FACTORS AFFECTING PROFITABILITY OF COMMERCIAL BANKS IN ETHIOPIA

A RESEARCH PAPER SUBMITTED TO DEPARTMENT OF ACCOUNTING AND FINANCE FOR PARTIAL FULFILLMENT OF BA DEGREE IN ACCOUNTING AND FINANCE.

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June, 2019

Wolkite, Ethiopia

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ACKNOWLEDGEMENT

First of all I would like to thanks my heartfelt to almighty God, who helped me on all of my life activities whose offerings, forgiveness and grateful helps are precious forever. Next, I would like to express my sincere and heart full thanks to my Advisor Mr. Demelash G. he gave his time and energy to read the paper and make valuable professional advice and also constructive comment. Finally, my deepest and heart full gratitude goes my family who supported me morally and financially support during my education.

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ACRONYM

ROA: Return on asset

ROIC: Return on invested capital

SCP: Structure Conduct Performance

WACC: Weighted Average Cost of Capital

CLRM: Classical Linear Regression Model

NBE: National Bank Ethiopia

HP: Hypotheses

DW: Durbin-Watson

ABSTRACT

Both internal and external factors profitability Commercial Banks in EthiopiaThe study used panel data of eight commercial banks from year 2013 to 2017. The study employed an explanatory type of research and secondary financial data were used. Random effect regression model was applied to investigate the impact of capital adequacy, operational efficiency, liquidity risk, bank size and concentration on profitability. Return on assets (ROA) was used as a measure of profitability. Based on the result of hausman specification test the study used random effect model. The major findings of the study show that capital adequacy, banksize have statistically significant and positive relationship with banks' profitability. Further, the results from the panel regression suggest that, operational efficiency have a negative and statistically significant relationship with banks profitability. However, the liquidity risks have a negative and statistically insignificant relationship with banks profitability.Theconcentration has a positive and statistically insignificant relationship with banks profitability. The study suggests focusing and redesigns the firms together with significant key internal and external drivers of profitability of commercials banks.

Ethiopia Keywords: Profitability Commercial Banks

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Banks mobilize, allocate and invest the greatest part of the economic agent's savings. Accordingly, their performance has substantial consequences on capital allocation, firm expansion, industrial growth and economic development. Therefore, efficiency and profitability of banks is of interest not just at the individual bank level, but also is important at a broader macroeconomic level Aremu and Mejabi (2013).

In the developing countries financial markets are usually underdeveloped and undersized so in that case the banks fill in the gap between borrowers and savers and provide the profitable and secure funds channeling. Taking in to consideration that savings and investments are among the most important factors of economic growth, the health of the general economy of a country is in a great way dependent on the well-functioning financial system. That is especially true for countries like Ethiopia, where the banking sector is the backbone of the economy. Ethiopia financial sector is characterized by the dominant role of the commercial banks in Ethiopia

Profitability is a reflection of how banks are run, given the environment in which they operate. More precisely, it should mirror the quality of a bank's management and the shareholder's behavior, the bank's competitive strategies, efficiency and risk management capabilities Aburime (2007). Profits affect bank's cost of raising capital in both ways, as a direct contributor to equity financing and as indicator for external investor's assessment of the financial strength of the bank.The main factors of profitability are empirically well explored although the definition of profitability varies among studies. Disregarding the profitability measures, most of the banking studies have noticed that both the internal environment of the organization and external environment are important drivers of high profitability. Therefore in this study, the drivers that would be considered are in two categories namely internal and external or factors of Profitability.

Internal of bank profitability can be defined as factors that are influenced by a bank's management decisions. Such management effects will definitely affect the operating results of banks. Although a quality management leads to a good bank performance, it is difficult, if not

impossible, to assess management quality directly. External factors of bank profitability are factors that are beyond the control of a bank's management. They represent events outside the influence of the bank. However, the management can anticipate changes in the external environment and try to position the institution to take advantage of anticipated developments. The external determinant is industry-specific determinants. In the context of the above discussions, the purpose of this study is to the factors affecting profitability of commercial banks in Ethiopia.

1.2 statement of problem

It is widely believed that financial system plays a vital role in the economic growth and development of a country. In fact, it is the system by which a country directs it to the most profitable and efficient sectors to most productive sources of future growth. The main role of a financial system is not only to transfer funds from savers to investors but also to ensure that funds are being transferred to the sectors which are most important for an economy. Banks are the most crucial financial intermediaries in most economies that render a bundle of different services. Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou, 2008). Therefore, it is important to understand the factors which really affect the banking sector's profitability.

At present commercial banks in Ethiopia are dominant in respect of numbers and efficiency in the banking sector of Ethiopia. Commercial banks in Ethiopia have gone into significant changes after the liberalization of the banking system. Profitability of commercial banks is pro foundation for product innovation, diversification and efficiency of the commercial banks in Ethiopia. Profitability of commercial banks in Ethiopia is important for the efficiency of commercial banks. However, there is improvement in profitability from time to time Ethiopian banks performance has still remained poor with substantial gaps in service delivery to agents, particularly to the rural and lower-income population. This very limited access to basic payment services or saving accounts clearly indicates as the industry is performing poorly.

Moreover, fear of risky investments by commercial banks in Ethiopia which may result in greater amount of profit for them and lack of active secondary stock market in the country which may reduce their investment options and their profitability as well are also clear indicators as Ethiopian banks are still not operating at their full capacity. In general, even if commercial banks

looks like capital adequacy, operational efficiency, liquidity risk, bank sizeand concentration which are the most important factors to the profitability of commercial banks in Ethiopia .All the above discussed problems in the banking industry of Ethiopia in relation to performance in general and profitability in particular along with the gap in the literature with respect to profitability and the link between profitability and internal and external factors call for detailed investigation. Therefore, this study seeks to fill the gap by providing full information about the internal and external factors that affects profitability by examining the untouched one, and replicating the existing in the Ethiopian context by using all commercial banks operated in the country that had 5 years data

1.4 objective of the study

1.4.1 General objective

The objective of this study is to investigate factors affecting profitability of commercial Banks in Ethiopia.

1.4.2 Specific Objective

The specific objectives of the study are:

To examine the impact of bank specific factors

1. To examine the impact of capital adequacy on banks profitability.

2.Toexaminethe impactofoperationalefficiencyonbanksprofitability.

3.To examine the impact of liquidity risk on banks profitability.

4. To examine the impact of banks size on banks profitability.

5. To examine the impact of concentration on banks profitability.

1.5 hypotheses of the study

In line with the broad purpose statement the following hypotheses were also formulated for investigation. Based on the objective, the present study seeks to test the following hypotheses:

HP1: There is a significant positive relationship between capital adequacy and banks profitability.

HP2: There is significant negative relationship between operating efficiency and banks profitability

HP3: There is a significant Positive/Negative relationship between the liquidity risk and banks profitability

HP4: There is a significant positive relationship between banks size and banks profitability.

HP5: There issignificant positive/Negative relationship between concentration and banks profitability.

1.6 Scope of the Study

The study carried out on financial data of eight selected commercial banks in Ethiopia. The researcher tried to look into their profitability and see how these internal and external factors have an impact on these banks in the period of 2013-2017 (5years). The idea is to investigate empirically the factors and study how they affect the profitability of these commercial banks in Ethiopia within that period.

