronger incentives to incur the necessary costs associated with overcoming informational barriers, which then facilitates the flow of credit to more worthy enterprises. Furthermore, banks with monopolistic power may possess considerable franchise value, which enhances prudent risk-taking behavior (Keeley, 1990).

The minimum capital standards made by the Basel Committee on Banking Supervision in 1988, was designed to increase the safety and soundness of the international banking system and to set a level playing field for banking regulation (Karina and Anggono, 2014). The Basel Accords are a series of three sequential banking regulation agreements (Basel I, II, and III) set by the Basel Committee on Bank Supervision (BCBS) to ensure that banks hold enough cash reserves to meet their financial obligations and survive in financial and economic distress (Mona A, 2017). In 1988, members of the G-10 countries adopted Basel I that mainly focused on providing capital for credit risk. With Basel I, capital ratios are calculated through applying predetermined risk weights to a bank's credit exposure. Based on this the Bank's capital is expected to be at least 8% of risk adjusted assets. However, Basel I was found to be inefficient following the emergence of new financial instruments that increases the exposure of banks to operational, market, sovereign risk and other risks. To address the weaknesses of Basel I, in 2004 the Basel Committee introduced the second version of the international convergence of capital measurements and capital standards known as Basel II. Basel II, an extension of Basel I, included new regulatory additions and was centered around improving three key issues: minimum capital requirements, supervisory framework, and market discipline. The 2008 Global Financial Crisis exposed the weaknesses of the international financial system and led to the creation of Basel III. The BCBS considered poor governance and risk management, inappropriate incentive structures, and an overleveraged banking industry as reasons for the crises. In November 2010, Basel III was introduced. It was acquainted with new capital reserve requirements and countercyclical measures to increase reserves in periods of credit expansion and to relax requirements during periods of reduced lending. It also categorizes banks into different groups based on their size and overall importance to set reserve requirements. Larger banks were subjected to higher reserve requirements due to their greater importance to the economy. The terms of Basel III were eventually finalized in

December 2017. However, its implementation has been delayed, due to the impact of COVID-19, and the reforms are now expected to take effect in January 2023 (Chen J., 2021).

The National Bank of Ethiopia (NBE) has issued numbers of capital requirement directives at different times. The NBE has recently issued a directive (*Minimum Capital Requirement for Banks (Amended) Directives No. SBB/78/2021*) which enters to force as of 12 April 2021 and states that the minimum paid-up capital required to obtain a banking business license shall be **Birr 5 billion**, which shall be fully paid in cash and deposited in a bank (s) in the name and to the account of the bank under formation. This directive requires existing banks whose paid-up capital is below Birr 5 billion to raise paid-up capital to the said amount by June 30, 2026 and to submit action plan for capital increases to the national bank within 30 days after the effective date of the directive. The new directive also states that the minimum capital adequacy ratio which all licensed banks shall maintain at all times is 8%. The regulatory framework for the computation of capital adequacy ratios for the commercial banks in Ethiopia currently follows a modified version of Basel I, although the NBE plans to implement Basel II in the future (IMF Country Report No. 20/323).

2.2.4.2. Reserve Requirements

Banks after fulfilling the initial minimum capital, they are subject to the following requirements so that they will have sound reserves account. According to the NBE directive (*Reserve Requirement – 6th Replacement Directive No. SBB/55/2013*), banks operating in Ethiopia shall open two separate Birr accounts with National Bank of Ethiopia to be used as follows:

1. **Reserve Account** – which shall exclusively be used to maintain the reserve balance. No bank shall withdraw any money from its reserve account without prior approval of the National Bank of Ethiopia.
2. **Payments and Settlement Account** – which shall be used to carry out all day-to-day transactions of banks through the National Bank of Ethiopia.

The National Bank of Ethiopia (NBE) issue *Directives No. SBB/4/95* that demand every bank, after fulfilling the initial minimum capital, to transfer 25% of its annual net profit to its legal reserve account until such account equals its capital. When the legal reserve account equals the capital of the bank, the amount to be transferred to the legal reserve account shall be 10% of the annual net profit. Additionally, the *Reserve Requirement – 6th Replacement Directive No.*

SBB/55/2013 requires any bank operating in Ethiopia to maintain in its reserve account **5%** of all Birr and foreign currency deposit liabilities held in the form of demand (current) deposits, saving deposits and time deposits.

2.2.4.3. Liquidity Requirement

A more formal definition of liquidity is the ability to meet all claims that fall due, at any time and without restriction (Greenbaum and Thakor, 2007). The major problem in the 2007–2009 financial crisis was the lack of liquid assets and liquid funding. Therefore, liquidity requirements have been proposed to increase the resilience of banks (Liikanen et al. 2012). A bank with good assets quality, strong earnings and sufficient capital may yet fail if it is not maintaining adequate liquidity (Arif & Anees, 2012). Banks with high liquidity risk commonly lack stable and cheap funding, and therefore may be forced to borrow from the capital markets at a higher interest rate. Liquidity preference theory, which refers to the desire of investors to hold cash, support prudential regulations that require banks to hold a certain amount of liquid assets in case a financial distress event occurs. The public interest theory also justifies the importance of liquidity requirements to tackle the effect of bank run and the accompanying externalities.

With regard to liquidity requirements, National Bank of Ethiopia (NBE) issue a directive (***Liquidity Requirement (5th Replacement) Directives No. SBB/57/2014***) that requires any licensed commercial bank to maintain liquid assets of not less than **15%** of its net current liabilities. ***“Liquid assets”*** as per the directive include cash, deposits with the National Bank and other local and foreign banks having acceptance by the National Bank, other assets readily convertible into cash expressed and payable in Birr or foreign currency having acceptance by the National Bank, deposits held in Organization for Economic Cooperation and Development (OECD) member countries’ currencies and payable by banks of OECD member countries and in such other currencies as may be approved by the National Bank as well as securities issued by OECD member countries denominated in currencies of such countries and such other assets as the National Bank may from time to time declare to be liquid assets. The directive also defines ***“Current liabilities”*** as the sum of demand (current) deposit, saving deposits, and time deposits and similar liabilities with less than one-month maturity.

2.2.4.4. Branch Expansion Requirement

The two grand plans of Ethiopia; GTP I that extended from 2010/11 – 2014/15 and GTP II that extended from 2014/15 – 2019/20 has gone away. In those periods, commercial banks have contributed a lot in supporting the execution of the plan. One of the ways that commercial banks support the implementation of the plan was through the purchase of NBE bills. On 4 April 2011, the NBE issued a directive (NBE Directive No. MFA/NBE Bills/001/2011) that require all private commercial banks to invest 27% of every loan disbursement in NBE bills for five years at a very low interest rate, 3%, far below from what banks pay as an interest for the deposit. However, NBE has recently repealed the NBE-Bill Purchase directive with a new directive, NBE–Bill Purchase (Repealing) Directive No. MFA/NBEBILLS/004/2019, which was come into force as of the 20th November 2019. The other way banks were required to support the plan was through branch expansion. Improving the coverage and quality of financial service was one of the emphasis of GTP I. As clearly indicated on the document of GTP I, it was expected to increase access to finance from 20% in 2010/11 to 67% by the end of the plan period (GTP I, Volume I: Main Text, 2010, p. 34). In the same manner, it is clearly directed on the document of GTP II, to expand the total number of bank branches from 2,868 in 2014/15 to 5,736 by 2019/20 (GTP II, Volume I: Main Text, 2016, p. 111). Government has pursued several policies that encourage banks to expand their branch. Based on this, NBE moral suasion that follows the issuance of the GTPs has placed a **25%** annual increment in branch network as an important policy direction to be followed by commercial banks.

In economics, moral suasion is the policy of central banks to persuade and exert pressure on commercial banks so as to enlist the co-operation of commercial banks or of other financial organizations in pursuit of some objective of financial policy (Qayed, 2004). Moral suasion in central banking is also defined as the attempt to coerce private economic activity via governmental exhortation in directions not already defined or dictated by existing statute law (Romans, 1996). Central banks use moral suasion to influence market and public sentiment into believing that they are in control of the economy and ready to act if needed. Most of this moral suasion involves verbal gestures and signaling through central bank minutes that can be picked apart by analysts and journalists (Romans, 1996).

2.2.5. Measurements of Banks' Financial Performance

Financial performance is the process of measuring the results of a firm's policies and operations in monetary terms (Erasmus, 2008). The profits fetched by the banks best reflect their financial performance (Goddard et al., 2004). Hence, profitability becomes the important part of the performance of the banks. According to Rushdi and Tennant (2003), profitability can be measured in a number of ways including return on assets and return on equity. In this study, return on asset is used as the key proxy for bank profitability instead of the alternative return on equity because an analysis of return on equity disregards financial leverage and the risks associated with it (Kosmidou et al., 2005).

ROA, the major ratio that indicates the profitability of a bank, is a ratio of net income after tax to average total asset (Khrawish, 2011). It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the management of a company use resources to generate income (Khrawish, 2011). Thus, it can be inferred from the above statement that the higher the ROA the more profitable is the bank and the more efficient is the management in utilizing assets.

2.3. Empirical Review

In this section, empirical studies related to the study area are provided in three parts. The first section is presented with different global researches conducted in various countries outside Africa. In the second section, studies conducted in Africa countries are reviewed. Finally, the third section go over researches whose rim mainly revolves around the effect of bank regulation on commercial banks in Ethiopia.

2.3.1. Global Studies

Demirguc-Kunt, Laeven, and Levine (2003) examined the impact of bank regulations, concentration, inflation and national institutions on banks' net interest margins using data on over 1,400 banks across 72 countries. The study indicates that tighter regulations on bank entry and bank activities boost net interest margins. Inflation also exerts a robust, positive impact on bank margins.

