ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF COMMERCIAL BANKS' PERFORMANCE IN ETHIOPIA

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ID. SGS1/0117/2004

OCTOBER, 2013
ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

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ACKNOWLEDGEMENTS

LIST OF ABBREVIATIONS AND ACRONYMS

ROA	Return on Average Asset
ROE	Return on Average Equity
NIM	Net Interest Margin
CAR	Capital adequacy ratio
CIR	Cost to income ratio
DIV	Diversification
LIQ	Liquidity
LDR	Loan Deposit Ratio
HHI	Herfindahl-Hirschman Index
SBS	Size Bank System
GDP	Gross Domestic Product
INF	Annual Inflation
ECB	European Central Bank
NBE	National Bank of Ethiopia

ABSTRACT

The study was carried out to empirically explore the bank specific, industry specific and macroeconomic determinants of Ethiopian commercial banks' performance using unbalanced 10 years (2003-2012) annual audited financial statements of 16 banks and macroeconomic data. It covers 100% of the population (commercial banks in Ethiopia) which are operating full years in the study period. The study used three indicators of profitability as dependent variables: Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) and ten explanatory variables: Bank Size, Capital adequacy, Operational efficiency, Liquidity risk, Income Diversification, and Loan to Deposit Ratio from bank specific factors, Bank Concentration and Size Bank System from industry specific factors and Real GDP Growth rate and Annual Inflation Rate from macroeconomic factors. Fixed effect was used for the ROA model, and Random effect for ROE and NIM models based on Hausman test.

The empirical result revealed that all bank specific factors except Loan to Deposit Ratio are statistically significant in determining profitability of Ethiopian commercial banks. Among them Cost Income Ratio and Liquidity negatively affect bank performance. There are also significant associations between Concentration and Size Bank System with profitability. However, no evidence is found about the relation between macroeconomic factors and performance of banks. In general, the overall empirical findings provide evidence that the profitability of Ethiopian commercial banks are mainly dominated by bank-specific factors which are on the hands of the management of the banks. So, the study suggests to the banks' managers and policy makers to give high concern on the internal factors of profitability and set direction to manage the most dominant factors of performance.

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CHAPTER ONE

INTRODUCTION

1.1 Back ground of the Study

Financial institutions are institutions that provide financial service for its clients or members. The most important financial service provided by financial institutions is rendering service as intermediaries to facilitate the flow of money through the economy. One of the most important financial intermediaries is banking[1] industry.

The solidity and augmentation of any economy to a great extent depend on the stability of its banking sector. In other word a well-established, responsible and profitable banking sector is better able to contribute to the stability of the financial system in the country. If the banking industry does not perform well, the effect to the general economy of the country could be huge and broad due to the fact that banks are the critical part of financial system and play a pivotal role in contributing to a country's economic development (Said and Tumin, 2011).

Today, the bank performance has become a favorite subject for many stakeholders such as customers, investors, government and the general public. A stable and efficient financial system represents efficient allocation of resources and becomes the foundation of rising of financial performance of an organization which leads to achieve their ultimate objectives (Raza et al, 2011). Banks' regulatory authorities are directly liable to evaluate the performance of each banking business and they should have to sense any

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[1] origin of the word bank can be traced as Banck in German to mean joint stock fund, Banco in Italian to mean heap of money, Banco/Banque in France to mean bench/chest a place where valuables are kept, and Bank in English as an institution money as deposit for lending (K.P. kandasami,2003)

future challenges regarding the performance of all banks. Therefore, beside asked for specific statements highlighting the performance of financial operation for evaluating banking industry, onsite inspection and critical studies are required to find out the accuracy and to judge on the stand of their performance (Iqbal, 2012).

According to previous studies, determinants of profitability are categorized into two main groups: external and internal. The Internal determinants are also sometimes called microeconomic determinants or inherent performance which are specific to each bank and that, in many cases, are the direct result of managerial decisions, so such management effects will definitely affect the operating result of banks. External determinants, on the other hands, are variables that reflect economic and legal environment which are out of the control of the management of the banks. They are again grouped in to two parts as factors relating to the industry structure and to the macroeconomic environment within which the banking system operates.

Many studies have attempted to explain the contribution of a particular variable on the performance of banks. It should be noted that very often, the authors found different results even contradictory Rao & Tekeste (2012), Ameur and Mhiri (2013), Ongore and Gemechu (2013), Alper and Anbar (2011), Athanasoglou, et. al.(2005), Alexiou and Sofoklis (2009), Sufian and Chong (2008). This is mainly due to the different data they use, which covers different areas and periods. Thus, some authors have studied the performance data from several countries, such as Athanasoglou et Al. (2006) Molyneux &Thornton (1992), Flamini et al. (2009) and Goddard et al. (2004). And others are studied in specific countries such as, Ameur et al. (2013), Dietrich and Wanzenried (2011), Guru et al. (1999). This paper focused on identifying explanatory factors that affect the performance of commercial Banks operating in Ethiopia.

1.2 Background of Banking Industry in Ethiopia

The Ethiopian financial system consists of the National Bank of Ethiopia that is responsible to regulate the whole banking system, Commercial Banks (government and domestic private banks), Insurance Companies (government and domestic private), a Public pension scheme, a Savings & Credit Co-operations, Micro Finance Institutions, T-bills and bonds markets, re-discount facility for government papers, inter-bank money and forex markets, and a large number of Iqubs (Weeks et al, 2004).

Bank of Abyssinia, the first modern bank in Ethiopia, was inaugurated on Feb.16, 1906 following the agreement between the Ethiopian Emperor Minelik II and Mr.Ma Gillivray, a representative of the British owned National Bank of Egypt. Bank of Abyssinia was formally replaced by Bank of Ethiopia shortly after Emperor Haile Selassie came to power. The new Bank, Bank of Ethiopia, was a purely Ethiopian financial institution and was the first indigenous bank in Africa and established by an official decree on August 29, 1931. During the Italian invasion the bank was closed and several Italian banks opened branches in Ethiopia. The State Bank of Ethiopia was established in 1943, after Ethiopia regains its independence from fascist Italy, and in 1963 the bank legally separated as National Bank of Ethiopia and Commercial Bank of Ethiopia. In the period up to 1974, several other state owned as well as private financial institutions emerged (Weeks et.al, 2004)

In 1975, following the fall of the imperial government, there was a major change of economic strategy in the banking sector. All privately owned banks were nationalized and concentrated into Commercial Bank of Ethiopia. After the socialist regime was overthrown in 1991, the licensing and supervision of

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Banking Business Proclamation No. 84/1994 was issued in 1994 which led to the beginning of a new era for Ethiopia banking sector. Immediately, after the enactment of the proclamation, the private banking companies re-emerged and that leads to have 16 registered private banks and 3 public owned banks operating in Ethiopia as of the current year 2013 (NBE, 2013).

The Ethiopian banking structure is still characterized by concentration in terms of ownership (dominated by the state owned banks), asset portfolio (largely CBE), and geographic distribution of financial institutions (mostly in major urban centers). It is also characterized by noticeable absence of certain types of financial institutions/markets such as investment banks, venture capital markets, private securities market (corporate bonds and stocks), and re-insurance companies. The country's financial policy reserves the financial sector for Ethiopian nationals (Weeks et al. 2004).