1.7 Limitation of the Study

The study used more of financial related variables than that of non-financial measure variables which may have influence and might need a further investigation. Financial reports within five years may be affected by different non modeled variables in the state of the economy. This might fail to measure the actual effects of the internal and external factors of profitability of commercial banks.

1.8 Significance of the Study

The main objective of this study is the factors affecting profitability of Commercial Banks in Ethiopia. Therefore, this study is expected to provide empirical evidence on the profitability of Commercial banks in Ethiopia.This research does have significant role to play in shading light on how to better understand what factors financial institutions particularly profitability commercial banks in Ethiopia. Furthermore, this study does have a paramount importance in providing a better ground for bank managers, business professionals, business initiatives and policy makers. Moreover, the researcher also contributes that this study can potentially serve as a stepping stone for further research in the area.

1.9 Organization of the study

The main objective of the study is factors affecting profitability of Commercial Banks in Ethiopia. This research Paper is organized in to five chapters. Chapter One: Provide some

background of the study, problem of statement, specifies the objectives and the significance of study. Chapter two: The literature reviews of related theoretical and empirical literatures; Chapter three: This chapter describes the data identifies the sources and explains the methodology which is employed in the study. The Chapter four data analysis and discussion of results described. In Chapter five presents the conclusion and recommendation of the regression analysis described

CHAPTER TWO

LITERATURE REVIEW

2. INTRODUCTION

The study isprofits are important not only because of the information it provides about the health of the bank in any given year, but also because profits are a key factors of growth and employment in the medium-term. Changes in profitability are an important contributor to economic progress via the influence profits have on the investment and savings decisions of companies. The existence, growth and survival of a business organization mostly depend upon the profit which an organization is able to earn. It is true that when Profitability increases the value of shareholders may increase to considerable extent. The term profitability refers to the ability of the business organization to maintain its profit year after year. The profitability of the organization will definitely contribute to the economic development of the nation by way of providing additional employment and tax revenue to government exchequer the fund of a government.

In order for a business entity to continue to prosper, there is need for its earnings to be relatively stable for its expansion and growth over time. In addition to its level of earnings, its external environment must also be carefully understood and reliably anticipated. The business organization must ensure that right technology is pursued so as to achieve organizational objectives Mejab and Gbadeyan, (2011).

2.1 Theories on Profitability

2.1.1 Regulation

The main objective of regulation and supervision in the banking is to deter excessive risk taking in the banking sector. Without any regulation, politicians assume that banks will take on more risks than necessary and acceptable for depositors. At the same time risk taking is beneficial for average individual banks, one bank failure is highly undesirable for depositors and may spill over to the entire banking sector.

2.2.2 The Structure Conduct Performance (SCP) Model

The relationship between performance and market structure on the banking industry is based on the development of the theory in the industry organization. The Structure Conduct Performance model is one of the earliest frameworks used to examine the factors that determine the profitability of Banks (Grygorenko, 2009). Baye (2010), (as quoted by Damena, 2011) the structure of an industry refers to the factors such as technology, concentration, and market conditions. Conduct refers to how individual firms behave in the market; it involves pricing decisions (such as interest rate, commission and fees), advertising decisions, and decisions to invest in research and development, among other factors. Performance refers to the resulting profits and social welfare that arise in the market.

2.2.3 Efficiency Hypothesis

A theoretical attempt to offer an alternative explanation on the market Structure Conduct Performance (SCP) relationship is the efficiency hypothesis which states that banks earn more profit because they are more efficient than others. In other words, profitability of bank is determined not by the market concentration but by bank efficiency (Grygorenko, 2009). There are also two distinct approaches within the efficiency; the X-efficiency and Scale– efficiency hypothesis. According to the X-efficiency approach, more efficient firms are more profitable because of their lower costs. Such firms tend to gain larger market shares, which may manifest in higher levels on market concentration, but without any causal relationship from concentration to profitability (Athanasoglou, Delis & Staikouras, 2006). The scale approach emphasizes economies of scale rather than differences in management or production technology. Larger firms can obtain lower unit cost and higher profits through economies of scale. This enables large firms to acquire market shares, which may manifest in higher concentration and then profitability (Athanasoglou et al., 2006).

2.2 Measure of Profitability

There are different ways to measure profitability such as: return on asset (ROA), return on equity (ROE) and return on invested capital (ROIC). ROA is an indicator of how profitable a company is relative to its total assets. It gives us an idea as to how efficient management is in using its assets to generate earnings whereas ROE measures a company's profitability which reveals how much profit a company generates with the money shareholders have invested. ROIC is a measure

used to asses' company's efficiency in allocating the capital under its control in profitable investments. This measure gives a sense of how well a company is in using its money to generate returns. Comparing a company's ROIC with its weighted average cost of capital (WACC) reveals whether invested capital is used efficiently or not.

2.2.1 Factors affecting banks profitability

The review of empirical literatures on bank profitability show that factors are organized in two parts namely internal and external factors. The internal factors include variables driven from financial statement and variables internal by their very nature. External factors comprise review of industry-specific factors which has impact on the banking sector profitability alone and which affect all business activities of a given country.

2.2.1.1 Internal factors

The internal are factors that are related to internal efficiencies and managerial decisions. Such factors include factors such as capital adequacy, operational efficiency, Liquidity risk and bank size.

Capital Adequacy: it is measured by the ratio of equity capital to total asset. Bank equity capital can be seen in two ways. Narrowly, it can be seen as the amount contributed by the owners of a bank (paid-up share capital) that gives them the right to enjoy all the future earnings or more comprehensively or it can be seen as the amount of owners' funds available to support a bank's business. It examines the relationship between profitability and bank capitalization. A strong capital structure is essential for financial institutions in developing economies, since it provides additional strength to withstand financial crises and increased safety for depositors during unstable macroeconomic conditions. A high capital asset ratio is assumed to be indicator of low leverage and therefore lower risk.

BankSize: In most studies of bank profitability factors, the total asset is used a measure for potential economies or diseconomies of scale in the banking sector. Additionally bank size is associated with diversification which may impact favorably on risk and product portfolio .Economies of scale will reduce the cost of gathering and processing information Boydetal,(1993) so that a positive effect of bank size is associated with profitability.

Akhaveinetal. (1997) and Spinlock (1985) found apositive and significant relationship between size and bank and profitability.

Liquidity Risk: Liquidity is a prime concern for banks and the shortage of liquidity can trigger bank failure. Banking regulators also view liquidity as a major concern. This is because banks without sufficient liquidity to meet demands of their depositors risk experiencing bank run. Holding assets in a highly liquid form tends to reduce income as liquid asset are associated with lower rates of return. For instance, cash which is the most liquid of all assets is a non-earning asset. It would therefore be expected that higher liquidity would negatively correlates with profitability. Liquidity risk is estimated by the ratio of liquid assets to total assets.

Operating Efficiency: It is used as an indicator of management's ability to control costs and is expected to have a negative relation with profits, since improved management of these expenses will increase efficiency and therefore raise profits. The expense to income ratio is used as proxy for operating efficiency.

2.2.1.2 External factors

The External factors profitability commercial banks are those factors which are external to the commercial banks and hence outside the control of management. The External determinants of profitability commercial banks are those factors which are external to the commercial banks and hence outside the control of management. The following sections discussed about external factors of profitability commercial banks in Ethiopia such as Industry-specific factors are market concentration.