A study was carried out by Punita & Somaiya (2006) to investigate the effect of monetary policy on the profitability of banks in India for the period 1995-2000. The monetary variables were lending rates, legal reserve ratio and statutory ratio, and each regressed-on bank profitability independently. Lending rate was found to have positive and significant influence on banks profitability, which indicates a fall in lending rates will reduce the profitability of the banks. Also bank legal reserve ratio has positive and significant effect. However, statutory ratio was found to have negative and significant effect on profitability of banks.

In addition, S. Fatima Abid and Lodhi (2015) examined the relationship between reserve requirement ratio and banks profitability in Pakistan for the period 2005-2014. Their study emphasized on the effect of changes in reserve requirement on commercial banks' profitability and how it affects the return on equity and return on asset. They concluded that increase in reserve requirement have an inverse effect on banks profitability.

Using 715 banks from 95 countries in 2003, Pasiouras (2008) found empirical evidence on the impact of regulations and supervision approaches on banks' efficiency. The evidences were in favor of all three pillars of Basel II (minimum regulatory capital requirements, the supervisory review process, and market discipline through disclosure requirements) in that there is positive correlation between capital adequacy regulation, official supervisory power, and market discipline with bank technical efficiency.

Financial strength of the bank can be measured by the availability of capital. Banks can manage unforeseen losses if they have adequate capital reserves available with them. Adequacy of capital determines the financial soundness of the bank and lowers the chances of failure of the bank (Kumar and Thamilselvan, 2014). Bandara (2015) had also conducted a study in Sri Lanka and discovered that there exists a direct relation between the capital adequacy ratio and return on equity but there is no relation between adequacy of capital ratio and return on assets.

Pasiouras, Tanna & Zopounidis (2009) apply the stochastic frontier analysis methodology to a sample of 74 countries to study how regulatory practices affect cost and profit efficiency. They found that cost efficiency is improved by stricter capital requirements, market discipline, and supervisory power, and it is reduced by activity restrictions; profit efficiency is improved by market

discipline, enhanced supervisory power, and activity restrictions, and it is reduced by stricter capital requirements.

Chortareas, Girardone & Ventouri (2012) apply the data envelopment analysis technique to 22 EU countries to show the impact of regulatory and supervisory measures on efficiency. Efficiency is improved by tighter capital restrictions and more supervisory powers, but it is reduced by private sector monitoring and restrictions on bank activities. In the same way, Barth et al. (2013) apply the data envelopment analysis technique on a sample of 74 countries. The authors illustrate the positive effect of capital regulation stringency, stronger official supervisory powers (in countries with supervision independence), financial transparency, and supervisory independence and experience. On the other hand, restrictions on bank activities lower operating efficiency.

Capital requirements play an important role in the supervision and regulation of commercial banks. Different studies have revealed the importance of minimum capital to make profits since meeting the minimum capital reduces the chances of bank distress so long as banks will not be pressured by short-term borrowing at high cost. So, capital acts as the cushion that will protect banks, its customers, and shareholders against possible losses from risks that banks are exposed to. Minimum capital requirement also enables banks to be competitive in the sector. Aderinokum (2004) indicated that an increase in the capital base of banks improve performance as it enables them to expand the scope of their activities within the industry, reduce risk, ensure quality asset management as well as puts banks in a strong liquidity position. Pasiouras et. al. (2009) found negative effect of capital regulation. They noted that, high capital requirement reduces the risk of the banks and this leads low profit and financial performance. Nguyen (2020) argues that adequately capitalized banks are able to undertake greater business expansion, finance large number of diverse transactions across sectors, allocate resources to be improved technologically as well as come up with innovative financial products to remain competitive.

Shaddady and Moore (2018) investigated the multifaceted effects of regulation together with supervision on bank stability using a large data set of an unbalanced panel of 2210 banks across 47 countries over the period 2000–2016. They applied CAMELS rating system to quantile regressions and found that greater capital regulation is positively associated with bank stability,

while tighter restrictions, deposit insurance and excess of supervision appear to exert an adverse effect on bank stability.

Abdulazeez (2014) investigated the financial performances of Saudi commercial banks during the period 2000-2013. The study used Panel data, Linear Multiple Regression model and Ordinary Least Squares to estimate the effect of capital adequacy, asset quality, operational efficiency, bank size, net loan to total deposits, liquid assets to total assets on financial performances. The study found that capital adequacy, operational efficiency, bank size, net loan to total deposits and liquid assets to total assets have positive and significant relationship with ROA but asset quality has negative and significant relationship with ROA. Similarly, capital adequacy, bank size and liquid assets to total assets have positive significant relationship with ROE, whereas net loan to total deposits has positive but insignificant relationship with ROE. Asset quality has negative and significant relationship and operational efficiency has negative but insignificant relationship with ROE. All the determinant variables except capital adequacy and operational efficiency of banks have positive significant relationship with NIM. Capital adequacy has positive but insignificant relationship with NIM and operational efficiency has negative but significant relationship with NIM.

Zardhoohi and Kolari (1994) tested the impact of branch network spread on performance of commercial banks in Finland and found that it led to improved access and convenience to banking services. Customers saved huge transport costs; this attracted more sales which resulted into bank profitability. Seale (2004) did an investigation involving spread in bank branches and its impact on banks performance in the US. The study adopted an event study approach to test the connection between bank branches and various financial ratios. The study found that extensive branch network was related to high non-interest income, low interest and non-interest expense, a higher return on equity among banks.

Firm size has been remarkably considered as an important determinant of firm profitability. (Kigen, 2014) determined that larger firms are said to be able to produce goods more cheaply as compared to small firms. This is because the former has achieved more learning, greater cumulative experience and they are able to spread their fixed costs over a greater amount of production. Spathis & kosimduo (2002) conducted study to investigate the effectiveness of large

and small Greek banks using ROE as a profitability measure and its relationship with some factors such as assets volume, liquidity and risk. The results of the study proved that; large banks are more efficient than small ones; small banks are characterized by high capital yield (ROE) while large banks are characterized by high asset yield (ROA). Redmond et al. (2007) studied about the effect of bank size on profitability. The ROE ratio is used as a measure of profitability, and found that, there is a negative significant relationship between profitability and the volume of assets. Raza, Jawaid and Shafqat (2013) also studied profitability of the banking sector in Pakistan. They used the panel data of 18 banks from 2001 to 2010. Dependent variable is bank profitability, while independent variables are bank size in terms of their assets, credit risk in terms of loan loss provisions to total loans, liquidity in terms of loans to total assets ratio, taxation, capitalization of banks, nontraditional activity of banks, banking sector development, stock market development and inflation. Results suggested negative and significant effect of bank size, credit risk, liquidity, taxation, and non-traditional activity with profitability.

Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion (Flamini et al., 2009). Rasidah (2011) explained the three external measures which reflect the macroeconomic conditions of the sample countries are inflation, GDP growth and interest rates. Thus, the three external variables are included as control variable in the study as they reflect the macroeconomic conditions of the country.

Anthanasoglou et. al. (2006) in their work investigated the effect of inflation on the profitability of banks, noting that the effect of inflation depends on whether it is anticipated or unanticipated. An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates so that it can increase revenues faster than costs and thus acquire higher profits. In contrast, the unanticipated inflation results improper adjustment of interest rates and hence the possibility that costs could increase faster than revenues. Consequently, there is a negative impact on bank profitability (Anthanasoglou et. al. 2006).

Economic growth, which is measured by the real annual GDP growth rate, is expected to impact profitability of banks positively. During periods of strong economic growth, the demand for loan and financial services tends to be higher, allowing banks to provide more loans, thereby increasing

the bank's cash flows and profits (Demirguc-kunt & Huizinga, 1999). Strong economic conditions are also characterized by low possibility of loan default. Thus, it is expected to have positive impact on performance (Belayneh, 2011).

Khan and Sattar (2014) studied "Impact of Interest Rate Changes on the Profitability of four Major Commercial Banks in Pakistan". In this research interest rate and bank profitability were used as explanatory and explained variables respectively. Pearson correlation model was used to conclude results. They concluded that a positive strong relationship exists between interest rate and bank profitability.

2.3.2. African Studies

Adebayo O. et al. (2011) assessed the effect of liquidity on profitability of commercial banks in Kenya for the period 2009 to 2013. The study employed a descriptive research design incorporating panel data obtained from the annual published financial statements which were analyzed using descriptive and inferential statistics. The findings of the study show that all liquidity has statistically significant and positive relationship with banks' profitability. Wambu (2013) also investigated the effect of liquidity on the financial performance of commercial banks in Kenya between 2008 and 2012. Liquidity coverage ratio and current ratio were as proxy for liquidity while return on equity for financial performance. The study shows a positive relationship between profitability and liquidity of commercial banks in Kenya. Kurawa and Abubakar (2014) on another study examined the effect of liquidity on profitability of Nigerian Banks for the period 2003-2012. The finding of the study revealed that there is positive relationship between liquidity and profitability of commercial banks in Nigeria.

Gudmundsson, Kisinguh & Odongo (2013) conducted a survey on the role of capital requirements on bank competition and stability. It was carried out over the period 2000 to 2011. They used the Lerner index as well as the Panzar and Rosse H-statistic to measure the level of competition in Kenya's banking industry. They also used ROE to measure bank performance and stability. They found that there is a positive relationship supporting the evidence that capital regulation does improve the performance of banks and financial stability.

Ejoh and Lovara (2014) assessed the effect of capital adequacy on deposit money banks' profitability in Nigeria for the period 1981-2011 on five selected banks. The study found out that capital adequacy plays a significant role in explaining banks' profitability. The study recommends that banks should be well capitalized to enable them enjoy access to cheaper sources of funds with subsequent improvement in profit levels which would help the public maintain confidence in the banks and also accommodate the credit needs of customers. Ikpefan (2015) also studied the effect of bank capital adequacy ratios, management and financial performance in the Nigerian commercial banks. The study revealed that capital adequacy ratio has positive effect on commercial banks' financial performance. The study recommends that regulatory authorities put in place measures to raise the level of capital adequacy ratio to avoid future bank collapse. Similar study conducted by Torbira and Zaagha (2016) revealed the existence of significant long run relationship between bank financial performance and capital adequacy in the Nigerian banking industry. They concluded that capital adequacy strongly and actively stimulates and improve the financial performance of banks in Nigeria.