Table 2.1 List of commercial banks in Ethiopia

No	Private Commercial Bank	Establishment Year
1	Commercial Bank of Ethiopia	1963
2	Construction and Business Bank	1975
3	Awash International Bank	1994
4	Dashen Bank	1995
5	Abyssinia Bank	1996
6	Wegagen Bank	1997
7	United Bank	1998
8	Nib International Bank	1999
9	Cooperative Bank of Oromia	2004
10	Lion International Bank	2006
11	Oromia International Bank	2008
12	Zemen Bank	2008
13	Bunna International Bank	2009
14	Birhan International Bank	2009
15	Abay Bank	2010
16	Addis International Bank	2011

Source: (NBE, 2013)

1.3 Statement of the Problem

To achieve the vision of Ethiopian growth plan to become a middle-income level country, it is vital for the banking industry to develop a safe, efficient and reliable infrastructure that enhance the effectiveness of monetary policy and broad access of financial services to the public. The banking sector is an indispensable financial service sector supporting development plans through intermediating flow of funds from those who have surplus capital to deficit units and supporting financial and economic government policies. Through loans and investments, banks promote economic development, job creation, and easy transfer of funds between individuals or businesses. Banks are, in effect, a community's economic engine (Hoenig, 2010).

A single bank is highly connected with other banks for payment system and/or other various functions. The failure of a single bank not only affects its shareholders and depositors rather it also affects the performance of other banks and the whole economy of the country. The recent global recession can be taken as an example of economic disaster that occurred by the failure of banking business. So, the government of any country must have a high concern about the performance of banks.

Profitability is critical for a bank to maintain continuing activity, for its shareholders to acquire fair returns, and for supervisors as it guarantees to make sound decision, even in the context of a riskier business environment. Profitability is a shock absorber against unexpected losses due to the fact that it strengthens its capital position and improves future profitability through the investment of retained earnings.

Profit is the essential prerequisite for survival in a competitive banking institution. Since the basic aim of every bank management is to maximize profit, understanding the real factors that affect the banks performance should be known by a concerned body. Besides making profit, a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Harker and Zenios (1998) report shows that the bank performance is a function of its strategic choices, strategy execution, quality of services, and the environment. Accordingly, profitability difference for those banks operating in similar macroeconomic environment can be assured through the success of their competitive strategies and other managerial procedure. Comparative advantages, therefore, may arise from the bank's size, asset growth, and risk management quality, market share, ownership structure, and concentration index. Thus, these explanatory variables of banks' performance should be extracted in empirical researches. That is why the determinants of bank performance have attracted the interest of academic research as well as of bank management, and bank supervisors.

In this paper, bank performance, in view of profitability, is measured by Return on Asset, Return on Equity and Net Interest Margin. Based on previous studies on the area, bank-specific, industry-specific and microeconomic variables such as, bank size, capital adequacy, expenses management, liquidity risk, income diversification, concentration, bank size system, inflation, and economic growth are incorporated.

For all the aforementioned reasons, like limited stock of knowledge on determinants of bank profitability, the lack of consensus in the banking literature on the factors that affect bank profitability, this study contributes its share to the literature in general and the development and growth of the

banking sector of Ethiopia in particular by identifying the key factors that affect the profitability of Ethiopian commercial banks.

So the purpose of this paper is to investigate the effect of bank-specific, industry specific and macroeconomic factors on Ethiopia's bank performance.

1.4 Research Questions

The main research question is: what factors determine financial performance of commercial banks in Ethiopia.

The specific questions are:

➢ What bank specific factors determine the performance of commercial banks in Ethiopia?

➢ What industry specific factors determine the performance of Ethiopia commercial banks?

➢ What macroeconomic factors determine the performance of Ethiopia commercial banks?

1.5 Objectives of the Study

General objective:

The main objective of the study is to examine bank-specific, industry-specific and macroeconomic determinants of commercial banks performance in Ethiopia.

Specific Objectives

➢ To examine the significance of bank size on performance of commercial banks

➢ To detect the relationship between capital adequacy and performance of commercial banks

➢ To identify the impact of operational efficiency on performance of commercial banks

➢ To investigate liquidity influence on the performance of commercial banks

➢ To evaluate the linkage between Loan to Deposit ratio and banks performance

➢ To find out the correlation between income diversification and banks performance

➢ To distinguish the relation between concentration and banks performance

➢ To verify the effect of bank size system on the performance of commercial banks

➢ To confirm the attachment of inflation on the performance of commercial banks

➢ To discover the effect GDP growth rate on performance of commercial banks

1.6 Hypothesis

H1: There is a positive significant relationship between bank size and performance of Ethiopian commercial banks.

H2: There is a positive significant relationship between capital adequacy and performance of Ethiopian commercial banks.

H3: There is a negative significant relationship between operational efficiency (cost income ratio) and performance of Ethiopian commercial banks.

H4: There is a negative significant relationship between liquidity and performance of Ethiopian commercial banks.

H5: There is a positive significant relationship between income diversification and performance of Ethiopian commercial banks.

H6: There is a positive significant relationship between loan deposit ratio and performance of Ethiopian commercial banks.

H7: There is a positive significant relationship between concentration and performance of Ethiopian commercial banks.

H8: There is a positive significant relationship between bank size system and performance of Ethiopian commercial banks

H9: There is a negative significant relationship between inflation and performance of Ethiopian commercial banks.

H10: There is a positive significant relationship between GDP growth and performance of Ethiopian commercial banks.

1.7 Significance of the Study

Significance of study is an important part of the research as it exhibits the relevance of the study. Identifying bank performance determinant factors is vitally important for all stake holders, such as the owners, the investors, the debtors, the creditors and depositors, the managers of banks, the regulators and the government. It gives direction to the debtors and the investors to make decision whether they should invest money in bank or invest somewhere else. It also flashes direction to bank managers whether to improve its deposit service or loan service or both to improve its finance. Regulatory agencies and government are also interested in financial performance for the regulation purposes. In general, the paper may have important practical implication for banks to find out what determinants of profitability are crucial so that any concerned bodies can take initiatives in

managing the dominant determinants. It is also used as a starting point for further study conducted on banking performance with different technique.

1.8 Delimitation/Scope of the Study

The scope of the study is confined to all banks registered in Ethiopia as commercial banks within the study period. Performance of banks can be expressed in terms of competition, concentration, efficiency, productivity and profitability, but in this study performance is defined as profitability. Therefore, measuring performance (profitability) is delimited to three indicators- return on asset, return on equity and net interest margin-, and ten variables. The reason for the restriction of variables to ten is that the focus of most literatures lays on them and the availability of data, for instance, the study excludes credit risk due to confidentiality of data on non performing loan or provision for loan loss.

1.9 Organization of the Paper

This paper consists of five chapters with different sections and sub-sections, and it was structured as follows. Chapter one presents the introduction for the main part of the paper. Chapter Two reviews the most significant analytical and empirical studies. Chapter three focuses to present the methodology of the study. Chapter four also provides the analysis of results and discussion. Chapter five, as usual, gives conclusion and recommendation with policy implication and further research direction.

CHAPTER TWO

LITERATURE REVIEW

2.1 Analytical Literature

2.1.1 Bank performance

Better bank performance increases the reputation and image from public or market point of view. The economic literature pays a great deal of attention to the performance of banks, expressed in terms of competition, concentration, efficiency, productivity and profitability (Bikker and Bos, 2006). The key driver of banks' performance remains earnings, efficiency, risk-taking and leverage (ECB, 2010). A comprehensive and commonly accepted determinant of performance for financial institutions like banks does not exist in the literature. Instead, different researchers have attempted to estimate empirical factors affecting the performance of banks using financial data.