Concentration:as noted by Damena (2011) in the normal circumstances, a higher bank concentration might be the result of a tougher competition in the banking industry, which leads to negative relationship between performance and market concentration. However, if collusion occurs among firms, it may result that higher rates may be charged on loans and lower interest rates may be paid on deposits, then it may have a positive impact on profitability.

2.3 Review of previous studies

2.3.1 Review of Related Empirical studies in other countries

Athanasoglou et.al (2005) in their paper specified an empirical framework to investigate the effect of Bank-specific and industry-specific factors on the profitability of Greek banks. They

used capital, concentration the cyclical output. They found that capital is important in explaining bank profitability and that increased exposure to credit risk lowers profits. Additionally, labor productivity growth has a positive and significant impact on profitability, while operating expenses are negatively and strongly linked to it, showing that cost decisions of bank management are instrumental in influencing bank performance. Athanasoglou, et.al (2006) aim of their study was to examine the profitability behavior of bank-specific using an unbalanced panel dataset of South Eastern European credit institutions over the period 1998- 2002.

Athanasoglou, P. Delis, M. and Staikouras, (2006) examined the profitability behavior of bank specific, industry-related using an unbalanced panel dataset of South Eastern European credit institutions over the period 1998-2002. The bank variables are obtained from the Bank Scope database, the International Financial Statistics and the banking reform index from the European Bank for Reconstruction and Development. Return on assets and return on equity are chosen as proxies for bank profitability. Among the independent variables analyzed capital adequacy, operating efficiency, liquidity risk bank size, concentration, economic activity. The least squares methods of fixed effects and random effects models were applied in the analysis. The estimation results indicate that, with the exception of liquidity, all bank-specific insignificantly affect bank profitability in the anticipated way. A key result is that the effect of concentration is positive, which provides evidence in support of the structure-conduct performance hypothesis. In contrast, a positive relationship between banking reform and profitability was not identified, whilst the picture regarding is mixed. The paper was concluding that some remarks on the practicality and implement ability of the findings.

Pasiouras & Kosmidou (2007) examine how bank's specific characteristics and the overall banking environment affect the profitability of commercial domestic and foreign banks operating in the 15 European Union countries over the period 1995-2001. They find that all explanatory variables employed significantly affect the bank profitability although their impacts are not always uniform for domestic and foreign banks. Ben Nicer and Omran (2011) revealed the influence of bank regulations, concentration and financial and institutional development on the Middle East and North Africa countries commercial bank's margins and profitability during the period 1989-2005. They found capital adequacy and bank size had a positive impact on banks and profitability. On the other hand financial development indicators had no significant impact

on bank performance Goddard et al. (2004) investigated the profitability of European banks during the 1990s using cross-sectional, pooled cross-sectional time-series and dynamic panel models. Models for the factors of profitability incorporate bank sizeand liquidity risk as well as dynamic effects. Despite intensifying competition there is significant persistence of abnormal profit from year to year. The evidence for any consistent or systematic size–profitability relationship is relatively weak. The relationship between the importance of off-balance-sheet business in a bank's portfolio and profitability is positive for the UK, but either neutral or negative elsewhere. The relationship between the capital adequacy and profitability is positive.

2.3.2 Review of Related Empirical studies in Ethiopia

Few studies were appearing on the factors of profitability commercial banks in Ethiopia by taking different internal and external variables taken into account. Most literatures that are examined in this study used a number of banks specific and industry specific factors of banks profitability Amdemikael (2012) investigated Factors Affecting Profitability commercial banks in Ethiopia. This study examines the bank-specific and industry-specific factors affecting bank profitability for eight commercial banks in Ethiopia, covering the period of 2013 - 2017. He adopts a quantitative research approach by combining documentary. He used ROA as a dependent variable and capital adequacy, operational efficiency, liquidity risk, bank size and concentration as independent variables. The findings of the study show that capital adequacy, liquidity risk, bank size and concentration have statistically significant and positive relationship with banks' profitability. On the other hand, variables like operational efficiency have a negative and statistically significant relationship with banks' profitability. The study carried out by Samuel Alamu (2015) analyzed that the factors of commercial banks profitability in Ethiopia by using data of eight commercial banks from year 2013 to 2017.The study used explanatory research approach and secondary financial data are analyzed by using multiple linear regressions models for the bank profitability measure, Return on Asset (ROA). Random effect regression model was applied to investigate the impact on banks profitability. The findings of the study show that bank size and capital adequacy have statistically significant and positive relationship with bank's profitability. On the other hand, variables like operational efficiency have a negative and statistically significant relationship with banks' profitability. However, the relationship for concentration is found to be statistically insignificant. The relationship for negative liquidity

risks is found to be statistically insignificant. Habtamu (2012) examined the factors commercial banks profitability in Ethiopia by using panel data of eight commercial banks from year 2013 to 2017. He used quantitative research approach and secondary financial data are analyzed by using multiple linear regressions models for the one banks profitability measures; return on Asset (ROA). He applied random effect regression model to investigate the impact of capital adequacy, operational efficiency, liquidity risk, bank size and concentration on major bank profitability measures (ROA. The empirical results shows that bank specific factors; capital adequacy, operational efficiency, liquidity risk, bank size and industry specific factors; concentration have a strong influence on the profitability commercial banks in Ethiopia. The main objective of the study made by Birhanu (2012) is to examine the effect of bank specific and industry-specificfactors of commercial banks Profitability from the period 2013 – 2017 by using ordinary least square estimation method to measure the effects of internal and external factors on profitability in terms of returnon asset. The result reveals that, all bank-specificfactors, capital adequacy, liquidity risk, bank size and concentration with the affect bank profitability significantly and positively in the anticipated way. However, the operational efficiency affects the commercial banks profitability significantly and negatively. In addition to this, no evidence is found in support of the presence of market concentration. They are investigated the factors of profitability commercial banks using secondary data. The study employed audited financial statements of eight commercial banks for the period of 2013 to 2017.The study used return on assets (ROA) as dependent profitability variable. Moreover, the study used both bank specific external and internal variables as explanatory variables. The descriptive statistics model specifically random effects estimation were used to analyze the relationships of profitability variable with explanatory variables. The major findings of the study showed that bank specific factors were very important in explaining profitability than external variables. They capital adequacy, liquidity risk, bank size and concentration were positively and significantly related to bank's profitability. Gemechu (2016) examined factors of banks' profitability from commercial banks in Ethiopia. The study applied balanced panel data of eight commercial banks that covers the period of 2013 - 2017. Ordinary least square (OLS) estimation technique used to see the impact of factors profitability of commercial banks. The findings of the study revealed that all bank specific factors capital adequacy, liquidity risk, bank size and concentration have

statistically significant and positive relationship with banks' profitability. On the other hand, variables operational efficiency has a negative and statistically significant relationship with banks' profitability.

2.4 Research gap

The empirical literatures that are discussed so far showed that, banks profitability is factors by both internal and external factors. Accordingly as per the knowledge of the researcher all the studies conducted in Ethiopian banking sector clearly failed to identify all the factors of profitability also and so this research added one variable to the study of factors of profitability of banks in Ethiopia that has not been tested in the previous researches moreover, t he result from Hence, the purpose different researchers as indicated in the literature review reveals the existence of controversial conclusions that results from different studies made so factors of this study is to investigate the factors of profitability commercial banks by utilizing to estimate both the internal and external factors of profitability of commercial banks in Ethiopia which is proposed to fill the existing knowledge gap.