Muiruri (2015) assess the effects of central bank regulatory requirements on financial performance of commercial banks in Kenya from 2009 to 2013. The study specifically focused on the effects of: corporate governance, capital requirement, liquidity management and credit risk management on financial performance of commercial banks. The study results indicated that there was a strong and positive correlation between effects of regulatory requirements and financial performance.

Abrahamane and Kargbo (2017) examine the moderating role of government regulation on bank risk and performance in Mali from 1998-2013, using Panel Least Square regression approach. The study reveals that banks risk appetite are higher in the event of lower capital adequacy requirement and thus affects their performance compared to when higher capital adequacy was in place. The weak positive return on assets (ROA) in the event of higher capital adequacy requirement indicated that banks in Mali maintained high capital ratios relative to an optimal level and thus erode banks performance.

Olivier and Mulyungi (2018) examine the effect of prudential regulations (assets quality, risk management, capital requirements, liquidity requirements) on financial performance of

commercial banks in Rwanda. The study results revealed that there is a positive relationship between prudential regulations and financial performance of commercial banks in Rwanda.

Adelowotan (2016) investigated the effect of branch network growth and bank's performance in Nigeria. The study took place in between 1981 and 2013 involving all the banks in Nigeria. The study utilized Ordinary Least Square (OLS). A pooled data analysis was adopted and the main study variables were as follows; number of bank branches in the study period and growth in total assets proxied as independent variable. Growth in bank branches was positively related to asset growth in rural, urban and foreign areas. In addition, with a main goal of establishing the link between spread in branch network and financial performance of commercial banks in Kenya, Nyatika (2017) adopted a correlation design to test the relationship between the variables for a period of 5 years from 2012-2016. The study recognized that spread in bank branch networks significantly predicts return on assets.

Mashamba, Magweva and Gumbo (2014) used Ordinary Least Squares (OLS) model to analyze the relationship between banks' deposit interest rate and deposit mobilization. Total commercial bank deposit is the dependent variable while average commercial banks deposit rate, development of the banking sector, interest rate spread, and economic growth rate are the independent variables. They found a positive relationship between deposit and deposit rate, GDP and financial deepening while deposits are negatively related to interest rate margins and inflation.

2.3.3. Local Studies

Eden (2014) examined the impact of National Bank regulation on the performance of private commercial banks using panel data from 2004 to 2013. She used NBE bill purchase requirement, credit cap and reserve requirement as indicator of National Bank regulation and she measured banks performance in terms of return on asset and net interest margin. The results of panel data regression analysis showed that NBE Bill and credit cap have negative and statistically significant impact on Return on Asset but reserve requirement has negative and insignificant impact on Return on Asset. On the other side three of the regulatory variables (i.e., NBE Bills, Reserve requirement and credit cap) have negative and statistically significant effect on net interest margin. On the same year other studies (Shibiru, (2014), Tesfaye (2014) and, Memru (2014)) were conducted to assess the effect of NBE bills purchase directive on the profitability of private commercial banks in

Ethiopia. The studies indicated that bills purchase directive of NBE is negatively reflected on almost all private commercial banks' performances.

Nahom (2015) studied determinants of performance of private commercial banks in Ethiopia by classifying independent variables into bank specific factors (capital adequacy, liquidity and asset quality) and macroeconomic factor (real GDP growth rate, annual inflation rate, internal rate, NBE bill purchase). Return on equity and net interest margin were used as dependent variables to measure banks performance. He concluded that capital adequacy from banks specific factors and NBE bill purchase from macroeconomic factors was the major determinate of bank performance as measured by return on equity. And liquidity, real GDP growth rate, annual inflation rate and NBE bill purchase are the major determinants of banks performance as measured by net interest margin. Dakito (2015) also conducted a study to see the relation between capital adequacy and banks' financial performance for the period of 2000-2013. The study finding shows that there exists positive relationship between capital adequacy and banks' financial performance.

Addisu (2017) examined the effect of bank regulation on the profitability of private commercial Banks in Ethiopia. The study used 11 years data from seven selected commercial Banks in Ethiopia. The dependent variables used to measure banks profitability was return on asset. Whereas, equity investment, legal reserve requirement and capital requirement were used to proxy bank regulations. The result obtained from the regression model indicated that: capital requirement and bank size have a positive and significant effect on profitability of private commercial banks; capital adequacy and reserve requirement have negative and significant effect on profitability; equity investment has negative but insignificant effect on profitability of private commercial banks in Ethiopia.

Recently Fanos (2020) used multiple linear regressions models to investigate the effect of bank regulations on profitability and liquidity of private commercial banks in Ethiopia between 2008 and 2017. In the study, return on equity and ratio of current asset to current liability were used to measure profitability and liquidity respectively. In addition, the researcher used equity investment, legal reserve requirement, capital requirement, capital adequacy, management efficiency and NBE bill purchase requirement as independent variable. The regression result showed that capital adequacy and management efficiency have negative and significant effect on profitability of

private commercial banks and the remaining regulatory variables: legal reserve requirement, capital requirement, NBE Bill Purchase and equity investment have insignificant effect on profitability of private commercial banks. On the other side, legal reserve requirement has positive and significant effect on liquidity of private commercial banks in Ethiopia. NBE Bill Purchase and equity investment have positive and insignificant effect on liquidity of private commercial banks in Ethiopia. The remaining two regulatory variables capital adequacy and capital requirement have negative and insignificant effect on liquidity of private commercial banks.

Tekalegn (2020) examined the effect of National Bank of Ethiopia's prudential regulations on private commercial banks financial performance. He used balanced fixed effect panel regression model for the data of ten private commercial banks between 2009 to 2018. He measured banks financial performance in terms of return on equity and the results of panel data regression analysis showed that capital adequacy ratio and bank size have negative and statistically significant effect on banks profitability, while lending interest rate and liquidity requirement ratio have positive and significant effect on profitability.

2.4. Summary and Research Gaps

Different studies have been conducted on bank regulation and financial performance. In order to understand the studies properly, they are divided into three categories (Global, Africa and Ethiopia). The summary of the studies is presented as follows:

Most studies [whitehead (1997), Aderinokun (2004), Pasiouras (2008), Pasioura et al. (2009), Chortareas et al (2012), Gudmundsson (2013), Abdulazeez (2014), Ejon & Iwara (2014), Ikpefan (2015), Kumar & Thamilselvan (2014), Bandara (2015), Nahom (2015), Torbirra & Zaagha (2016), Kargbo et al. (2017), Adissu (2017), and Shaddady & Moore (2018)] show that capital requirements have a positive relationship with banks profitability. The reason for this positive relationship is that banks with lots of capital are assumed to absorb unexpected shock. In addition, an increased minimum capital requirement enables new banks to compete with existing ones. Studies, on the other hand, indicate that reserve requirement has negative relationship with banks profitability [Punita & Somayia (2006), Eden (2014), S. Fatima Abid & Lodhi (2015), and Adissu (2017)]. The reason for this is that it is assumed that the banks would have made a better profit if they had invested the money in the reserve account to meet the reserve requirement. Studies on

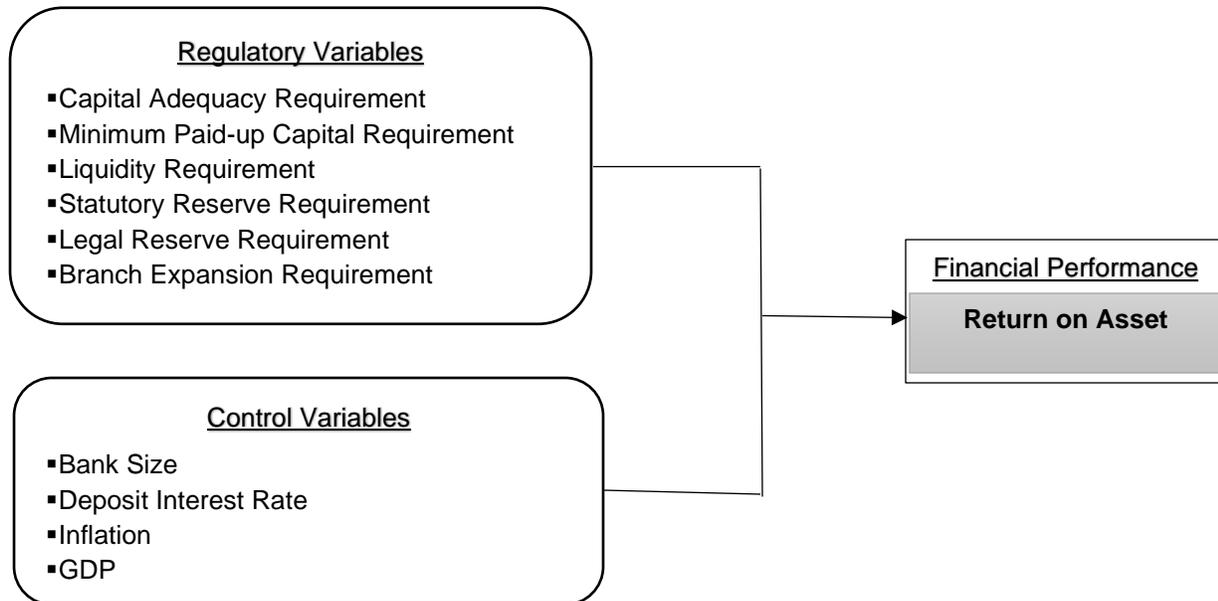
liquidity requirement [Adebayo et al. (2011), Wambu (2013), Kurawa & Abubakar (2014), Nahom (2015), and Tekalegn (2020)] show that liquidity increases the profitability of banks. This is because banks with high liquidity risk (low liquidity) commonly lack stable and cheap funding, and therefore may be forced to borrow from the capital markets at a higher interest rate. In addition, existing studies [Zardhoohi & Kolari (1994), Seale (2004), Adelowotan (2016), and Nyatika (2017)] show that branch growth has a positive effect on the bank's profitability in terms of increasing access to banking services and increasing deposit mobilization.