Bank management is mainly profit-driven. Profitability is an indicator of the bank's competitive position in banking markets and of the quality of its management, ensuring the health of the banking system. Profitability is also considered as a bank's first line of defense against unexpected losses, as it strengthens its capital position and improves future potentials through the investment of retained earnings (ECB, 2010). Profitability is the efficiency of banks at generating earnings which will be measured by profitability ratios and banks, therefore, earn profit by acquiring funds at a cost from severs and lending those funds to borrowers by charging customers for providing various services (Hubbard, 2002)

Determinants of bank performance are categorized as bank-specific, industry-specific and macroeconomic factors. Bank specific indicators include: bank size, capital adequacy, operational efficiency, liquidity, loan deposit ratio, and income diversification. The common measure for industry-specific representative used in the various studies is bank-concentration and bank size system. The key macroeconomic variables, on the other hand, include growth in GDP and inflation.

2.1.2 Bank Performance Indicators.

Bank performance proxy measures are different in various literatures. In most banking literature, such as Rao & Tekeste (2012), Ongore and Gemechu (2013), Alper and Anbar (2011), Athanasoglou, et. al., (2005), Alexiou and Sofoklis (2009), and Sufian and Chong (2008), on the issue of investigating the factors that influence the performance of the bank are most commonly employed one or two or all of the three alternative measures (ROA, ROE and NIM) were used. All these three standard measures of profitability are considered under this study on the basis of annual accounting data similar to the approach followed by (Ameur and Mhiri, 2013). Each ratio looks at a slightly different aspect of bank profitability (Athanasoglou, 2006)

Return on Asset

ROA is one of the major ratios that indicate the profitability of a bank and it has emerged as the key ratio for the evaluation of bank profitability and has become the most common measure of bank profitability in the empirical literature Rao & Tekeste (2012), Alkhatib, (2012), Alexiou and Sofoklis (2009), and Ana et. al. (2011). The ROA is defined as the ratio of net profits to total assets. It measures the ability of a bank's management to generate income by utilizing the company assets although it may be misleading due to off-balance-sheet activities (Athanasoglou, 2006, Dietricha and Wanzenriedb,

2009). In other words, it shows how efficiently the resources of the company are used to generate profit. A higher ROA shows that the company is more efficient in using its resources.

Return on Equity.

The other financial ratio to measure the bank performance is ROE that reflects how much profit a bank earned compared to the total amount of shareholder equity invested or found on the balance sheet and it measures how effectively a bank management is using shareholders' funds. The ROE is defined as the ratio of net profits to total equity. A business that has a high return on equity is more likely to be one that is capable of generating cash internally. Thus, the higher the ROE the more effective the management in utilizing the shareholders capital and the better the company is in terms of profit generation.

ROE is the product of ROA and assets-to-equity ratio (equity multiplier that measures financial leverage). Essentially the ROE–ROA relationship clearly illustrates the fundamental tradeoff that banks face between risk and return, whereas the equity multiplier reflects the leverage or financing policies, i.e. the debt-equity proportion that the bank management used to fund the bank. Athanassoglou, (2005) argues that an analysis based on ROE disregards the risks associated with leverage, often a consequence of regulation. On the other hand, Staikouras and Wood (2011) employ ROE as an appropriate profitability measure, arguing that for many European banks the off-balance-sheet business makes a significant contribution to total profit. The earnings generated from these activities are excluded from the denominator of ROA.

According to Rivard and Thomas (1997), bank profitability is best measured by ROA for two primary reasons. One first reason is that ROA is not distorted by high equity multipliers and the second one is that ROA reflects a

better measure of a bank's ability to generate returns on its assets. Moreover, ROA takes in to consideration the disparity in the absolute magnitude of the profits that may be related to size (Guru et al, 1999).

Net Interest Margin

Finally, the NIM variable focuses on the profit earned on interest activities. It is defined as the net interest income divided by total earning assets which contained Deposit with foreign Banks, Treasury Bills, Other Investments/bonds, Sundry Debtors & Other debit balances, and Total Loans Advances. It measures the difference between the interest income generated by banks and the amount of interest paid on borrowed funds, relative to the amount of their (interest earning) assets. It means that NIM measures the gap between the interest income the bank receives on loans and securities and interest cost of its borrowed funds with respect to the average amount of the assets on which earned income is generated in that time period. While the ROA measures the profit earned on assets and reflects how well bank management uses the bank's real investment resources, the NIM focuses on the profit earned on lending, investing and funding activities. It reflects the cost of bank intermediation services and the efficiency of the bank. The higher the net interest margin, the higher the bank's profit and the more stable the bank is. However, a higher net interest margin could reflect riskier lending practices associated with substantial loan loss provisions.

The problem that may encounter on the financial ratios particularly with ROA and ROE is that the total values of assets and equity may not remain constant overtime, so computing the ratios only by the ending balance of total asset or equity may not be justifiable. Hence, average values of consecutive year-end balance sheet figures are normally used to capture changes in assets during the fiscal year. Thus, following the footpaths of previous studies (Kosmidou, 2008; Dietrich and Wanzenried, 2009) and taking into account the

profitability measures of commercial banks used by NBE, Return on average asset and Return on average equity are used to measure the profitability of the commercial banks in the study.

Literatures, in calculating ROE and ROA, differ in using pre-tax and post-tax profits. Some sticks on before tax profit especially in the study of cross country banks performance/profitability analysis due to different taxation policy employed in different country. However, in studies that are limited to the boundaries of one nation, the choice between pre-tax and post-tax profits may not be very important because all the banks will be required to pay tax as per the country's corporate tax law which is equally applicable to all the banks (Guru et.al., 1999). Therefore, since the commercial banks operating in Ethiopia are also subject to the same tax law, the profit after tax (net profit) has been used as numerator in computing the ROA.

The paper attempted to examine the impact of an extended number of factors that are distinguished as internal and external determinants on banks performance. The selection criteria of these variables are based on the results of existing empirically studies that shows significant influence of performance and the availability of each variable data.

2.1.3 Bank Specific Variables

Bank Size

Bank size is measured by the natural log of total assets. Size is included in the regression as a proxy of bank size to capture the possible cost advantages associated with the economies of scale. In the literature, mixed relationships are found between size and profitability. Large banks are likely to have an advantage of engaging in higher investment diversification than small banks.

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Since this diversification reduces risks and economies of scale lead to increase operational efficiency through minimizing costs, positive relationship is expected between bank size and profitability (Rao & Tekeste, 2012 and Alper and Anbar, 2011. On the other hand, in the diversification of bank branches, for instant, the operational expense may get higher and the variable may exhibit negative effects Ameur and Mhiri, 2013 and Sufian and Chong, 2008. The impact of bank size on its profitability cannot be theoretically anticipated (Ongore, and Kusa, 2013; Dietricha and Wanzenriedb, 2009). Hence, the expected sign of the coefficient of bank size is unpredictable based on academic literature. This analysis used the logarithm of total asset to capture the potential non-linear effect of size similar to Athanasoglou et al. (2008) Alexiou and Sofoklis (2009).

Capital Adequacy (CAR)

Capital adequacy (Equity-Asset Ratio) reflects the capital strength or capital structure of a bank. It is one of the bank specific factors that influence the level of bank profitability. Strong capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis and it increases safety for depositors during unstable macroeconomic conditions. Large size of equity is expected to reduce the bank risk and increases a bank's creditworthiness in reducing its funding cost for a bank with higher equity to assets ratios will normally have a lower need of external funding. However, lower capital ratios in banking imply higher leverage and risk, which therefore lead to greater borrowing costs. CAR variable is included in the regressions to examine the link between profitability and bank capitalization (Dietricha and Wanzenriedb, 2009). Most literatures results show that it has positive relationship with profitability (Rao & Tekeste, 2012; Ameur and Mhiri, 2013; Ongore and Gemechu, 2013; Athanasoglou, et. al., 2005; and Sufian and Chong, 2008. On the contrary, some like Ayanda et. al. (2013)

revealed negative relations. Especially against ROE, it is expected to have a negative relationship due to dilution effect.