CHAPTER THREE

RESEARCH METHODOLOGY

3. INTRODUCTIONS

The intent of this chapter is to provide brief outline of the broad objectives of the study and the underlying principle of research methodology and the choice of the appropriate research method for the study. The chapter is arranged as follow: 3 introduction, 3.1research design, 3.2 research approach, 3.3 sampling design and size 3.4 data sources and collection, 3.5 definition variables, 3. Data analysis and model specifications are included.

3.1 Research Design

The objective of this study is to examine the internal and external factors profitability of commercial banks in Ethiopia for the period covering from 2013-2017. This research is an explanatory research that adapts a quantitative research design by using a secondary data. The quantitative data gathering methods are useful especially when a study needs to measure the cause and effect relationships evident between dependent and independent variables Addisu (2011) (as Getachew, 2011).

3.2 **Research approach**

According to Creswell (2009), Quantitative research approaches. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). Therefore, for this study quantitative research approach is used to see the relationship between the profitability commercial banks and the bank specific and factors affecting banks profitability in Ethiopia by establishing causal relationship. This study also adopted an explanatory approach by using balanced panel research design to meet the research objective. As explained by explanatory research attempts to identify causal factors and outcomes of the target phenomenon. According to a panel of data will embody information across both time and space and it measures some quantity about them over time. The advantage of using panel data is to address a broader range of issues and tackle more complex problems than would be possible with pure time-series or pure cross-sectional data alone.

3.3 Sampling Design and Size

Particularly, the researcher used criterion sampling in which the banks service year is set as criteria and commercial banks in Ethiopia that meet this criterion areselected as a sample. From all commercial banks are listed by sample are listed eight commercial banks.

Table 1: List of banks selected for this research commercial Banks:

No	Name of Banks	Years
1	United Bank	1998
2	Nib International Bank	1999
3	Cooperative Bank of Oromia	2005
4	Loin International Bank	2006
5	Zemen Bank	2009
6	Abay Bank	2010
7	Addis International Bank	2011
8	Berhan International Bank	2011

3.4 Data source and collection

In order to analyze the effect of bank specific factors on profitability of banks financial statements of eight commercial banks (United Bank, Nib International Bank, Cooperative Bank of Oromia, Lion International Bank, Zemen Bank, Abay Bank, Addis International Bank, BerhanInternationalBank) for 5 years are collected. The secondary data collected through document reviews are mainly from the records held by financial statements and National Bank of Ethiopiathe banks.

3.5 Definition of Variables

3.5.1 Dependent Variable

The studyareexamined the profitability of commercial banks in Ethiopia by using return on asset (ROA) as a dependent variable. ROA is an indicator of how profitable a company is relative to

its total assets. It gives us an idea as to how efficient management is in using its assets to generate earnings. As Golin (2001) points out (cited by Ayele, 2013) the ROA has emerged as key ratio for the evaluation of bank profitability and has become the most common measure of bank profitability.

ROA= Net income/ Total asset.

ROA is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that banks.

3.5.2 Independent Variable

This subsection describes the independent variables that are used in the econometric model to estimate the dependent variables. Following prior researches towards the factors of banks profitability, the independent variables are bank-specific variables (Pasiouras& Kosmidou (2007).The bank-specific variables are internal factors and controllable for banks managers while the industry-specific variables are uncontrollable and hence external. Moreover, these subsection present hypotheses, by proposing the expected sign of the coefficients, based on academic literature.

3.6 Bank Specific Factors

The internal factors are factors that are related to internal efficiencies and managerial decisions. From the previously discussed factors in literature review the following areselected and used in this research.

Capital adequacy: It is measured by the ratio of equity capital to total asset. It examines the relationship between profitability and bank capitalization. A strong capital structure is essential for financial institutions in developing economies, since it provides additional strength to withstand financial crises and increased safety for depositors during unstable macroeconomic conditions. A high capital asset ratio is assumed to be indicator of low leverage and therefore lower risk. Conversely, banks with lower capital adequacy are considered riskier relative to highly capitalized banks.

HP1: There is a significant positive relationship between capital adequacy and bank's profitability.

Operating Efficiency: The expense to income ratio is used as proxy for operating efficiency. The expense to income ratio is defined as the operating costs over total generated revenues. The major elements of operating cost are staff salaries and administrative cost. It is used as an indicator of management's ability to control costs and is expected to have a negative relation with profits, since improved management of these expenses will increase efficiency and therefore raise profits. A negative correlation is expected between the operating cost and profitability implying that higher operating cost means lower profit and vice versa.

HP2: There is significant negative *relationship between operating efficiency and bank's profitability.*

Liquidity risk: is one of the types of risk for banks; when banks hold a lower amount of liquid assets they are more vulnerable to large deposit withdrawals. Therefore, liquidity risk is estimated by the ratio of liquid assets to total assets. Based on the risk-return hypothesis, more liquidity risk is associated with higher expected returns. Otherwise stated more cash and other liquid non-earning assets result in a lower expected return because these assets do not generate any return. Following prior research of Pasiouras & Kosmidou (2007), a negative relationship for liquid assets to total asset ratio and profitability is hypothesized.

HP3: There is a significant Positive/Negative relationship between the liquidity risk and the bank's profitability.

Bank Size: In most studies of bank profitability determinants, the total asset is used a measure for bank size. Bank size is usually used to account for potential economies or diseconomies of scale in the banking sector. Additionally, bank size is associated with diversification which may impact favorably on risk and product portfolio. Economies of scale will reduce the cost of gathering and processing information Boyd et al., (1993) so that a positive effect of bank size is associated with profitability. Akhaveinet al. (1997) and Smirlock (1985) found a positive and significant relationship between size and bank and profitability.

HP4: There is a significant positive relationship between banks size and bank's profitability.

3.7 Industry Specific Factors

This subsection discusses the industry concentration and banking sector development variables separately from bank-specific variables as far as this variable is to some extent external. That means managers cannot change the variable immediately like that of bank-specific variables.

Concentration: The concentration ratio measures the degree of bank concentration taking into account the banking sector. It is calculated as the total assets held by the commercial banks divided by the total assets of all commercial banks in Ethiopia. From the literature review, banks in highly concentrated markets tend to collude and therefore earn monopoly profits. However, not all studies, have found evidence to support the Structure Conduct Performance hypothesis.

HP5: There is positive/Negative relationship between concentration and bank's profitability.