Studies conducted at global and African level have focused on various regulatory variables (Such as capital adequacy, capital requirement, reserve requirement, and liquidity requirement). When we come to studies in Ethiopia, the main focus was on private commercial banks and limited to a few regulatory variables, especially the NBE bill purchase requirement. The NBE bill purchase requirement, which has been the focus of much of the debate, was a temporary regulation issued by the government to support the implementation of the already gone GTPs. Presently, the requirement has been expelled by the NBE. The following research gaps are identified from the extant literatures. First, there are some important regulatory variables (such as legal reserve requirement and policy involvements (requirement to branch expansion)) that have not been addressed in studies so far. As mentioned earlier, most of the studies commonly focused on a few regulatory variables mainly NBE bill purchase requirement. Furthermore, there is imprecise view between measurement of statutory reserve requirement and legal reserve requirement. Another identified gap is lack of adequate studies that shows the combined effect of regulatory variables that lasts for longer time. Most of the previously undertaken studies deal with limited regulatory variables. However, studying one or two regulatory variables alone does not enable to fully understand the effect of bank regulation on financial performance so long as the variables are applied jointly to the banks. The other research gap is the omission of the state-owned commercial bank from the concern of previous studies. Excluding the state-owned commercial bank (CBE), the largest bank that accounts for two-thirds of the country's total commercial banks, will prevent us from understanding the effect of bank regulation on financial performance.

2.5. Conceptual Framework

The following is a schematic diagram that maps out how the study variables are related one another.

Figure - 2.1. Conceptual Framework



Source: The researcher's own construct based on literature review, 2021

CHAPTER-3

RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the research design and methodology which is used in testing relationship between banks regulation and financial performance of commercial banks in Ethiopia. Elements discussed include; research design, research approach, population and sampling procedure, data collection and data analysis, model construction, and measurement of variables.

3.2. Research Design

This study is designed to be explanatory since the objective of the study is measuring the effects of bank regulation on financial performance of commercial banks in Ethiopia. In other words, the study establishes cause-and-effect relationship between bank regulation and financial performance. Explanatory research tests hypotheses and is designed to explain “why” something happened, i.e., to show cause and effect relationships (Greener & Martelli, 2018).

3.3. Research Approach

The three common approaches to conduct research are quantitative, qualitative, and mixed methods (Greener & Martelli, 2018). This study follows the quantitative approach since it is found better to establish relationship between the study variables (i.e., bank regulation and financial performance) that are expressed in terms of percentages.

3.4. Population and Sampling Procedure

Currently, the banking ecosystem in Ethiopia consists of a total of 18 banks (NBE annual report 2019/2020). Out of the 18 banks, 17 of them are commercial banks and one i.e., Development Bank of Ethiopia (DBE) is a specialized state-owned development financial institution. Among the 17 commercial banks, Commercial Bank of Ethiopia (CBE) is state owned and the remaining 16 are private commercial banks (NBE Annual report, 2019/2020).

The target population of the study includes all the seventeen commercial banks that operate in Ethiopia. Out of the seventeen targeted banks, only one commercial bank (Enat Bank) is excluded in the study. This is because data required for the study regarding the bank could not be obtained

in sufficient amount since the bank was established three years after 2010. Therefore, purposive sampling is used to select the samples from the total population.

3.5. Data Collection, Presentation and Analysis Techniques

3.5.1. Data Type, Source, and Method of Collection

The study uses only secondary data that are observed along time series of 10 years (2010-2019) for the 16 commercial banks. This study, therefore, has used panel data that contains both time series and cross-sectional dimensions. Panel data is preferred because it helps to investigate causal relationship between variables along time series. First, we can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time series or pure cross-sectional data alone. Second, by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of hypothesis test. Third, panel data helps to mitigate problems of multicollinearity that may arise if time series are modelled individually. In addition, by structuring the model in an appropriate way, we can remove the impact of certain forms of omitted variables bias in regression results (Brooks, 2019, p. 626-627).

The data are collected from annual reports of National Bank of Ethiopia as well as from the individual commercial banks audited financial statements in their website. The variables used in this study are obtained from the various directives of the NBE. Furthermore, a careful monitoring of national policy papers related to economic growth and bank sector development were made. A case in point in such regard is the Growth and Transformation Plan I and II that clearly addressed the growth mode of the economy as well as the expected contribution of banks to the development endeavor.

3.5.2. Method of Data Analysis and Presentation

An Ordinary Least Squares (OLS) regression is used to estimate equation of the model and in order to achieve this, a software package of E-views 10 is used. OLS is preferred because it remains the most popular technique for estimating regressions for the following reasons: First, using OLS is easier than alternatives since it does not require more mathematical sophistication and computing power. Second, OLS is assumed to be Best Linear Unbiased Estimator (BLUE) (Pedace, 2013, p. 76). The study analysis is based on coefficients of the variables and their probability values

obtained from the regression result. In addition, descriptive statistics (mean, median, maximum, minimum, standard deviation, and coefficient of variation) is used in the data analysis. In this study 5% is taken as the level of statistical significance, i.e., the level of risk that we would say the variables are related when in fact they were not related. It is usual to say that the maximum level of 0.05 is acceptable (i.e., $p < 0.05$). This suggests that in no more than 5 cases out of 100, will we be wrong (i.e., suggest a relationship which is not there) – the same as saying we have 95% certainty that the relationship is correct (Greener & Martelli, 2018, p. 93).

Regarding the presentation of data analysis, first descriptive statistics of both dependent and independent variables is presented. Then, test for the assumption of Classical Linear Regression Model (OLS assumptions) is employed. Finally, discussion for the results of the regression analysis is exhibited.

3.6. Model Construction

The hypotheses are tested through the following model that establishes a linear relationship between regulatory variables and bank performance.

$$ROA_{it} = \alpha + \beta_1 CAR_{it} + \beta_2 MPCR_{it} + \beta_3 LR_{it} + \beta_4 SRR_{it} + \beta_5 LRR_{it} + \beta_6 BER_{it} + \beta_7 BS_{it} + \beta_8 INF_{it} + \beta_9 DIR_{it} + \beta_{10} GDP_{it} + \varepsilon_{it}$$

3.7. Measurement and Operational Definition of Variables

The operational definition and measurement of dependent and independent variables are presented under this section.

3.7.1. Dependent Variables

- ***Return on Asset (ROA):*** ROA is a ratio of net income after tax to the average of the current and preceding year total asset (Khrawish, 2011). It measures profitability by revealing how much income is generated by a bank using the total asset of the bank. In other words, ROA shows how efficiently the resources of the bank are used to generate income.

3.7.2. Independent Variables

- ***Capital Adequacy Requirement (CAR):*** CAR represents the amount of equity that banks are required to hold against risky assets in order to protect the depositors from any

unexpected loss. It is expressed as the ratio of total equity to total asset. NBE *Directives No. SBB/78/2021* states that the minimum capital adequacy ratio which all licensed banks shall maintain at all times is 8%.

- **Minimum Paid-up Capital Requirement (MPCR):** MPCR refers to the minimum amount of paid in cash capital required by NBE. It is measured as annual change in amount of paid-up capital of a given bank. The NBE *Directives No. SBB/78/2021* states that the minimum paid-up capital required to obtain a banking business license shall be **Birr 5 billion**, which shall be fully paid in cash.
- **Liquidity Requirement (LR):** LR specifies the required ratio of banks' current assets to current liabilities with an objective of keeping banks liquid at all times. With regard to liquidity requirements, National Bank of Ethiopia (NBE) issue a directive (Liquidity Requirement (5th Replacement) *Directives No. SBB/57/2014*) that requires any licensed commercial bank to maintain liquid assets of not less than **15%** of its net current liabilities.
- **Statutory Reserve Requirement (SRR):** SRR represents the minimal percentage of deposits to be kept up with reserve account in NBE. It is measured by the ratio of banks' reserve account in NBE to deposit. The NBE Reserve Requirement – 6th Replacement *Directive No. SBB/55/2013* requires any bank operating in Ethiopia to maintain in its reserve account **5%** of all Birr and foreign currency deposit liabilities held in the form of demand (current) deposits, saving deposits and time deposits.
- **Legal Reserve Requirement (LRR):** LRR refers to the portion of banks net income that is required to be transferred to legal reserve account in NBE. Legal reserve is an equity account and its cumulative is reported in the banks' balance sheet. It is measured in terms of the ratio of legal reserve amount to total asset (Punita and Somaiya, 2006). The NBE issued *Directives No. SBB/4/95* that demand every bank, after fulfilling the initial minimum capital, to transfer **25%** of its annual net profit to its legal reserve account until such account equals its capital. When the legal reserve account equals the capital of the bank, the amount to be transferred to the legal reserve account shall be **10%** of the annual net profit.
- **Branch Expansion Requirement (BER):** BER represents the rate at which banks are required to increase their branches annually. The Ethiopian government has pursued several policies that encourage banks to expand their branch. Based on this, NBE moral

suasion that follows the issuance of the GTPs has placed a **25%** annual increment in branch network as an important policy direction to be followed by commercial banks.