Operational Efficiency

Cost Income Ratio (CIR) reflect bank's operational efficiency and it is defined as non interest costs (operating cost, such as administrative costs, staff salaries and property costs excluding bad debts and doubtful expenses) divided by total of interest income and non-interest income (Dietricha and Wanzenriedb, 2009). CIR depicts the cost incurred per income generated. The study, therefore, used this variable to measure the impact of operational efficiency on bank profitability. CIR 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 (Guru et al. 2002). According to Athanasoglou et al. (2005) investigation on Greek banks during the period 1985 – 2001 observed that Operating expenses appear to be an important determinant of profitability. There is negative connection between operating expenses and profitability of banks; means that there is immediate negative relation between lack of efficiency in expenses management and profitability of banks. The study revealed that efficient expenses management was one of the most significant in explaining high bank profitability (Guru et al., 1999).

Liquidity Risk

Liquidity is measured by liquid asset to total asset ratio. Since insufficient liquidity is one of the major reasons of bank failures, in addition to the maintenance of cash reserve with the Central Bank, the commercial banks are also required to keep up a minimum level of liquid assets. Commercial banks may confront with liquidity deficit, when they face a problem of meeting a large amount of demand (withdrawals). In such a situation, banks may be

forced to raise additional liquid funds by borrowings or disposing some of their liquid assets. Usually, short-term borrowings are costly and the loss of income from the sale of liquid assets will tend to have an adverse effect on profitability. On the other hand, idle funds and the lower returns on liquid assets may also adversely affect the profitability of those banks with surplus liquidity. Therefore, liquidity may have a positive or a negative effect, and its management represents yet another important determinant of commercial bank profitability (Rasiah, 2010).

Income diversification (DIV)

Non-interest income is other alternative means of income other than earning from loans. Banks generate income from off-balance sheet such as from letters of credit and this non-interest income would represent a key source of bank revenue (Rasiah, 2010). Thus, the ratio of non-interest income over average assets is entered in the regression analysis as a proxy measure of income diversification onto non-traditional activities. Non-interest income consists of service charges, commission, guarantee fees, net profit from sale of investment securities, and foreign exchange profit. Thus, Bankers have found a promising channel for boosting the income statement by diversifying their income sources. The variable is expected to exhibit positive relationship with bank profitability.

Loan to Deposit Ratio (LDR)

Loans are the most important indicators of banks performance in the bank financial statements because they reflect the bank's primary activity. Assumed, other variables constant, the higher the rate of transforming deposits into loans, the higher the profitability will be. For that, a positive relationship between loan deposit ratio and banks profitability is expected. On the other hand, if increasing loans leads to higher funding requirements, a

negative impact of the loan ratio on the banks profitability may accrue Alexiou and Sofoklis (2009) and Ana et. Al.(2011).

2.1.4 Industry Specific Determinants

Concentration (HHI)

It measures the market structure in the banking industry by means of the bank concentration variable. Market concentration is measured by using the Herfindahl-Hirschman (H-H) index (Athanasoglou et al., 2005) or the ratio of the three largest banks' assets to the total assets of the entire banking sector. In this study market concentration is measured like the previous researcher (Athanasoglou et al., 2005) by using the Herfindahl-Hirschman (H-H) index, which is the sum of the squares of market share of the sample banks included in this particular study. The high concentration ratio in the market creates greater than average efficiency in these markets yielding a positive profit concentration relationship (Berger, and Hannan, 1989). In Ethiopia banking business environment study conducted by (Belayneh, 2011) indicated that the existence of negative and significant relationship between the declining market concentration and Ethiopian commercial banks profitability. it is expected that a higher bank concentration has a positive impact on profitability. On the other hand, a higher bank concentration might be the result of a tougher competition in the banking industry, which would suggest a negative relationship between performance and market concentration. As a result, the overall effect of market concentration on banking performance is again indeterminate.

Size Bank System (SBS): reflect the importance of bank financing in the economy and it is measured by the ratio of total assets of banks to GDP. Regarding to the bank size system, Demerguç-Kunt and Huizingha (1999)

provide the evidence that small size bank system allow to high margins and profits, when they explore the bank profitability of 80 countries over the 1988-1995 period. As well, BenNaceur (2003), reports that the growth of bank system does not necessary contribute to improve profitability of the banking sector in Tunisia.

2.1.5 Macroeconomic Determinants

GDP - is used to account for economic environment and it is measured by real GDP growth. GDP growth varies over time but not among the banks. GDP growth is expected to have a positive impact on bank profitability according to the literature on the association between economic growth and financial sector profitability (Demirguc-Kunt and Huizinga, 1999; Bikker, and Bos, 2006; Athanasoglou et al., 2006). Accordingly, we expect a positive relationship between bank profitability and GDP development as the demand for lending is increasing (decreasing) in cyclical upswings (downswings). However, BenNaceur and Goaid, (2005) suggest that GDP growth does not tell any characteristic of the banking regulation and the advanced technology in the banking sector. By the other side, Staikouras and Wood (2003) find two of their three macroeconomic indicators, the variability of interest rate and the growth of GDP, have a negative impact, while the level of interest rate have a positive effect on bank performance.

Inflation (INF): is also one of the microeconomic determinants and used to represent the changes in the general price level or inflationary conditions in the economy and it is measured by annual country inflation rate. Abreu and Mendes (2000), point out a negative relationship between the inflation rate and bank's profitability in European countries. Likewise Ayadi and Boujelbene (2012), report a negative effect of inflation on Tunisian bank profitability over the 1995- 2005 period. In the same way, Demirguc-Kunt

and Huizinga (1999) suggest that banks with high capital ratio in developing countries tend to be less profitable in inflationary environments.

Conceptual Framework

The conceptual schema of the relation between the independent variables and dependent variable distilled from the literature review is shown on figure 2.1 below. It assumes that the relationship between the independent variable and dependent variables is linear.

Figure 2.1: Schematic Diagram showing relationships between variables

Independent Variables

INDEPENDENT VARIABLES
➡ Bank-specific Factors
■ Bank Size
■ Capital adequacy
■ Operational efficiency
■ Liquidity Risk
■ Income diversification
■ Loan to Deposit Ratio

DEPENDENT VARIABLES
➡ Bank Performance
■ Return on Asset
■ Return on Equity
■ Net Interest Margin

INDEPENDENT VARIABLES
➡ Industry Specific Factors
■ Bank Concentration
■ Size Bank System

INDEPENDENT VARIABLES
➡ Macroeconomic Factors
■ Real GDP Growth
■ Annual Inflation

2.2 Empirical Literature

Rao & Tekeste (2012), conducted the research on the topic "Determinants of Profitability of Commercial Banks in a Developing Country: Evidence from Ethiopia" employing unbalanced panel data of Ethiopian commercial banks under the period 1999/00 to 2008/09. In the study return on average asset stands for bank profitability indicators, seven internal and three external factors were regressed against ROA of the banks. The finding of the study shows that the most important determinants of banks' profitability in Ethiopia are all the internal factors used in the study: equity to asset ratio, non-interest income to total income and bank size have positive and significant impact on the profitability, the loan loss reserve to total loans is found to have negative impact on profitability though it is statistically insignificant, liquidity and operational efficiency are also negatively affect the profitability of the banks. But the external factors (concentration, inflation and GDP) are found to be statistically insignificant. My study is different from the above one since it utilized a time period of 2003-2012.