3.6 Data analysis and Model Specification

This used panel data because panel data has the advantage of giving more informative data as it provides with insights which captures individual variability, and the time series information, which captures dynamic adjustment, the collected panel data were analyzed using multiple linear regression analysis. A multiple line regression model was used to determine the relative importance of each independent variable in influencing profitability. The descriptive statistics (Mean, Median, maximum and minimum values and standard deviations) was used to analyze the general trends of the data from 2013 to 2017. A multiple line regression model and t-static was used to determine the relative importance of each independent variable in influencing profitability. For this study, the regression analysis known as ordinary least square was used to estimate the relationship between profitability. In light of the above, to investigate the relationship between capital adequacy (CAP), operational efficiency (OPE), Liquidity risk (LIQ), Bank Size (Bs) andconcentration (CONC) the following linear regression model is developed. The variables are taken from different papers discussed in the empirical literatures taking into consideration the availability of data. The regression model of this study is estimated in the following form.

$$ROA = \beta 0 + \beta 1\ CAP + \beta 2\ OPE + \beta 3\ LIQ + \beta 4\ Bs + \beta 5\ CONC + \varepsilon.$$

Table 2: Definitions, Notation and Expected Effect of the Explanatory Variables

	Variables	Measures	*Notation*	*sign*

Dependent variable	Return on asset	Net Income /Total Assets	*ROA*	
Independent variable	Capital adequacy	Total Capital/Total Assets	*CAP*	+
	Operational efficiency	Total Cost/ Total Income	*Ope*	-
	Liquidity risk	Total Loan/ Total Deposit	*LIQ*	+/-
	Bank size	Natural Logarithm of Total Assets	*Bs*	+
	Concentration	Asset of the four largest banks/Asset of all Banks in the market	*CONC*	+/-

CHAPTER FOUR

RESULTS, ANALYSIS AND DISCUSSION

4. INTRODUCTION

In the preceding chapter the research design employed in this study is presented and discussed in detail. The purpose of this chapter is to present results and analysis of data involved in the study.Accordingly, the descriptive statistics of all the variables used in this study and the results of hypothesis testing i.e. the estimated parameters of the regression equation, their significance, the connection between the independent variables and dependent variable according to the sign and the value of the parameters for the regression model are presented and discussed in detail.

4.1 CLRM Assumption and Diagnostic Test

In order to provide more sights into diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Hence, the following sections discuss results of the diagnostic tests (i.e., heteroscedasticity, autocorrelation, normality and model specification test) that ensure whether the data fits the basic assumptions of classical linear regression model.

4.1.1 Test for Heteroscedasticity

The Heteroscedasticity problems arise when the variance of the error term is not constant.As noted in Brooks, (2008) the variance of the errors is constant, this is known as the assumption of homoscedacticity. If the errors do not have a constant variance, they are said to be heteroscedasticity. The study would be employed the popular white test to detect heteroscedasticity. This test involves testing the null hypothesis that the variance of the errors is constant (homoscedacticity) or no heteroscedasticity against the alternative that the errors do not have a constant variance. In this study, as shown below, both the F-statistic and Chi-Square versions of the test statistic draw the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values were in excess of 0.05. This indicates that, there is no evidence that we do not reject the null hypothesis implying that the residuals are homoscedastic, since the p-value was considerably in excess of 0.05.

Table 4.1.1 Heteroscedasticity Test: White

F-statistic	0.415731	Prob. F(15,24)	0.9592
Obs*R-squared	8.249733	Prob. Chi-Square(15)	0.9134
Scaled explained SS	8.243162	Prob. Chi-Square(15)	0.9137

Source: Financial statements of banks and NBE reports.

4.1.2 Test for Autocorrelations

This is an assumption that the errors term in one-time period is correlated with the error term in any other time period. The study employed the popular Durbin-Watson to detect the serial correlation. According to Brooks (2008), DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The rejection, non rejection, and inconclusive regions are shown on the number line.

This study used the dL and dU values for 40 observations, which as a very close of 40 observations. As indicated by the DW table for 40 observations with 5 explanatory variables at 1% level of significance, the dL and dU values are 1.190 and 1.476 respectively. The Durbin-Watson test of statistics value in table 4.1.2 was 1.57. This DW value of ROA lies in the region of failed to reject null hypothesis. Hence, serial correlation is not problems for this study.

Variables	DW test static result
All bank specific and bank industry variables	1.57

4.1.3. Normality Test

Normality test is used to determine whether the error term is normally distributed.The coefficient of kurtosis was to 2.918 and the Bera-Jarque statistic had a P-value of 0.269 implying that the data were consistent with a normal distribution assumption.

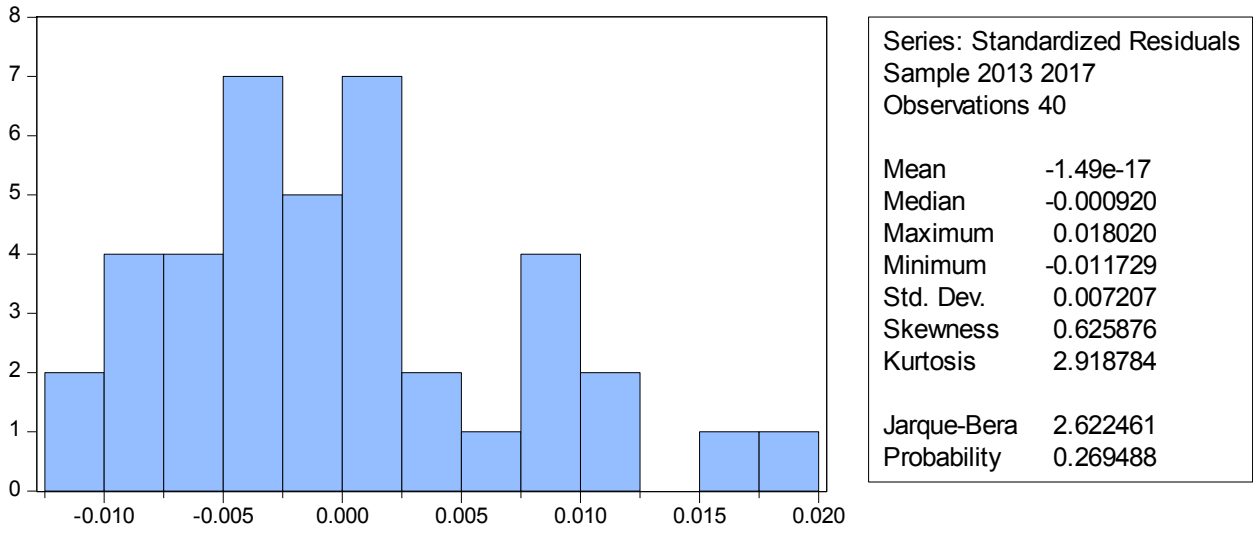

Figure 4. 2 Normality Test for Residuals

Source: Financial statements of banks and NBE reports.

4.2. Descriptive statistics

Table4.2presents the outcomes of the descriptive statistics for main variables involved in the regression model. Key figures, including mean, median, standard deviation, minimum and maximum value were reported. This was generated to give overall description about data used in the model and served as data screening tool.

Table 4.2 Descriptive Statistics

	ROA	CA	OPE	LR	SIZE	CONC
Mean	0.027333	0.16	2.128538	0.63075	3.787516	0.73356
Median	0.0271	0.15	1.5199	0.635	3.861728	0.7454
Maximum	0.0468	0.27	23.1055	0.89	4.340502	0.7851
Minimum	0.0032	0.09	0.6521	0.47	2.9154	0.6898
Std. Dev.	0.008848	0.042607	3.454084	0.074193	0.347433	0.038168
Observations	40	40	40	40	40	40

Source: Financial statements of banks and NBE reports.