3.7.3. *Control Variables*

- **Bank Size (BS):** Bank size represents the ownership of assets by banks and measured by natural logarithm of banks' total asset (Spathis & kosimduo, 2002). It is generally used to capture potential economies or diseconomies of scale in the banking sector.
- **Inflation (INF):** Inflation is a quantitative estimate of the rate at which purchasing power currency declines (Anthanasoglou et. al., 2006). It is measured in terms of the annual inflation rate of the country and its value is obtained from the annual reports of NBE.
- **Deposit Interest Rate (DIR):** In Ethiopian banking system, there are three types of deposit namely: saving deposit, time deposit and current deposit (NBE annual report 2019/2020). Except current deposit the remaining two pays interest to depositors. DIR is measured in terms of weighted average rate of time deposit and saving deposit interest rates. The average value of time deposit and saving deposit for each year is extracted from NBE annual reports.
- **Gross Domestic Product:** Gross domestic product (GDP) is the standard measure of the value of final goods and services produced by a country during a period (OECD, 2009). GDP growth changes in the size of economies are usually measured by changes in the volume often referred to as real of GDP. Real reflects the fact that changes in GDP due to inflation are removed (OECD, 2009). The GDP values for different years are extracted from NBE annual reports.

Table – 3.1. Variable Measurements and Operational Definitions.

Variables		Measurement	Operational Definitions
Dependent Variable	Return on Asset (ROA)	$\frac{\text{Net Income After Tax}}{\text{Average Total Assets}} \times 100$	ROA is the ratio of net income to average total asset. It shows how efficiently the resources of the bank are used to generate income.
Independent Variables	1. Capital Adequacy Requirement (CAR)	$\frac{\text{Capital}}{\text{Total Asset}} \times 100$	The portion of banks asset to be held in the form of capital so as to absorb unexpected shocks.
	2. Minimum Paid-up Capital Requirement (MPCR)	$\frac{\text{Current year paid up capital} - \text{Previous year paid up capital}}{\text{Previous year paid up capital}}$	Annual percentage growth of paid-up capital.
	3. Liquidity Requirement (LR)	$\frac{\text{Total Current Asset}}{\text{Total Current Liabilities}} \times 100$	Liquid assets as percentage of liquid liabilities.
	4. Statutory Reserve Requirement (SRR)	$\frac{\text{Reserve Account with NBE}}{\text{Deposits}} \times 100$	Reserve requirement as percentage of deposit.
	5. Legal Reserve Requirement (LRR)	$\frac{\text{Legal reserves}}{\text{Total Asset}} \times 100$	The portion of net income transferred to legal reserve account.
	6. Branch Expansion Requirement (BER)	Annual branch growth rate in %	Bank's branch growth per annum.
Control Variables	1. Bank Size (BS)	$\ln(\text{Total Asset})$	Bank size represents the ownership of assets by banks.
	2. Inflation (INF)	Annual inflation rate in %.	Quantitative estimate of the rate at which the decline in purchasing power of Birr.
	3. Deposit Interest Rate (DIR)	$\frac{\text{Average time deposit} + \text{Saving deposit}}{2}$	DIR, is the weighted average of time deposit interest rate and saving deposit interest rate.
	4. GDP	Real GDP growth rate in %.	Measure of economic growth of a country.

Source: Compiled by the researcher, 2021.

CHAPTER-4

RESULTS AND DISCUSSION

4.1. Introduction

This chapter is about data presentation, analysis, and interpretation. It is presented in four sections. The first section provides analysis on descriptive statistics of the dependent and independent variables. Then, tests made to ascertain the fulfillment of assumptions of CLRM are presented in the second section. The third section provides test made to choose the appropriate panel estimator approach to the study. Finally, discussions for the results of the regression analysis are presented under section four.

4.2. Descriptive Statistics of the Data

The descriptive statistics for the dependent and independent variables are presented below. The dependent variable is banks financial performance proxied by ROA. The independent variables are bank regulatory variables (capital adequacy requirement, minimum paid-up capital requirement, liquidity requirement, statutory reserve requirement, legal reserve requirement, and bank branch expansion requirement) and control variables (bank size, inflation, deposit interest rate, and GDP).

Table – 4.1. Descriptive Statistics of Variables

	ROA	CAR	MPCR	LR	SRR	LRR	BER	BS	INF	DIR	GDP
Mean	2.86	14.67	29.45	45.03	12.78	2.34	30.34	22.93	12.86	6.50	9.60
Median	2.94	13.98	23.73	40.51	10.55	2.31	24.47	23.01	11.15	6.40	10.00
Maximum	6.72	38.24	424.28	118.35	45.22	4.79	188.88	27.29	34.10	7.61	11.40
Minimum	-2.21	0.00	-5.60	5.92	0.00	0.00	0.00	19.61	2.80	5.46	7.70
Std. Dev.	1.14	5.64	38.08	21.21	9.14	1.13	26.11	1.46	8.22	0.68	1.14
CV	0.40	0.38	1.29	0.47	0.71	0.48	0.86	0.06	0.64	0.10	0.12
Observation	154	154	147	154	154	154	134	154	160	160	160

Source: NBE and annual audited report of commercial banks computed via EViews-10.

Standard deviations are indicators of how spread-out data around the mean. Since there is no clear cutoff point, it is very difficult to say whether the value of a given standard deviation is good or bad. Rather it is important to see coefficient of variation (CV) which is expressed as fraction of standard deviation and mean. As a rule of thumb, distributions with a coefficient of variation higher

than 1 are considered to be high variance whereas those with a CV lower than 1 are considered to be low-variance (Kaufmann, 2014). Therefore, the rule of thumb is assumed throughout the discussion of the descriptive statistics results.

As the descriptive result indicates, ROA of the commercial banks ranged from -2.21 to 6.72 with a standard deviation value of 1.14% and 0.4 coefficient of variation. This indicates that commercial banks in Ethiopia have enjoyed a stable profit during those periods of 2010-2019. Hence, the ROA is comparable among the commercial banks.

The average capital adequacy ratio of the banks during the study period was 14.67% and it is far more than the 8% requirement placed by NBE Directive No. SBB/50/2011. From the results of the descriptive statistics, it is noted that during the study period the commercial banks operated with adequate capital. The capital adequacy ratio of the banks deviate at 5.64% from the mean value with a coefficient of variation (0.38). These indicate that capital to asset ratio is proportional and stable across the banks.

During the study period, the paid-up capital of the commercial banks annually grew at rate of 29.45%. The value of the coefficient of variation (1.29) is greater than 1 and this implies the commercial banks endeavor towards achieving the minimum paid-up capital requirements vary from bank to bank.

Regarding liquidity requirement, on average the commercial banks maintained 45% liquidity ratio over the 10 years. The mean value is above the NBE requirements placed at different times that are 20% (Directive No. SBB/46/2012) and 15% (Directives No. SBB/57/2014). The values of the standard deviation (21.21%) and coefficient of variation (0.47) show liquidity is relatively stable among the commercial banks.

The other regulatory measure used by the NBE to control inflation pressure as well as money circulation in the banking system is the statutory reserve requirement. The requirement was revised twice during the study period. First, in 2012 the NBE decreased the reserve requirement from 15% to 10% (Directive No. SBB/46/2012) following the success in getting down the inflation in the country. As the inflation pressure is getting down the NBE further revised the reserve requirement downwards to 5% in 2013 (Directive No. SBB/55/2013). The average reserve requirement during

the study period was 12.78% and it is above the requirements in both cases. In addition, as the descriptive statistics indicates there is a notable insignificant variation since the value of coefficient of variation (0.71) is closer to 1.

Legal reserve requirement is the other regulatory variable of the study through which the NBE demands every commercial bank to transfer 25% of its annual net profit to its legal reserve account until such account equals its capital. When the legal reserve account equals the capital of the bank, the amount to be transferred to the legal reserve account shall be 10% of the annual net profit (Directives No. SBB/4/95). From the results of the descriptive statistics, it is noted that the legal reserve of a given commercial bank on average accounts 2.34% of the total asset of the bank. No commercial bank started to transfer 10% of net income to the legal reserve account and this implies it takes longer time for the banks to make legal reserve account equal with capital. This may be due to the fact that minimum paid-up capital was revised three times during the study period and this instigated the banks to continue transferring 25% of their annual net profit to the reserve account.

Branch expansion is the other policy and regulatory measure directing the growth mode of banks. NBE moral suasion that follows the issuance of the GTPs has placed a 25% annual increment in branch network as an important policy direction to be followed by commercial banks. The commercial banks on average had been increasing their branch network by 30.34% which is superior than what has been set in the policy. However, the standard deviation of 26.11% and the coefficient of variation (0.86) which is near closer to 1 reflect the presence of branch growth variation among the banks.

The remaining variables were control variables that were assumed to have effect on financial performance of the commercial banks. The first control variable is inflation and the average value of inflation of the country over the 10 years was 12.86%. The maximum inflation was recorded in 2012 (i.e., 34.1%) and the minimum was in the year 2010 (i.e., 2.8%). However, the value of standard deviation and coefficient of variation remained 8.22% and 0.64 respectively. This indicates that the rate of inflation was relatively stable over the study periods. The other control variable of the study is GDP with an average rate of 9.6%. It indicates that the average real growth rate of the country's during the study period was 9.6%. The maximum growth of the economy was

recorded in the year 2011 (i.e., 11.8%) and the minimum was in the year 2018 (i.e., 7.7%). The mean value of the deposit interest rate, the other control variable, over the study period was 6.50%. From the results of the descriptive statistics, it is noted that there was little variation of interest rate among the banks since the value of the standard deviation (0.68%) and coefficient of variation (0.1) are so small.

4.3. Diagnostic Test for Assumptions of CLRM

When deciding whether OLS is the best technique for a given estimation, assumptions of CLRM must be met (Pedace, 2013). The assumptions of the CLRM are required to show that the estimation technique, ordinary least squares (OLS), had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted (Brooks, 2019, p. 179). In the study the following assumptions are tested to determine whether OLS is the best estimation technique or not.