Kapur and Abebaw (2012), conduct an empirical analysis on the impact of ownership structure on the performance of Ethiopian commercial banks with the sample of two public commercial banks and six private commercial banks under the period 2001 to 2008. To examine the relationship and to determine the different attributions of performance in their ownership patterns, the study used both parametric and nonparametric tests. The findings show that private sector banks had better profitability as measured by ROA and NIM than their public counterparts. The researchers, then, concluded that private sector banks are better in utilization of assets effectively and in generating profits from interest earning investments. In addition to profitability, private sector banks were significantly better in credit management, which demonstrates the efficiency in evaluating and deploying resources in good projects, than public owned banks. Capital adequacy that refers to the ratio of

capital to net loans (in this particular study) is also significantly better in private sectors showing the ability of private banks in meeting un-expected operational losses. On the other hand public banks were significantly better in cost management measures as they are able to keep the proportion of costs to assets lower than that of private sector banks. Besides in managing noninterest expenses and general and staff expenses Public sector banks were better than private one. However, in terms of liquidity, no difference was observed between the private and public sector banks. My study is different from the study by Kapur and Abebaw since it utilized a time period of 2003-2012 and considered 100% of the population.

The paper conducted by Ameur and Mhiri (2013), to identify the explanatory factors of banks' Performance on ten Tunisian commercial banks from 1998 to 2011 incorporate bank-specific, industry-specific and macroeconomic factors. The empirical result of the GMM estimator technique shows a high degree of persistence of bank performance. Thus, the findings suggest that the bank capitalization and the best managerial efficiency have a positive and significant effect on the Tunisian bank performance. However, concentration and bank size have negative a negative and a significant effect on performance. On the other hand, the macroeconomic variables do not have a significant effect on bank performance, except inflation which seems to affect negatively bank's net interest margin. Moreover, private owned banks seem to be more profitable than state owned ones.

Ongore and Gemechu (2013), used linear multiple regression model and Generalized Least Square on panel data to estimate the determinants of financial performance of commercial banks in Kenya. Their finding reveals that specific factors such as capital adequacy, asset quality and management efficiency significantly affect the performance of Kenyan commercial banks, except for liquidity variable. The relationship between bank performance and

capital adequacy and management efficiency was found to be positive and for asset quality the relationship was negative. But the overall effect of macroeconomic variables was inconclusive and the role of ownership identity on the financial performance of commercial banks was insignificant. Even if it is found that GDP has negative correlation with performance indicators, the relationship is insignificant.

Azam and Siddiqui (2012), applied multiple regression technique to analyze the internal and the external determinants of Pakistan banking industry. The study, on the purpose of comparing the profitability of domestic and foreign banks and analyzing their determinants under the period 2004 to 2010 (on quarterly basis), find that foreign banks are more profitable than all domestic banks, and they have also different profitability determinants. Empirical results show that foreign banks are less affected by the macroeconomic factors of the host country than domestic banks and they have a higher profitability margin in Pakistan. They conclude that local controlled commercial banks in Pakistan are more profitable than foreign controlled ones as far as the volume of the profit is concerned which is reflected in their earnings per share but the foreign controlled commercial banks in Pakistan, as a whole are more capital efficient as compared to the local controlled commercial banks subject to few exceptions.

Alkhatib, (2012), with the purpose to empirically examine the financial performance of five Palestinian commercial banks listed on Palestine securities exchange. In this paper, Financial performance has been measured by using three indicators; Internal–based performance measured by Return on Assets, Market-based performance measured by Tobin's Q model (Price / Book value of Equity) and Economic–based performance measured by Economic Value add. The study employed the correlation and multiple regression analysis of annual time series data from 2005-2010 to capture the

impact of bank size, credit risk, operational efficiency and asset management on financial performance measured by the three indicators, and to create a good-fit regression model to predict the future financial performance of these banks. The finding implies that operational efficiency and asset management individually have significant impact on ROA, when they used along with bank size and credit risk, they add significant effect on Tobin's Q and EVA.

San1 and Heng (2013), conducted the study aims to investigate the impact of bank-specific factors which include the liquidity, credit, capital, operating expenses and the size of commercial banks on their performance, which is measured by return on average assets (ROAA) and return on average equity (ROAE). The results imply that ratios employed in this study have different effects on the performance of banks in both China and Malaysia, except credit and capital ratios. Operating ratios influence performance of banks in China, but this influence is not true for Malaysian banks regardless of the measure of performance.

The study of Alper and Anbar (2011) focuses on the bank specific and macroeconomic determinants of Profitability in Commercial Bank of Turkey under the period 2002 to 2010. It uses ROA and ROE as dependent variables to examine the determinant of banks profitability. The finding the research reveals that asset size and non-interest income have a positive and significant effect on bank profitability. However, size of credit portfolio and loans under follow-up have a negative and significant impact on bank profitability. With regard to macroeconomic variables, only the real interest rate affects the performance of banks positively. These results suggest that banks can improve their profitability through increasing bank size and non-interest income, decreasing credit/asset ratio. In addition, higher real interest rate can lead to higher bank profitability.

The Greek banks working paper investigates the bank-Specific, industry-specific and macroeconomic determinants of profitability by using GMM technique to a panel data over the period 1985 to 2001 (Athanasoglou, et. al., 2005). In the study the profitability indicator is measured by two alternative as a dependent variables i.e. the ratio of profits to assets (ROA) and the profits to equity ratio (ROE).The results show that all bank-specific determinants, except size, affect bank profitability significantly as capital and labor productivity positive and operating expenses negative impact on profitability. The macroeconomic determinants: inflation and cyclical output also clearly affect the performance of the banking sector. Moreover, the industry specific factors: ownership and industry concentration are found insignificant. The effect of the business cycle is positively correlated to profitability only when output is above its trend. Even if this empirical framework incorporates the traditional Structure-Conduct- Performance (SCP) hypothesis, no evidence is found in support of the SCP hypothesis as the effect of industry concentration on bank profitability was found insignificant.

Other similar study on Greek banks was conducted by Alexiou and Sofoklis (2009) to examine the effects of bank-specific and macroeconomic determinants of Greek bank profitability, by assuming that the two broad sets of variables (ROA and ROE) that control bank profitability are a function of the specific sector as a whole as well as the macroeconomic environment within which the sector operates. A panel data approach was applied to six Greek banks using an empirical framework that incorporates the traditional Structure-Conduct- Performance (SCP) hypothesis. The finding suggests that most of the bank-specific determinants were significantly affect bank profitability. However, there is relatively weak relationship between size and profitability, and ambiguous picture were considered on macroeconomic factors.

Sufian and Chong (2008), look for the factors that influence the profitability of Philippines banking sector by using ROA as a dependent variables during the period 1990–2005. The empirical evidences suggest that all the bank-specific determinant variables have a statistically significantly impact on bank profitability. Among them size, credit risk, and overhead expensed are negatively affect the bank profitability, whereas non-interest income and capitalization have a positive impact on it. Concerning the macroeconomic factors, the findings show that except inflation which has a negative impact on bank profitability, GDP, the growth in money supply, and the level of stock market capitalization have not significantly explained the profitability of Philippines banks.

Ana et. Al. (2011) conduct research on the topic Determinants of Bank Profitability in Croatia with twofold objectives; to provide a synthesis of relevant empirical researches on the determinants of commercial banks' profitability and to establish empirical verification of profitability determinants of Croatian banks using dynamic panel analysis under the study period 2003 to 2008 on 28 commercial banks. Return on assets (ROA) is used as a proxy indicator to measure profitability in the analysis. The result of the study reveals that higher loan growth and equity financing, stable base of deponents, prudent credit risk and market risk management as well as the growth of fee based activities are comparative advantages of banks in Croatia in achieving extraordinary levels of return on assets. On the other hand, the average interest income and the average interest expense proved to be statistically insignificant.