For the total sample, the mean of ROA was 2.7% with aminimum of 0.3% and a maximum of 0.4%. That means, the most profitable bank among the sampled banks earned 4.6 cents of profit

before tax for a single birr invested in the assets of the firm. On the other hand, the least profitable bank of the sampled banks earned 0.3 cents of profit before tax for each birr invested in the assets of the firm. The standard deviation statistics for ROA was 0.008848 which indicates that the profitability variation between the selected banks was very small. The result implies that these banks need to optimize the use of their assets to increase the return on their assets. Regarding the explanatory variables of the model there are some interesting statistics that have to be mentioned. Despite the small dispersion in the minimum and maximum observation of ROA there could be seen relatively high variation in the equity to asset ratio. The ratio of equity to total assets capital adequacy was a proxy measure of bank capital adequacy with a mean value of 16%. This implies that, the sampled banks in this particular study 16% of their fund needs satisfied through equity capital. The standard deviation ratio was 0.0358% with9% and 27% as minimum and maximum values respectively.On the other hand, the cost-to-income ratio indicated by the range between 23.10% and 65%. The mean of the cost-to-income ratio equals 2.128%. The relatively higher range between the minimum and maximum value implies that the most efficient bank has a quite substantial cost advantage compared to the least efficient bank. Furthermore, the outputs of the descriptive statistics indicate that, the ratio of Advance to Deposit was 63%, on average, with a minimum of 47% and a maximum of 89%.This indicates that commercial banks in Ethiopia use 63% of customer deposit on lending. This shows that banks keep more than the statutory liquidity requirement. Customer deposit is one of the cheapest sources of fund due to the high margin between deposit and lending rate that banks utilize to generate income. The natural logarithm values were proxy to their total assets of sampled banks. The mean value of this variable was 3.787516 birr during the study period undertaken and have a standard deviation of34.7% birr. This depict that, there was reasonable dispersion among banks in terms of total assets when their natural logarithms values have taken. The minimum and maximum values were 2.9154and 4.340502birr respectively.The bank concentration variable indicates that the minimum concentration is 68.98% while the maximum is 78.51%. The bank has generally remained highly concentrated over the period with a mean concentration of 73%.

4.3. Correlation analysis among variables:

The capital adequacyand concentration are positively correlated variables with ROA. This correlation clearly shows that, as the capital adequacy and concentration with other banks increase, profitability also moves to the same direction. On the other the operational efficiency and liquidity risk and bank size seems to be negatively correlated with the profitability measure, indicating that, when the operational efficiency and liquidity risk increase, profitability moves to the opposite direction. Surprisingly, the capital adequacy and concentration of banks was positively correlated with ROA, indicated by the correlation of and 0.413805, 0.193 respectively ROA. In similar to the operational efficiency, bank size and liquidity risk was negatively correlated with profitability with a correlation of -0.55984, -0.08804 and-0.2338 respectivelyROA.

Table 4.3Correlation matrix of dependent and independent variables

	ROA	**CA**	**OPE**	**LR**	**SIZE**	**CONC**
ROA	1	0.413805	-0.55984	-0.08804	-0.2338	0.108465
CA	0.413805	1	-0.23858	-0.00162	-0.76635	0.21899
OPE	-0.55984	-0.23858	1	0.159098	0.127913	-0.20732
LR	-0.08804	-0.00162	0.159098	1	0.284161	-0.3468
SIZE	-0.2338	-0.76635	0.127913	0.284161	1	-0.51075
CONC	0.108465	0.21899	-0.20732	-0.3468	-0.51075	1

Source: Financial statements of banks and NBE reports.

4.4. Model Selection (Random Effect versus Fixed Effect Models)

To test the relationship between these commercial banks profitability (ROA) and identified profitability factors the theoretical model is developed based on the finance theory from the methodological part of this study. The important issue from the panel model is, it is specified whether it is fixed effects or random effects model. Because, there are broadly two classes of panel data estimator approaches that can be employed in empirical research: fixed effects models and random effects models. This also requires the high concern when the researcher employed the panel data approaches.According to Gujarati (2004), if T (the number of time series data) is

large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model. Hence the choice here is based on computational convenience. On this score, random effect model may be preferable. The best alternative to make a choice between fixed effects and random effects model is conducting Hausman specification test. In this study the Hausman specification tests is utilized to decide which model is appropriate to fit the sample data. Hausman specification test is the classical test of whether the fixed or random effects model should have used. Running a Hausman specification test at five percent level enables the researcher to choose between fixed effects and random effects models (Hausman, 1978). The hypothesis for Hausman specification test is:

Null hypothesis: Random- effect model is more appropriate

Alternative hypothesis: Fixed-effect model is more appropriate

Decision rule: if the P-value from the Hausman test is statistically significant (less than five percent) the fixed-effect model is preferred in favor of random effect, otherwise the random effect model is selected.

The result from Hausman test in tables allow as to not reject the null hypothesis that random model is better in this regression analysis. This implies that a random effect model is more appropriate than fixed effect model to undertake the panel regression estimation for this study.

4. 5 Correlated Random Effect- Hausman Test

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000

4.5.1 Random Effect Regression Result

This section presents the outputs of the regression analysis on the factors that affecting profitability commercial banks in Ethiopia. This section presents a random effect model regression result to examine the impact of explanatory variables (capital adequacy, operational

efficiency; liquidity risk; bank size and concentration) on the return on asset (ROA) of commercial banks in Ethiopia.

4.6 Regression Analysis Result

ROA=β0+β1CAP+β2OPE+β3LIQ+β4 Bs+β5Conc+ε.

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 05/27/19 Time: 10:49
Sample: 2013 2017
Periods included: 5
Cross-sections included: 8
Total panel (balanced) observations: 40
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.071566	0.061285	-1.167742	0.2510
CA	0.177620	0.058258	3.048837	0.0044*
OPE	-0.001237	0.000310	-3.992227	0.0003*
LR	-0.009053	0.015963	-0.567117	0.5744***
SIZE	0.015800	0.008434	1.873509	0.0696***
CONC	0.025871	0.039386	0.656859	0.5157***

Effects Specification

	S.D.	Rho
Cross-section random	0.004417	0.3733
Idiosyncratic random	0.005723	0.6267

Weighted Statistics

R-squared	0.484199	Mean dependent var	0.013703
Adjusted R-squared	0.408346	S.D. dependent var	0.007877
S.E. of regression	0.006059	Sum squared resid	0.001248
F-statistic	6.383391	Durbin-Watson stat	1.566337
Prob (F-statistic)	0.000279		

Unweighted Statistics

R-squared	0.336615	Mean dependent var	0.027333
Sum squared resid	0.002025	Durbin-Watson stat	0.965286

Notes: Significant at *5% and ***10% insignificant

Source: Financial statements of banks and NBE reports.

Now based on the regression results presented in the above Table4.6the model of this study can be written as follows:

ROA =-0.071566 β0+0.177620 CA-0.001237 OPE-0.009053 LR+0.015800SIZE+0.025871CONC

The estimation result of the operational panel regression model used in this study is presented in table 4.6.The R-squared statistics and the adjusted-R squared statistics of the model was 48% and 40% respectively. The result indicates that the changes in the independent variables explain 40% of the changes in the dependent variable. That is capital adequacy, operational efficiency; liquidity risk; bank size and concentration collectively explain 40% of the changes in ROA. The remaining 60% of changes was explained by other factors which are not included in the model. Thus these variables collectively, are good explanatory variables of the profitability of commercial banks in Ethiopia. The null hypothesis of F-statistic (the overall test of significance) that the R-square is equal to zero was rejected at 1% as the p-value was sufficiently low. F value of 0.000 indicates strong statistical significance, which enhanced the reliability and validity of the model. On the other hand, among the three external independent variables used in this study were found to be significant. The insignificant variables are liquidity riskand concentration. The coefficient of operational efficiency and liquidity risk against ROA were negative since the coefficients for those variables are negative-0.001237and -0.009053 respectively.On the other hand, variables like capital adequacy; bank size and concentration had a positive relationship with profitability since their respective coefficients were0.177620, 0.015800 and 0.025871. This revealed that there was a direct relationship between the above three independent variables and ROA. In general as per the regression results among the regress or used in this study three of them were significant.