4.3.1. Assumption-1: $E(u_t) = 0$ (The sum of error term is zero)

The first assumption states that the average value of the errors is zero for any given value of independent variable(s). The error term is the difference between the actual value of the dependent variable and the value from the population regression function (Brooks, 2019). In fact, if a constant term is included in the regression equation, this assumption will never be violated (Brooks, 2019). Therefore, since the constant term α is included in the regression equation, the average value of the error term in this study is zero.

4.3.2. Assumption-2: $Var(u_t) = \sigma^2 < \infty$ (Error term has a constant variance)

The CLRM also relies on assumption that requires constant variance of the error term. This is known as the assumption of homoscedasticity. According to Brooks (2019), homoskedasticity refers to a situation in which the error terms have the same variance regardless of the value(s) taken by the independent variable(s). On the contrary, heteroscedasticity means unequal scatter of residuals and it occurs when the variance of the error term changes in response to a change in the value(s) of the independent variable(s). If the error term is heteroskedastic, the dispersion changes over the range of observations.

To test the assumption, white test is used and, in the test, both F-statistic and chi-square (χ^2) tests statistic are used. Since the p-values in both F-statistic and χ^2 -test are greater than 0.05 (insignificant), there is no evidence for the presence of heteroscedasticity.

Table – 4.2. Heteroscedasticity Test

Heteroskedasticity Test: White

F-statistic	1.697937	Prob. F(10,123)	0.0884
Obs*R-squared	16.25408	Prob. Chi-Square(10)	0.0926
Scaled explained SS	23.98796	Prob. Chi-Square(10)	0.0076

Source: NBE and annual audited report of commercial banks computed via EViews-10.

4.3.3. Assumption-3: $Cov(u_i, u_j) = 0$ (Correlation of error observations is zero)

The third assumption that is made of the CLRM is that the covariance between the error terms over time (or cross-sectionally, for that type of data) is zero. In other words, observations are assumed to be randomly drawn, so the error values should be independent and not related to one another (Brooks, 2019). If the error terms of consecutive observations have a relationship, autocorrelation (or serial correlation) happens.

The test for autocorrelation was made by using Breusch-Godfrey Serial Correlation LM Test. Breusch-Godfrey Serial Correlation LM Test is more general than the DW test, and can be applied in a wider variety of circumstances since it does not impose the DW restrictions on the format of the first stage regression (Brooks, 2019). The probability value of both F-statistic and χ^2 -test were above 0.05 (insignificant) and these give the same conclusion in that there is no evidence for the presence of autocorrelation.

Table – 4.3. Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.681617	Prob. F(6,117)	0.1315
Obs*R-squared	10.63831	Prob. Chi-Square(6)	0.1002

Source: NBE and annual audited report of commercial banks computed via EViews-10.

4.3.4. Assumption-4: $Cov(u_t, x_t) = 0$ (Imperfect linear relationships among the independent variables)

Multicollinearity arises when there is high linear relationship between two or more independent variables in a regression model (Pedace, 2013). It affects the coefficients and p-values, but it does not influence the predictions, precision of the predictions, and the goodness-of-fit statistics (Brooks, 2019). The general rule of thumb to test for the presence of multicollinearity is that if correlation coefficient between two variables is greater than 0.8, the multicollinearity is a serious problem and causes substantial problem for a regression analysis (Senaviratna & A. Cooray, 2019). The table below shows the correlation result for all the independent and control variables in this research. All correlation results are below 0.8 with the maximum value of 0.68 between SRR and LR. Therefore, multicollinearity is not a problem for this study.

Table – 4.4. Correlation Matrix of Explanatory Variables

	CAR	MPCR	LR	SRR	LRR	BER
CAR	1.000000	-0.009410	0.519863	0.246527	-0.028372	0.322546
MPCR	-0.009410	1.000000	-0.018950	-0.061074	-0.228528	-0.030045
LR	0.519863	-0.018950	1.000000	0.683733	-0.172476	0.206952
SRR	0.246527	-0.061074	0.683733	1.000000	-0.081279	0.154832
LRR	-0.028372	-0.228528	-0.172476	-0.081279	1.000000	-0.315154
BER	0.322546	-0.030045	0.206952	0.154832	-0.315154	1.000000

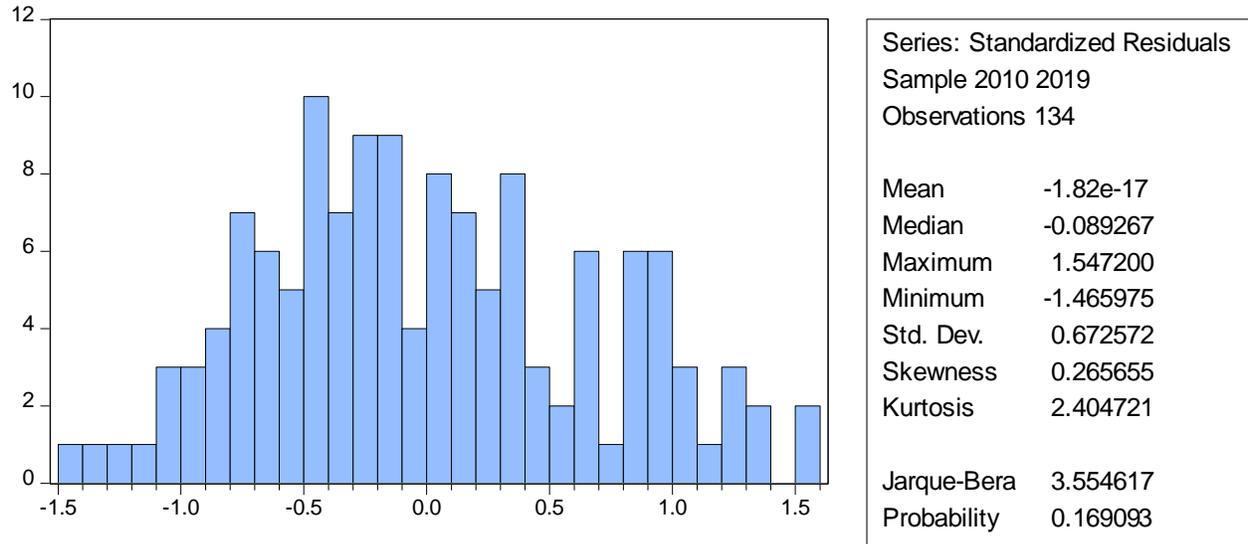
Source: NBE and annual audited report of commercial banks computed via EViews-10.

4.3.5. Assumption-5: $u_t \sim N(0, \sigma^2)$ (The disturbances are normally distributed)

The last assumption states that the error terms have normal distribution. If the residuals are not normally distributed, then the dependent variable or at least one explanatory variable may have the wrong functional form, or important variables may be missing (Brooks, 2019).

Jarque-Bera is used to test for normality. As shown in the histogram, the probability value of the Jarque-Bera (16.9%) is not significant even at 10% level of significance. Hence, the null hypothesis that states residuals follow normal distribution should not be rejected. In other words, the error term follows normal distribution.

Figure – 4.1. Normal Distribution Test



Source: NBE and annual audited report of commercial banks computed via EViews-10.

4.4. Choosing Between Random Effect Model Versus Fixed Effect Model

There are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models and random effects models (Brooks, 2019). The choice between the approaches is determined with Hausman Test. The null hypothesis for the test states that random-effects model is appropriate. As shown in Table 4.5, the Hausman Test for this study resulted p-value of 0.0001 which is quite significant to reject the null hypothesis. So, it can be concluded that the fixed effects model is an appropriate model for the relationship established by this study.

Table – 4.5. Hausman Test

Correlated Random Effects - Hausman Test
Equation: EQROA
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	35.043833	10	0.0001

** WARNING: estimated cross-section random effects variance is zero.

Source: NBE and annual audited report of commercial banks computed via EViews-10.

4.5. Discussion of the Regression Results

Table – 4.6. Regression Output

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 05/30/21 Time: 12:05
 Sample: 2010 2019
 Periods included: 10
 Cross-sections included: 16
 Total panel (unbalanced) observations: 134

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.457557	4.101544	1.330610	0.1861
CAR	-0.070158	0.026117	-2.686328	0.0084
MPCR	0.028283	0.010585	2.671937	0.0087
LR	0.012783	0.006102	2.094683	0.0385
SRR	0.001587	0.001691	0.938143	0.3503
LRR	0.694148	0.109308	6.350366	0.0000
BER	-0.003634	0.002136	-1.701704	0.0917
BS	-0.179223	0.146346	-1.224654	0.2234
INF	0.023072	0.008798	2.622287	0.0100
DIR	-0.169128	0.079499	-2.127413	0.0357
GDP	0.100588	0.049738	2.022342	0.0456

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.778457	Mean dependent var	4.268241
Adjusted R-squared	0.699702	S.D. dependent var	2.753458
S.E. of regression	0.766942	Akaike info criterion	2.479539
Sum squared resid	63.52556	Schwarz criterion	3.041807
Log likelihood	-140.1291	Hannan-Quinn criter.	2.708027
F-statistic	4.271190	Durbin-Watson stat	1.676381
Prob(F-statistic)	0.000000		

Source: NBE and annual audited report of commercial banks computed via EViews-10.

The measure of fit most commonly used with OLS regression is the coefficient of determination, which is more commonly known as R-squared. R-squared measures the proportion of variation in the dependent variable that's explained by variation in the independent variables (Brooks, 2019). Adjusted R-squared of the model is around 70% which implies that 70% changes in ROA of the commercial banks are explained by the changes in the independent variables.