Ayanda et. al. (2013) search for the determinant of Nigerian Banks' Profitability in the case of First Bank of Nigeria Plc by applying the econometric analysis of Co-integration and Error Correction Technique using annual time series data from 1980 to 2010. The empirical result shows that bank size and cost efficiency did not significantly determine bank

profitability in Nigeria. However, credit risk and capital adequacy had significantly negative effect on banks profitability both in the long-run and in the short run. Liquidity Risk which is, in the study, measured by Total Loans-to-Total Assets ratio and Total Loans-to-Total Bank Deposits ratio have significant negative and positive relationships with profitability respectively only in the short run. On the other hand among macroeconomic variables used in the study only money supply growth had a positively link with Nigerian bank profitability both in the long run and in the short run. However, no evidence was found for inflation rate and growth rate of real GDP determination of profitability.

CHAPTER THREE

Research Design and Methodology

3.1 Research design

The objective of the study is to investigate the determinants of commercial banks' performance in Ethiopian banking industry. Fixed effects, and random effects model were used after testing the validity of the assumption of the models by using the Hausman test for each three models (Brooks, 2008) by incorporating banks specific, industry specific and macroeconomic variables for time period of 10 years (2003 to 2012) on sixteen Ethiopian commercial banks.

3.2 Sample and Sampling Techniques

To detect the factors that affect the Ethiopian commercial banks performance, all commercial banks operating in Ethiopia are the population for the study. According to the National bank of Ethiopia, there are 19 licensed banks in the country. Development Bank of Ethiopia is out of commercial banks category because its mission is different from the conventional commercial banks. Thus from the remaining 18 commercial banks , Debub Global Bank and Enat Bank were excluded since there are new and have no data for the year 2012. Thus, the research includes all commercial banks operating in Ethiopia who have reported financial data up to the end of June 2012. This means that the study covers 100% of the population (commercial banks in Ethiopia) which are operating full years in the study period. Therefore, the study has a time series segment spanning from the period 2003 up to 2012 and a cross section segment which considered sixteen Ethiopian commercial Banks with unbalanced data of 111 observations.

3.3 Source and Tools/Instruments of Data Collection

The study used secondary data to investigate the bank specific, industry specific and macroeconomic determinants of the bank performance in Ethiopian commercial banks. Therefore, both the annual audited financial statements of the whole banks, which are consolidated on July 30 of each year and calculated in Ethiopian Birr, and the macroeconomic variables, were gathered from National Bank of Ethiopia.

3.4 Methods of Data Analysis

Quantitative methods of data analysis can be of great value to the researcher who is attempting to draw meaningful results on determinant factors on any subject area from a large body of data. Since quantitative data analysis methods have taken full advantage of user-friendly statistical packages such as, Eviews, SAS, SPSS and Stata, this study employed Stata for reporting the summary results in numerical terms with a specified degree of confidence.

3.4.1 Panel Data

Generally three types of data that are available for empirical analysis: (1) cross section, (2) time series, and (3) pooled data (Gujarati, 2004). Time series data, as the name suggests, are data that have been collected over a period of time on one or more variables. Cross-sectional data are data on one or more variables collected at a single point in time. Panel data have the dimensions of both time series and cross-sections (Brooks, C. 2008).

The term panel data refers to the pooling of observations of separate units (countries, banks, groups of people etc.) on the same set of variables over several time periods. Thus, the panel data analysis was adopted for

conducting our econometric modeling. Panel data are a special type of pooled data and it consists of observations on the same cross-sectional or individual units over several time periods. Panel data have, therefore, space as well as time dimensions. Using the panel data has several benefits along with certain limitations as well. Some of the Panel data techniques advantage over cross-section or time series data are panel data can take heterogeneity explicitly into account by allowing for individual-specific variables, give more informative data, more variability, less co-linearity among variables, more degrees of freedom and more efficiency. Panel data can capture and measure effects that are not detectable in cross-section time-series analysis, as well as provide a platform on which to test more complicated behavioral models (Gujarati, 2004). Panel data can be classified as balanced and unbalanced data sets. In this research unbalanced panel used because each cross-sectional unit of the study does not have the same number of time series observations due to difference in their date of establishment to absorb 10 years of data.

The most common technique in the literature is the Fixed Effects (FE) model. If it is assumed that εi and the X's are uncorrelated, Random Effect (RE) model may be appropriate, whereas if εi and the X's are correlated, FE may be appropriate. The FE model assumes that the marginal effects of the explanatory variables on the dependent unit are the same for all units (i.e. firms). The constant term is allowed to vary among the units to account for the differences between units. It has also been shown that the FE estimator is consistent even when the RE model is valid or even if the time-invariant component of the error term is correlated with the regressors (Johnston and Dinardo, 1997; Nguyen, J., 2006). As Gugarati (2004) cited Wooldridge who contends that in many applications, the whole reason for using panel data is to allow the unobserved effect [i.e., εi] to be correlated with the explanatory variables. Moreover, Brooks (2008) said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more

plausible when the entities in the sample effectively constitute the entire population. Therefore, given the above contention and the whole population are considered in this specific study, the fixed effects estimates would be the reference point in the study and then the discussion focuses on the results of the fixed effect model (ROA model).

3.4.2 Econometric methodology

3.4.2.1 Empirical Specification and Estimation

In this section, the methodology adopted for the empirical analysis to recognize the determinants of performance in Ethiopian bank is introduced. Accordingly, there is a need to estimate a relationship of the following form using the panel data consisting of sixteen banks' data across a period from 2003 to 2012. The model question is

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where, α represents the intercept, β_1, β_2 … β_n represent the respective regression coefficients for explanatory variables X_1, X_2 …X_n for estimating Y_{it}, the equation, then, can be written as;

$$Y_{it} = \alpha_i + \beta_1 BS_{it} + \beta_1 \, IndS_{it} + \beta_2 Macro_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots (2)$$

Where, Y_{it} is an index of Performance represented by ROA, ROE and NIM, BS is vector of bank specific variables, IndS is vector of industry specific variables and Macro is vector of macroeconomic variables that are believed to determine the level of performance. While α_i is unobserved macro, industry and bank specific time; invariant effect which allows for heterogeneity in the means of the Y_{it} series across banks and ε is the error term.

Then, the equation would be;

ROA Model: - Return on Average Assets as dependant variable

$ROA_{i,t} = \alpha + \beta_1 SIZE_{i,t} + \beta_2 CAR_{i,t} + \beta_3 CIR_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 DIV_{i,t} + \beta_6 LDR_{i,t} + \beta_7 HHI_t + \beta_8 SBS_t + \beta_9 INF_t + \beta_9 GDP_t + \varepsilon_{i,t}$.. (3)

ROE Model: - Return on Average Equity as dependant variable

$ROE_{i,t} = \alpha + \beta_1 SIZE_{i,t} + \beta_2 CAR_{i,t} + \beta_3 CIR_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 DIV_{i,t} + \beta_6 LDR_{i,t} + \beta_7 HHI_{i,t} + \beta_8 SBS_{i,t} + \beta_9 INF_{i,t} + \beta_9 GDP_{i,t} + \varepsilon_{i,t}$...(4)