4.6.1 Capital Adequacy

The coefficient of capital Adequacy which is measured by the equity to asset ratio was positive and statistically significant at 5% significance level (p-value=0.0044). The positive coefficient for capital strength was in favor of the signaling or bankruptcy costs hypotheses and in opposite to the risk-return trade-off hypothesis. Moreover, the coefficient of the ratio of equity to asset which was the four highest positive coefficients as compared to other variables shows that an

increase in capital will result in increased profitability. This is in line with the expectation as a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability. So from the findings we can conclude that capital adequacy was one of the main Factors of profitability Commercial banks in Ethiopia.

4.6.2 Operational Efficiency

The coefficient of the ratio of cost to income, which provides information on the efficiency of the management regarding expenses relative to income, was negative and statistically significant at 5% significance level (p-value=0.0003). This is in line with a prior expectation and makes the variable an important profitability banks. For instance, Sufian et.al, (2008) in their work on the Philippines banks realized as cost to income ratio exhibits a negative and significant impact on Philippines banks profitability. The results imply that an increase (decrease) in these expenses reduces (increases) the profits of financial institutions operated in Philippines. Coming back to this particular study, the result revealed that in the context of the profitability banks like that of Sufian et.al, (2008), Athanasoglou et al, (2005) and Suzuki et.al, (2011) results, the ratio of cost to income exhibits a negative and significant impact on the ROA. The negative relationship between operational efficiency and profitability in profitability commercial banks indicates that increased efficiency i.e. reducing operating expense will result in higher profitability for the banks.

4.6.3 Liquidity Risk

Loan Advances over total Deposits were used as a proxy for liquidity in the model. It indicates the percentage of bank's loans funded through deposits. Liquidity measures the ability of an organization to meet its obligations and the solvency of organization (Khan & Jain, 2008). The result indicates that the liquidity variable was negative and insignificant at level (p-value=0.5744). This implies that when a bank transforms a higher percentage of its deposit in to loans, the bank is expected to earn more profits. Thus, the higher the Liquidity ratio the higher the profitability of a bank and the higher the liquidity risk for the bank. The higher amount of loans against per birr deposit increases bank liquidity risk. The result is in line with the findings of samad (2015), who concluded in his study that liquidity positively correlates with profitability.

4.6.4 Bank Size

Bank size is significant and positively related with profitability commercial banks profitability at 5% significant level with a p value=0.0696. The coefficient of bank size0.015800 shows holding other variables constant a one percent change in bank size will have about percent change in profitability commercial banks. The result of this study is consistence with the result of other researchers who found a significant positive relationship between bank size and profitability.

4.6.5 Concentration

Concerning the coefficient of the only specific variable used in this study concentration is positive as hypothesized, and statisticallyat insignificant level (p-value=0.5157).Hence, this study finds no evidence to support the structure-conduct-performance hypothesis. The structure-conduct-performance hypothesis (also referred to as the market-power hypothesis) states that a more concentrated sector favors bank profitability motivated by the benefits of greater market power. The concentration is main factor that affect profitability commercial banks as indicated by the insignificant coefficient in the regression analysis output. The finding is consistent with the findings of, Damena (2011) and Molla (2012).

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

The preceding chapter presented the analysis of the findings, while this chapter deals with the conclusions and recommendations based on the findings of the study. Accordingly this chapter is organized into two sub-sections. Section 5.1 presents the conclusions and section 5.2 presents the recommendations.

5.1. CONCLUSIONS

The main objective of this study was factors affecting profitability commercial banks in Ethiopia using statistical cost accounting model. By considering the nature and objective of the research, a quantitative research approach was adopted. The collected data from a sample size eight commercial banks over the period of 2013 to 2017were analyzed using descriptive statistics, correlation matrix and multiple linear regression analysis. The analyses were made in accordance to the stated hypotheses formulated in the study.

In order to conduct the empirical analysis dependent variable (profitability measured by ROA), and independent variables were selected; capital adequacy, operational efficiency; liquidity risk; bank size and concentration. To comply with the objective of this research, the paper used quantitative research method. The quantitative data were mainly obtained from the banks themselves, from financial statements of banks and NBE through documentary analysis in order to identify and measure the factors of banks profitability. In specific, multiple regression analysis is adopted to measure the effect of factors profitability banks quantitatively.

First, among the bank specific variables as expected, the result showed a positive relationship between capital adequacy and profitability with strong statistical significance. The coefficient for the ratio; capital adequacy is the fourth highest positive, showing that an increase in capital strength will result in increased profitability. This is in line with the expectation as a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability.again as expected, the result showed a negative relationship between operational efficiency and profitability with strong statistical significance. This shows that as minimizing commercial banks operating costs in Ethiopia would certainly improve the banks

performance. They are expected the liquidity risk has a negative impact on ROA with strong insignificance coefficient. This indicates that as banks that hold more liquid asset experience less insignificant increase in profitability. The natural logarithm of total assets has a positive impact on ROA with strong significance coefficient. This indicates that as larger banks of the country experience more significant increases in profitability through economies of scale.

5.2 RECOMMENDATIONS

In order to hold up risky surprises and maintaining financial stability, it is vital to identify the factors that mostly influence the overall performance of profitability commercial banks. Therefore, based on the findings of the study the following possible recommendations were forwarded: capital adequacy, operational efficiency, Bank size are significant key internal drivers of profitability of commercials banks in Ethiopia. Indeed focusing and reengineering the institutions alongside these indicators could enhance the profitability as well as the performance of the commercial banks in Ethiopia. The explanatory powers of bank-specific variables are far more important in explaining the variability in ROA for commercial banks in Ethiopia than external variables. But among the external factors included in this study liquidity risk and concentration exists as insignificant key drivers of profitability of commercial banks. As far as lack of innovative products and fear of risky investments by profitability banks themselves are also factors that can affect commercial banks profitability negatively commercial banks should try their best in order to provide new banking services and to participate in risky investment areas which may in turn increases their profitability significantly.

Finally, the study sought to investigate the factors that influence profitability of commercial banks in Ethiopia. However, the variables used in the statistical analysis did not include all factors that can affect commercial banks profitability.