Probability of F-statistic is important to comment on the overall significance of all independent variables in determining the value of dependent variable (Aljandali & Tatahi, 2018). In other words, it tells us the combined effect of explanatory variables on the dependent variable. If the Prob (F-statistic) is equal or smaller than 0.05, we can say that all the variables in the model jointly

affect the dependent variable at 5% significance level. In this model the value of Prob (F-statistic) is 0.0000 which is quite lower than 0.05. We can conclude from the result that all the independent variables (capital adequacy requirement, minimum paid-up capital requirement, liquidity requirement, statutory reserve requirement, legal reserve requirement, branch expansion requirement, bank size, inflation, deposit interest rate, and GDP) jointly have a significant effect on ROA even at 1% significance level.

Capital Adequacy Requirement and Financial Performance

Result of the study with respect to CAR and financial performance is similar to the results of empirical studies of Addisu (2017), Fanos (2020), and Tekalign (2020). However, it is in contrary to the findings of Abdulazeez (2014), Ikpefan (2015), and Abdrahamane and Kargbo (2017). As the regression output indicates, the coefficient of Capital Adequacy Ratio is (-0.07) and this is interpreted as keeping other variables of the study constant, when CAR increases by 1%, ROA decreases by 7%. Although the direction of relationship between ROA & CAR is contrary to prediction of the study, the relationship between CAR and ROA remains significant. The negative relationship between ROA and CAR can be interpreted as, the profit of commercial banks decreases when the amount of capital from the total assets that the commercial banks hold increases. This indicates that the main source of income for commercial banks in Ethiopia is the money they obtained from depositors since liabilities are a cheaper source of finance than equity.

Minimum Paid-up Capital Requirement and Financial Performance

Finding of the study regarding minimum paid-up capital requirement is in line to the result of previous studies: Nguyen (2020), Addisu (2017), Fanos (2020), and Tekalign (2020). The estimated value for the coefficient of Minimum Paid-up Capital Requirement is 0.028 which is interpreted as holding other variables in the model constant if MPCR increase by 1%, ROA will increase by 2.8%. Likewise of the CAR, the MPCR was expected to have a significant positive impact on the profitability of banks and from the regression output it is noted that rise in minimum paid-up capital has a positive and statistically significant relationship with ROA. The relationship has been due to the opportunity from a capital increase in creating reliable liquidity standing for banks. In addition, the various regulations issued by NBE indicate that banks have a wide range of time limits to raise for the amount of paid-up capital. The NBE has amended directive of

minimum paid-up capital requirements twice since 2011 (i.e., Directive No. SBB/50/2011 in 2011 and Directive No. SBB/78/2021 in 2021). In both cases NBE allowed commercial banks to increase their paid-up capital to the said amount within 5 years which indicate that banks have a wide range of time limits to raise for the amount of paid-up capital.

Liquidity Requirement and Financial Performance

The study result with respect to liquidity requirement support previous studies of Adebayo O. et al. (2011), Wambu (2013), and Kurawa and Abubakar (2014). The study predicted that when banks are liquid, they will have more money to borrow and thus their profitability will increase. Finding of the study confirmed the prediction in that liquidity requirement has established a positive and significant relationship with ROA. The coefficient of Liquidity Requirement from the regression output is found to be 0.012 which is interpreted as keeping other variables in the study constant, 1% increase in LR results a 1.2% increment of ROA.

Statutory Reserve Requirement and Financial Performance

Statutory Reserve requirement is the other variable of the study that serve as instrument of prudential regulation as well as tool of monetary policy. Finding of the study with respect to statutory reserve requirement is in contrary to the result of empirical studies; Eden (2014), Addisu (2017), Fanos (2020), and Tekalign (2020). From the regression output it is noted that SRR has a positive but insignificant effect on the financial performance of commercial banks. The relationship result however is in contrary to the study's prediction since SRR was considered to reduce loanable fund of commercial banks through imposing the banks to put a portion of depositors money into a non-interest-bearing reserve account. The result may be due to the fact that NBE has mostly kept this regulatory variable at a constant and lower rate (i.e., 5%). Following the success in getting down the inflation in the country, the NBE revised the reserve requirement only once in 2013 and since the requirement remain at 5% (2013 (Directive No. SBB/55/2013)). In addition, the excess liquidity standing of the banks has not exposed them to feel the pain from high reserve holding requirements.

Legal Reserve Requirement and Financial Performance

The coefficient of LRR is 0.694 which implies that keeping other variables in the study constant, 1% increase in LRR results a 69.4% increment of ROA. Regarding legal reserve, result of the

study is in line with the result of Punita and Somaiya (2006). LRR has established positive and significant relationship with profitability of commercial banks in Ethiopia. This is mainly due to the contribution of LRR in increasing the capital capacity of banks by transferring 25% of their annual net profit to the legal reserve account. Legal reserve is an equity account and its cumulative is reported in the banks' balance sheet. It is important in strengthening the financial position of banks so that they can cope with contingencies.

Branch Expansion Requirement and Financial Performance

Branch expansion requirement is the other study variable that influenced the growth direction of banks towards attaining the Growth and Transformation Plan of the country. Banks were one of the main sectors that the government had identified as a source of funds to achieve the Growth and Transformation Plan. Based on this, the government used branch expansion to achieve growth of the sector and ensure accessibility. NBE moral suasions that follows the issuance of the Growth and Transformation plan has placed a 25% branch expansion as an important policy direction to be followed by commercial banks.

Finding of the study with respect to BER opposed previous studies [Zardhoohi & Kolari (1994), Seale (2004), Adelowotan (2016), and Nyatika (2017)] in that the variable resulted in negative and insignificant effect on ROA. The direction of relationship may be due to the demand of branch expansion for huge establishment cost and branch running costs in terms of rent and staff employment. In addition, branch opening has pressure on bank management through directing their attention towards control of large branch networks and monitoring branches performances. On the other way, the result of insignificant relationship may be due to the fact that the requirement is lack of penalty for banks that fail to comply with it. Any bank that fails to comply with the requirements of the directives of NBE is subject to penalty. However, moral suasions are not presented with penalty for violation of requirements. Based on this, the branch expansion requirement does not have an explicitly written directive that sets penalty for banks found to have violated the requirement. This may have allowed the banks to freely determine the branch growth rate that adapt the pressure from the requirement. In this regard, result of the descriptive statistics could be used as a good evidence to show the presence of branch growth variation among the banks.

Bank Size and Financial Performance

The regression output indicates presence of negative and insignificant relationship between bank size and financial performance of commercial banks in Ethiopia. Since the coefficient was statistically insignificant, we could not say size has negative effect on banks' financial performance. However, the direction of the relationship may be due to the disproportional growth of asset size against income.

Inflation and Financial Performance

The estimated value of the coefficient of INF is 0.023 and it is interpreted as keeping other things constant if INF increase by 1%, ROA will increase by 2.3%. This indicates that the commercial banks of Ethiopia properly adjusted the lending interest rate against inflation. The empirical study of Anthanasoglou et. al. (2006) indicated that the effect of inflation on the profitability of banks depends on whether it is anticipated or unanticipated. An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates so that it can increase revenues faster than costs and thus acquire higher profits. The same is true in the case of Ethiopian commercial banks and we can say that inflation is anticipatable in Ethiopia so that the banks appropriately adjusted their lending rate following the change in inflation.

Deposit Interest Rate and Financial Performance

The value of the coefficient of DIR is 0.169 and it is interpreted as keeping other things constant if DIR increases by 1% ROA decreases by 16.9%. There are two types of interest that will influence the profitability of a bank which are interest expenses (deposit interest) and interest income (lending interest). When there is inflation, central banks increase the deposit interest rate with the aim of managing money flow in the market. Therefore, the operating expenses of the bank will increase giving negative impact on bank profitability. However, there is a tradeoff in that when the interest rate increases, customers will prefer to save in the banks to earn profits. In 2017, with the aim of controlling inflation NBE issued Interest Rate Directive No. NBE/INT/12/2017 that increases the minimum interest rate on saving and time deposits from 5% to 7%. The negative relationship established between DIR and ROA is an expected scenario considering the negative effect of an increase deposit rate on the yield from intermediation business. In other words, the

increase in cost of fund exposes banks to high interest expense which in turn narrows the interest spread and affect profitability.

GDP and Financial performance

The estimated value for the coefficient of GDP is 0.1 which is interpreted as holding other variables in the model constant if GDP increase by 1% ROA will increase by 10%. The results of this study confirm that GDP growth has positive and significant effect on financial performance of commercial banks. Finding of the study with respect to GDP support the study result of Demirguc-kunt & Huizinga (1999) and Belayneh (2011). As the economy grows, there will be better business opportunities and more people will need loans from banks. Moreover, with a good economic growth, the profitability of banks will increase as people are more likely to work and repay their loans.

Based on the above analysis, the following table is configured to exhibit the comparison between actual results and study's expectations.

Table 4.7. Comparisons of Actual Results with Expectations.

Explanatory Variables	Expected Direction of Relationship with ROA	Actual Direction of Relationship with ROA	Statistical Significance at 5%
Capital Adequacy Requirement	Positive	Negative	Significant
Minimum Paid-up Capital requirement	Positive	Positive	Significant
Liquidity Requirement	Positive	Positive	Significant
Statutory Reserve Requirement	Negative	Positive	Insignificant
Legal Reserve Requirement	Positive	Positive	Significant
Branch Expansion Requirement	Positive	Negative	Insignificant
Bank Size	Positive	Negative	Insignificant
Inflation	Negative	Positive	Significant
Deposit Interest Rate	Negative	Negative	Significant
GDP	Positive	Positive	Significant

Source: Compiled by the researcher, 2021.

CHAPTER-5

SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1. Introduction

This chapter is provided in four sections. The first part presents summary of the study. Then, conclusion of the study's findings is presented. In the third section, recommendations are presented and finally the study ends up by providing direction for further researches.