NIM Model: - Net Interest Margin as dependant variable

$NIM_{i,t} = \alpha + \beta_1 SIZE_{i,t} + \beta_2 CAR_{i,t} + \beta_3 CIR_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 DIV_{i,t} + \beta_6 LDR_{i,t} + \beta_7 HHI_{i,t} + \beta_8 SBS_{i,t} + \beta_9 INF_{i,t} + \beta_9 GDP_{i,t} + \varepsilon_{i,t}$ ………………………………(5)

Where

$ROA_{i,t}$ = Return on Average Asset for bank i at time t

$ROE_{i,t}$ = Return on Average Equity for bank i at time t

$NIM_{i,t}$ = Net Interest Margin for bank i at time t

$SIZE_{i,t}$ = The natural logarithm of total asset for bank i at time t

$CAR_{i,t}$ = Capital strength for bank i at time t

$CIR_{i,t}$ = Cost to income ratio for bank i at time t

$DIV_{i,t}$ = Income diversification for bank i at time t

$LIQ_{i,t}$ = Liquidity risk for bank i at time t

$LDR_{i,t}$ = Loan Deposit Ratio for bank i at time t

HHI_t = Industry concentration at time t

SBS_t = Size Bank System at time t

$GDP_t,$ = Real GDP growth at time t

INF_t = Inflation rate at time t

ε_i = the error term

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Results

This chapter provides empirical evidence on the determinants of bank profitability in the Ethiopian Banking industry. The section has two parts: the result of descriptive statistics and the regression of the three models. At the first part a broad description of the characteristics of the variables used in the study is given in Table 1, which reports their statistical means, standard deviation, minimal and maximal level. Secondly the result of the regression for the return on asset, return on equity and net interest margin are stated in the consecutive tables.

4.1.1 Descriptive Statistics Results.

This part presents the outcomes of the descriptive statistics for main variables involved in the regression model. I introduce summary statistics for all variables in Table 4.1. The key figures; including mean and standard deviation with minimum and maximum value were reported. This was generated to give overall description about data used in the model.

Table 4.1 Descriptive Statistics of Variables

Variables		Obs	Mean	Std. Dev.	Min	Max
Dependent Variables	roa	111	2.483216	1.771959	-3.952926	6.717239
	roe	111	22.84898	14.82329	-20.20195	77.70969
	nim	111	4.276335	1.754202	.509554	10.78294
Bank Specific Factors	size	111	7.997515	1.337425	4.859812	11.97543
	car	111	.1568205	.1086271	.042525	.768217
	cir	111	48.10494	50.40102	13.46144	441.9355
	liq	111	41.36666	11.24477	15.80594	93.79845
	div	111	3.980383	1.971953	.031008	13.5371
	ldr	111	67.64045	19.67331	20	129.5918
Industry Specific Factors	hhi	111	.5158196	.0744845	.429344	.67345
	sbs	111	.0180599	.0063668	.011313	.029932
Macroeconomic Specific Factors	inf	111	17.96772	11.63648	2.8	36.4
	gdp	111	.0992781	.0372754	-.021611	.135724

Source: Computed by using Stata

As shown in the Table 4.1, the descriptive statistics of the study, there are 111 observations due to unbalanced data collected from sixteen commercial banks over the period 2003 to 2012. The mean for ROA, ROE and NIM are 2.483216, 22.84898 and 4.276335 percent, and the standard deviations are 1.771959, 14.82329 and 1.754202 percent respectively with a minimum of -3.952926, -20.20195 and 0.509554 percent, and a maximum of 6.717239, 77.70969 and 10.78294 percent respectively.

There are 10 independent variables used in this study. A natural log of total asset of the bank is used to represent the size of the bank with its mean and

standard deviation of 7.997515 and 1.337425 respectively. The mean and standard deviation of Equity to Total Assets ratio (CAR) are .1568205 and .1086271 respectively. Cost to Income ratio (CIR) which indicates the efficiency of expense management also obtained a mean of 48.10494 and a standard deviation of 50.40102. The liquidity aspect of the banks which measured as Liquid Assets to Total Deposits (LIQ) has a mean 41.36666 and a standard deviation of 11.24477. The loan deposit ratio and diversification also shows a mean of 67.64045 and 3.980383, and a standard deviation of 19.67331 and 1.971953. Concerning industry specific indicators the mean and standard deviation of concentration (HHI) are .5158196 and, .0744845, and that of bank size system is the mean of .0180599 and a standard deviation of .0063668. For macroeconomic variables, the mean of GDP and INF are .0992781 and 17.96772 respectively. The standard deviation of GDP and INF are .0372754 and 11.63648 respectively.

4.1.2 Regression

This section presents over all the empirical results of the regressions analysis for banks profitability which is measured by return on asset, return on equity, and net interest margin. They have been regressed to understand the bank specific, industry specific and macroeconomic determinants.

4.1.2.1 Choosing Models

There are broadly two classes of panel data estimator approaches that can be employed in empirical research: fixed effects models and random effects models. Before starting regression analyses to examine the relationship between bank performance measures and independent variables, it has to be decided that whether fixed or random effect is appropriate to the specific

model used. Therefore; the first issue is that choosing between fixed effects (FE) and a random effects (RE) model based on the Hausman test where the null hypothesis says that random effects model is appropriate than the fixed effects model.

Table 4.2 Hausman fixed random test for the model ROA as a dependent variable

```
                    ——— Coefficients ———
                    (b)          (B)         (b-B)       sqrt(diag(V_b-V_B))
                  fixed        random      Difference           S.E.

      size      1.150847      .5158086     .6350386          .4844933
       car      6.030426      2.394601     3.635825         1.335033
       cir      -.0109829    -.0165184     .0055355          .0018918
       liq      -.0428816     .0056993    -.0485809          .0066105
       div       .8192006     .4336048     .3855959          .0958114
       ldr      -.018925      .0126878    -.0316128          .0080801
       hhi      5.801168      2.918108     2.88306          1.528746
       sbs      -119.3277     .2157967    -119.5435         41.16126
       inf       .0185065     .0042562     .0142503             .
       gdp      3.476329      5.419356    -1.943027             .

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

    Test:  Ho:  difference in coefficients not systematic

              chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =       30.89
            Prob>chi2 =       0.0001
```

According to Chris brooks (2008), if the p-value for the Hausman test is less than 1%, indicating that the random effects model is not appropriate and that the fixed effects specification is to be preferred. Based on this fact, , p-value for the Hausman test was 0.001, i.e. less than 1%, so running fixed effect model is appropriate.

Table 4.3 Hausman fixed random test for the model ROE as a dependent variable

```
                    ─── Coefficients ───
                   (b)          (B)           (b-B)         sqrt(diag(V_b-V_B))
                  fixed        random       Difference             S.E.

      size       9.633509     9.751418      -.117909          4.586275
       car       1.620728    -8.531263      10.15199          14.94111
       cir        .0254741     .0194912       .0059829          .0250004
       liq       -.0959691    -.0045314      -.0914378          .0973301
       div       4.611166     2.58318        2.027987           .9473185
       ldr        .1398179     .1606946      -.0208766          .0892555
       hhi       44.15911     37.68209        6.477022        16.64158
       sbs     -276.8579     -98.13226     -178.7256          405.2326
       inf        .0208763    -.0553429       .0762191          .0352172
       gdp       39.04426     43.04849       -4.004226               .
```

```
                    b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

           chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                   =        1.89
           Prob>chi2 =      0.9293
```

According to Hausman test hypothesis if the p-value is greater than 1%, indicating that the random effects model is preferred to fixed effect specification.