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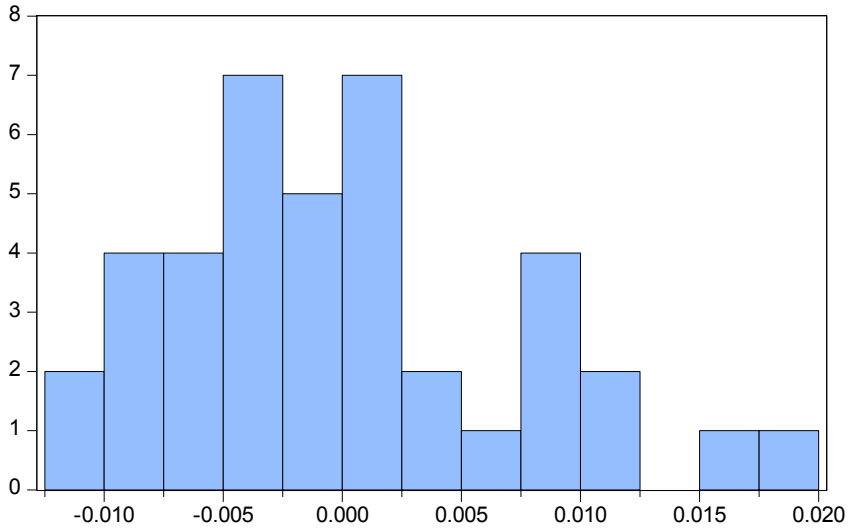
APPENDIX

Table 4.1.1 Heteroscedasticity Test: White

F-statistic	0.415731	Prob. F(15,24)	0.9592
Obs*R-squared	8.249733	Prob. Chi-Square(15)	0.9134
Scaled explained SS	8.243162	Prob. Chi-Square(15)	0.9137

Appendix: 4. 2 Normality Test For Residuals



Series: Standardized Residuals
Sample 2013 2017
Observations 40

Mean	-1.49e-17
Median	-0.000920
Maximum	0.018020
Minimum	-0.011729
Std. Dev.	0.007207
Skewness	0.625876
Kurtosis	2.918784
Jarque-Bera	2.622461
Probability	0.269488

Descriptive Statistics

	ROA	CA	OPE	LR	SIZE	CONC
Mean	0.027333	0.16	2.128538	0.63075	3.787516	0.73356
Median	0.0271	0.15	1.5199	0.635	3.861728	0.7454
Maximum	0.0468	0.27	23.1055	0.89	4.340502	0.7851
Minimum	0.0032	0.09	0.6521	0.47	2.9154	0.6898

Std. Dev.	0.008848	0.042607	3.454084	0.074193	0.347433	0.038168
Observations	40	40	40	40	40	40

Correlation matrix of dependent and independent variables

	ROA	**CA**	**OPE**	**LR**	**SIZE**	**CONC**
ROA	1	0.413805	-0.55984	-0.08804	-0.2338	0.108465
CA	0.413805	1	-0.23858	-0.00162	-0.76635	0.21899
OPE	-0.55984	-0.23858	1	0.159098	0.127913	-0.20732
LR	-0.08804	-0.00162	0.159098	1	0.284161	-0.3468
SIZE	-0.2338	-0.76635	0.127913	0.284161	1	-0.51075
CONC	0.108465	0.21899	-0.20732	-0.3468	-0.51075	1

Regression analysis results

ROA=β0+β1CAP+β2OPE+β3LIQ+β4 Bs+β5Conc+ε.

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 05/27/19 Time: 10:49
Sample: 2013 2017
Periods included: 5
Cross-sections included: 8
Total panel (balanced) observations: 40
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.071566	0.061285	-1.167742	0.2510
CA	0.177620	0.058258	3.048837	0.0044
OPE	-0.001237	0.000310	-3.992227	0.0003
LR	-0.009053	0.015963	-0.567117	0.5744
SIZE	0.015800	0.008434	1.873509	0.0696
CONC	0.025871	0.039386	0.656859	0.5157

Effects Specification	S.D.	Rho

Cross-section random		0.004417	0.3733
Idiosyncratic random		0.005723	0.6267
	Weighted Statistics		
R-squared	0.484199	Mean dependent var	0.013703
Adjusted R-squared	0.408346	S.D. dependent var	0.007877
S.E. of regression	0.006059	Sum squared resid	0.001248
F-statistic	6.383391	Durbin-Watson stat	1.566337
Prob (F-statistic)	0.000279		
	Unweighted Statistics		
R-squared	0.336615	Mean dependent var	0.027333
Sum squared resid	0.002025	Durbin-Watson stat	0.965286

Appendix: Raw Data

Code	company	Year	ROA	CA	OPE	LR	SIZE	Conc
1	UB	2013	0.0214	0.12	1.6495	0.58	3.9990435	0.7851
1	UB	2014	0.0166	0.13	2.0212	0.57	4.0746837	0.7569
1	UB	2015	0.0195	0.12	2.0966	0.58	4.1571808	0.7454
1	UB	2016	0.0196	0.12	2.1215	0.65	4.2372891	0.6906
1	UB	2017	0.0174	0.11	2.3245	0.73	4.340502	0.6898
2	NIB	2013	0.0326	0.18	0.9197	0.68	3.9611837	0.7851
2	NIB	2014	0.0276	0.18	0.9293	0.68	4.0312986	0.7569
2	NIB	2015	0.0254	0.16	1.3857	0.71	4.1224164	0.7454
2	NIB	2016	0.0246	0.16	1.4025	0.6	4.1994913	0.6906
2	NIB	2017	0.0324	0.14	1.0791	0.65	4.3226267	0.6898
3	CBO	2013	0.0312	0.11	0.9243	0.47	3.8155113	0.7851
3	CBO	2014	0.0466	0.15	0.8917	0.67	3.8663464	0.7569
3	CBO	2015	0.0272	0.12	1.9459	0.89	4.0592604	0.7454
3	CBO	2016	0.0032	0.11	23.1055	0.69	4.0263698	0.6906
3	CBO	2017	0.0144	0.09	3.3326	0.68	4.2485617	0.6898
4	LIB	2013	0.0377	0.18	0.8198	0.63	3.4686427	0.7851
4	LIB	2014	0.0268	0.17	1.4536	0.57	3.557868	0.7569
4	LIB	2015	0.0256	0.14	2.0388	0.64	3.7678235	0.7454
4	LIB	2016	0.0241	0.13	2.2477	0.68	3.9095148	0.6906
4	LIB	2017	0.0244	0.13	1.6801	0.63	4.0404409	0.6898
5	ZB	2013	0.0289	0.15	1.9255	0.55	3.511616	0.7851
5	ZB	2014	0.0468	0.17	0.6521	0.47	3.5938397	0.7569
5	ZB	2015	0.0313	0.16	1.0784	0.56	3.6878855	0.7454
5	ZB	2016	0.0275	0.14	1.1182	0.59	3.8677031	0.6906

5	ZB	2017	0.0368	0.14	0.8848	0.54	3.9853816	0.6898
6	AB	2013	0.0194	0.17	2.3684	0.57	3.2902573	0.7851
6	AB	2014	0.018	0.14	2.6828	0.59	3.5047127	0.7569
6	AB	2015	0.0273	0.16	1.7728	0.64	3.6610731	0.7454
6	AB	2016	0.0237	0.15	1.9955	0.64	3.7915945	0.6906
6	AB	2017	0.0288	0.15	1.5281	0.62	3.9357193	0.6898
7	AIB	2013	0.0299	0.27	1.42	0.58	2.9153998	0.7851
7	AIB	2014	0.0356	0.25	1.3333	0.64	3.1013071	0.7569
7	AIB	2015	0.0339	0.26	1.5117	0.69	3.2342591	0.7454
7	AIB	2016	0.0334	0.26	1.4439	0.67	3.3913198	0.6906
7	AIB	2017	0.027	0.22	1.8536	0.69	3.5333398	0.6898
8	BrIB	2013	0.0241	0.17	0.9475	0.61	3.3418301	0.7851
8	BrIB	2014	0.016	0.19	2.5807	0.59	3.4491697	0.7569
8	BrIB	2015	0.0248	0.17	1.5619	0.61	3.6203381	0.7454
8	BrIB	2016	0.0369	0.15	1.1245	0.71	3.8571093	0.6906
8	BrIB	2017	0.0449	0.18	0.9882	0.69	4.0207291	0.6898