5.2. Summary

Inconclusiveness and imprecise view of variable measurement are the major gaps of the extant studies and these gaps motivated the researcher to conduct the study. Based on this, the researcher designed this study that sought to examine the effect of selected NBE regulatory variables on financial performance of commercial banks in Ethiopia for the period 2010-2019. The research design adopted by the study was explanatory. The study was guided by the buffer theory, modern portfolio theory, signaling theory, and liquidity preference theory. Bank regulation was proxied by six key regulatory variables: capital adequacy requirement, minimum paid-up capital requirement, liquidity requirement, statutory reserve requirement, legal reserve requirement, and branch expansion requirement. Return on Asset was used to represent commercial banks' financial performance. The study used secondary data of 16 commercial banks collected from NBE and website of each commercial banks for a period of 10 years (2010-2019). An Ordinary Least Squares (OLS) regression was used to estimate equation of the model and in order to achieve this, a software package of E-views 10 was used. Model of the study met all the five assumptions of CLRM. Fixed effect model of panel regression analysis and results of descriptive statistics were used to analyze the data. The regression output of the study indicated that capital adequacy requirement, minimum paid-up capital requirement, liquidity requirement, legal reserve requirement, inflation, deposit interest rate, and GDP established significant relationship with ROA of commercial banks. On the other hand, statutory reserve requirement, branch expansion requirement and bank size have statistically insignificant relationship with ROA of commercial banks.

5.3. Conclusion

From the study's result it is noted that an increase in capital adequacy results decrease in ROA and this indicates that the main source of income for commercial banks in Ethiopia is the money they obtained from depositors since liabilities are a cheaper source of finance than equity. An upsurge in paid-up capital requirement also increases ROA due to the opportunity from a capital increase in creating reliable liquidity standing for banks, and thereby improve financial resilience and soundness of banks. Liquidity requirement has also a positive effect on ROA so long as highly liquid banks have more money to lend out and thus make profit. The other regulatory variable is legal reserve requirement that has established positive and significant relationship with ROA of commercial banks due to its contribution in increasing the capital capacity of banks by transferring 25% of their annual net profit to the legal reserve account (equity account). The account is important for the banks in strengthening the financial position of banks so that they can cope with contingencies.

On the other way, the study indicates that financial performance of banks is not limited to regulatory variables. The positive relationship between inflation and ROA shows that commercial banks have been successful in responding to inflation. They were working to appropriately adjust lending interest rate against inflation so that they increase revenues faster than costs and thus acquire higher profits. The negative relationship established between deposit interest rate and ROA tell us how the increase in cost of fund narrows the interest spread and thus exposes banks to reduced profit. Generally, in light of the findings of the study described above, it is possible to understand that NBE bank regulations have a direct and significant effect on the profitability of commercial banks.

5.4. Recommendation

- As observed from the results of the study, liquidity requirement significantly affects ROA of commercial banks in a positive way. Commercial banks are therefore recommended to increase liquidity so that they will enjoy higher profit by lending out the money.
- Another observation from the result of the study is the fact that the main source of income for commercial banks is contributed from the money they obtained from depositors. It is therefore recommended that NBE in its directives and regulations to support and encourage

commercial banks to increase deposit. When NBE revises existing regulations and issues new regulations, it is suggested that the regulations should consider the way commercial banks tend to mobilize more deposits. Commercial banks are also proposed to develop strategies that enhance deposit amount.

- The study result indicates that rise in minimum paid-up capital and legal reserve increase ROA by improving financial resilience and soundness as well as minimizing liquidity concerns. Therefore, it has become necessary to raise the minimum paid-up capital required for banks. Banks should comply with capital requirements by finding mechanisms to increase their paid-up capital amount. The study also recommends NBE to strengthen the capital requirements for commercial banks even more to ensure optimal performance and industry growth. This is because an increased capital, apart from increasing financial performance, helps to maintain public confidence in the banking system by providing a measure of assurance to the public in that banks will continue to provide financial services even when losses have been incurred.
- Based on the finding of the study that reveals the relationship between ROA, interest rate and inflation, the researcher recommends commercial banks to focus not only on inflation when adjusting lending interest rates, but also take into account deposit interest rates. The commercial banks, therefore, should concentrate on rising their profitability by charging a sensible interest rate that is carefully adjusted for both inflation and deposit interest rate.

5.5. Direction for Further Researches

The study focused only on directives that the researcher thought they would have a direct impact on the profitability of banks. There may be other directives that remain unstudied but potentially influence performance of banks. Therefore, future studies may make the findings of the study more inclusive and broader by focusing on other regulatory variables not included in this study. In addition, NBE regulates not only banking business but also other areas such as insurance business, microfinance business, and capital good finance businesses. It is better if future studies take the above-mentioned institutions and businesses into account upon designing a research whose rim revolves around NBE regulation.

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APPENDICES

Appendix 1- List of Commercial Banks in Ethiopia

No.	Name of Banks	Year of Establishment
1	Commercial Bank of Ethiopia S.C (CBE)	1963
2	Awash International Bank S.C (AIB)	1994
3	Dashen Bank S.C (DB)	1995
4	Bank of Abyssinia S.C (BoA)	1996
5	Wegagen Bank S.C (WB)	1997
6	United Bank S.C (UB)	1998
7	Nib International Bank S.C (NIB)	1999
8	Cooperative Bank of Oromia S.C (CBO)	2005
9	Lion International Bank S.C (LIB)	2006
10	Oromia International Bank S.C (OIB)	2008
11	Zemen Bank S.C (ZB)	2009
12	Bunna International Bank S.C (BIB)	2009
13	Berhan International Bank S.C (BBI)	2010
14	Abay Bank S.C. (AB)	2010
15	Addis International Bank SC. (AdIB)	2011
16	Dehub Global Bank S.C. (DGB)	2012
17	Enat Bank S.C. (EB)	2013

Source: National Bank of Ethiopia, Annual Report 2019/2020.

Appendix-2: Result of Heteroscedasticity Test

Heteroskedasticity Test: White

F-statistic	1.697937	Prob. F(10,123)	0.0884
Obs*R-squared	16.25408	Prob. Chi-Square(10)	0.0926
Scaled explained SS	23.98796	Prob. Chi-Square(10)	0.0076

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/30/21 Time: 11:53

Sample: 3 159

Included observations: 134

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.719044	1.930841	0.372399	0.7102
CAR^2	0.000881	0.001068	0.824822	0.4111
MPCR^2	-2.96E-06	7.11E-06	-0.416673	0.6776
LR^2	7.64E-05	0.000109	0.701923	0.4841
SRR^2	0.000416	0.000501	0.830561	0.4078
LRR^2	-0.052042	0.019609	-2.654059	0.0090
BER^2	-5.01E-05	2.84E-05	-1.767727	0.0796
BS^2	-0.000229	0.002709	-0.084695	0.9326
INF^2	-0.000177	0.000382	-0.461893	0.6450
DIR^2	0.008883	0.012980	0.684356	0.4950
GDP^2	-0.002704	0.005898	-0.458486	0.6474

R-squared	0.121299	Mean dependent var	0.640516
Adjusted R-squared	0.049860	S.D. dependent var	1.203335
S.E. of regression	1.172952	Akaike info criterion	3.235449
Sum squared resid	169.2255	Schwarz criterion	3.473331
Log likelihood	-205.7751	Hannan-Quinn criter.	3.332116
F-statistic	1.697937	Durbin-Watson stat	1.623019
Prob(F-statistic)	0.088409		

Appendix-3: Result of Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.681617	Prob. F(6,117)	0.1315
Obs*R-squared	10.63831	Prob. Chi-Square(6)	0.1002

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/30/21 Time: 11:49

Sample: 3 159

Included observations: 134

Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.225089	3.404521	-0.066115	0.9474
CAR	-0.002827	0.028279	-0.099983	0.9205
MPCR	-6.41E-05	0.002014	-0.031846	0.9746
LR	0.000852	0.008056	0.105814	0.9159
SRR	0.005722	0.013111	0.436405	0.6633
LRR	0.000770	0.081550	0.009438	0.9925
BER	0.001962	0.003302	0.594142	0.5536
BS	0.022244	0.115828	0.192040	0.8480
INF	-0.000320	0.011469	-0.027915	0.9778
DIR	0.005601	0.125257	0.044719	0.9644
GDP	-0.045554	0.081778	-0.557043	0.5786
RESID(-1)	0.382703	0.098901	3.869574	0.0002
RESID(-2)	-0.202537	0.105320	-1.923061	0.0569
R-squared	0.079390	Mean dependent var		-2.35E-16
Adjusted R-squared	-0.046505	S.D. dependent var		0.803325
S.E. of regression	0.821792	Akaike info criterion		2.563408
Sum squared resid	79.01510	Schwarz criterion		2.931044
Log likelihood	-154.7483	Hannan-Quinn criter.		2.712803
F-statistic	0.630606	Durbin-Watson stat		1.930975
Prob(F-statistic)	0.853460			

Appendix-4: Result of Hausman Test

Correlated Random Effects - Hausman Test

Equation: EQROA

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	35.043833	10	0.0001

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAR	-0.049849	0.011526	0.001218	0.0786
MPCR	0.001694	0.001318	0.000000	0.5129
LR	0.013808	0.008643	0.000016	0.1950
SRR	0.040440	0.036934	0.000040	0.5791
LRR	0.647845	0.109764	0.029350	0.0017
BER	-0.004955	-0.008605	0.000003	0.0384
BS	-0.067710	-0.110076	0.034643	0.8199
INF	0.016737	0.008767	0.000053	0.2731
DIR	-0.102762	-0.076502	0.003434	0.6541
GDP	0.107013	0.046513	0.001859	0.1606

Sum squared resid	63.52556	Schwarz criterion	3.041807
Log likelihood	-140.1291	Hannan-Quinn criter.	2.708027
F-statistic	4.271190	Durbin-Watson stat	1.537035
Prob(F-statistic)	0.000000		