Table 4.4 Hausman fixed random test for the model NIM as a dependent variable

```
                    ─── Coefficients ───
                   (b)          (B)           (b-B)         sqrt(diag(V_b-V_B))
                fixednim      randomnim     Difference             S.E.

      size       1.970114     .5669467      1.403167           .5339997
       car       9.130627    6.590998       2.539629           .5301938
       cir       -.0011558   -.0061835       .0050277           .0003
       liq       -.0430998   -.0175672      -.0255327                .
       div        .0478133   -.0392838       .0870971           .0769926
       ldr       -.0334709   -.0180047      -.0154662                .
       hhi       5.21051      .0652253       5.145285          1.780029
       sbs     -219.7433    -73.48826     -146.255            42.43996
       inf        .0403584    .0373781       .0029803                .
       gdp       1.846838    3.565032       -1.718194                .
```

```
                    b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

           chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                   =        6.31
           Prob>chi2 =      0.5035
```

According to Hausman test hypothesis if the p-value is greater than 1%, indicating that the random effects model is preferred to fixed effect specification.

4.1.2.2 Econometric Treatment

In order to determine the validity of the model, the presence of heteroscedasticity, autocorrelation, multicollinearity and normality tests were treated well.

i. Heteroscedasticity

The assumption for heteroscedasticity is that the variance of the errors is not constant across observation, thus, standard estimations will be inefficient. In other words, heteroscedastic occurs in a series of random variables only when the random variables have different variance. Furthermore, error term in each period is not constant because the estimator and error term is influence by each other.

The White's test is usually used as a test for heteroscedasticity. In this test, a regression of the squares of the residuals is run on the variables suspected of causing the heteroscedasticity, and cross products (Gujarati, 2004).

$$n*R^2 \ = \ \chi2 \ (n)$$

Number of observation is 111 and the R^2 for ROA, ROE and NIM are 0.715, 0.729 and 0.203 respectively and the calculated value will be 79.365, 80.919 and 22.533 for ROA, ROE and NIM. The $\chi2$ obtained from $\chi2$ table is 82.3581 for 0.90 confidence. If $n*R2 < \chi2$, heteroscedasticity can not be confirmed. Therefore, no heteroscedasticity problem occurred for all the above calculated amounts of R^2 are less than the critical $\chi2$.

ii. Autocorrelation Problem

Autocorrelation problem occurs when the error term in each period is influenced by each other so that the variance of error term is not in an optimal level. The term autocorrelation may be defined as "correlation between members of series of observations ordered in time [as in time series data] or space [as in cross-sectional data]. The most celebrated test for detecting serial correlation is that developed by statisticians Durbin and Watson. It is popularly known as the Durbin– Watson d statistic.

Table 4.5 Durbin–Watson d Test: Decision Rules

Null hypothesis	Decision	If
No positive autocorrelation	Reject	$0 < d < dL$
No positive autocorrelation	No decision	$dL \leq d \leq dU$
No negative correlation	Reject	$4 - dL < d < 4$
No negative correlation	No decision	$4 - dU \leq d \leq 4 - dL$
No autocorrelation, positive or negative	Do not reject	$dU < d < 4 - dU$

Source: Gujarati, 2004

To see the autocorrelation problem based in the decision rules, significance points of dL and dU at 1% level of significance from Durbin–Watson d statistic table.

Table 4.6 Result on Durbin–Watson d Test: Decision Rules

Null hypothesis	Decision	If
No positive autocorrelation	Reject	$0 < d < 1.335$
No positive autocorrelation	No decision	$1.335 \leq d \leq 1.765$
No negative correlation	Reject	$2.665 < d < 4$
No negative correlation	No decision	$2.235 \leq d \leq 2.665$
No autocorrelation, positive or negative	Do not reject	$1.765 < d < 2.235$

Source: own calculation

According to Table 4.8 model summary Durbin-Watson (d) amount for ROA, ROE and NIM are 1.829, 1.536 and 1.368 respectively. Therefore, the result

exhibited that there is no positive or negative autocorrelation exist in the ROA model which is the main measurement of banking performance in the study. There is also no rejection on the null hypothesis of no autocorrelation for the supportive models ROE and NIM.

iii.   Multicollinearity

According to the assumptions of the classical linear regression model, multicollinearity refers to the situation where there is either an exact or approximately exact linear relationship among the explanatory variables. Since multicollinearity is a question of degree and not of kind, so a problem occurs if the degree of collinearity is high enough to bias the estimates. If there is perfect collinearity, their regression coefficients are indeterminate and their standard errors are not defined. Even if the collinearity is high but not perfect, the estimation of regression coefficients is possible but their standard errors tend to be large. Although there is no one unique method of detecting multicollinearity, or measuring its strength, among several indicators variance inflation factor (VIF) and inspection of partial correlations is used for this particular study (Gujarati, 2004).

When the collinearity of the variable with the other regressors increases, VIF also increases and in the limit it can be infinite. Some authors therefore use the VIF as an indicator of multicollinearity though they are not free of criticism. The larger the value of VIF, the more "troublesome" or collinear in the variable will be. As a rule of thumb, if the VIF of a variable exceeds 10, which will happen if R2 exceeds 0.90, that variable is said be highly collinear.

Table 4.7 variance inflation factor

Variable	VIF	1/VIF
ldr	4.46	0.224327
cir	4.09	0.244589
car	4.06	0.246127
liq	3.69	0.270697
size	3.39	0.295207
sbs	3.16	0.316075
hhi	2.05	0.487749
inf	1.82	0.548311
div	1.80	0.555783
gdp	1.54	0.648247
Mean VIF	3.01	

Therefore, the model is free of multicollinearity problem as VIF is less than 10.

The other testing of multicollinearity is examination of the correlation coefficients that allows studying the null hypothesis of no correlation between explanatory variables. This study considered 0.8 as the limit value of the correlation coefficient to confirm the null hypothesis. So, if correlation between two variables exceeds 0.8, we have to reject the null hypothesis; it's not possible to hold the two variables in the same model. (Gujarati, 2004). As shown in the Correlation Matrix annex, all correlation coefficients are smaller than 0.8 at which the phenomenon of colinearity is pronounced. Then, there is no problem of multicollinearity.

iv. Normality Test

Another third important diagnostic test conducted in this paper is the normality assumption (i.e the normally distributed errors). Since, the histogram is bell-shaped (see appendix 3) and the Shapiro-Wilk W test statistic is not significant. The null hypothesis is that the distribution of the residuals is normal, here the p - value is 0.06 we failed to reject the null (at 95%). We conclude then that residuals are normally distributed in the study, concluded that there is no the problem of normality in the models.

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
r	111	0.84503	13.964	5.882	0.0600

Model Summary

Table 4.8. Model Summary[b]

Model	R	R Square	Adj. R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson
					F Change	df1	df2	Sig. F Change	
1	.846[a]	.715	.687	.991652587	25.122	10	100	.000	1.829
2	.854[a]	.729	.702	8.087674500	26.952	10	100	.000	1.536
3	.450[a]	.203	.123	1.642833740	2.542	10	100	.009	1.368

a) *Predictors: (Constant), Size Bank System, Capital Adequacy, Real GDP Growth, Loan Deposit Ratio, Diversification, Inflation Rate, Cost Income Ratio, Concentration, Liquidity, Bank Size*

b) *Dependent Variable: Model 1- Return on Asset. Model 2- Return on Equity and Model 3- Net Interest Margin*

As Table 4.8 exhibits the model summary, ROE has the highest F-value, 26.952, followed by ROA, 25.122 and NIM, 2.542. The model fit ("ANOVA") has to be seen to check the goodness of fit before looking at R-square first. Significance of the model ("Did the model explain the deviations in the dependent variable") shows the goodness of fit of the model. The lower this number, the better the fit will be. Typically, if "Sig" is greater than 0.05, we conclude that our model could not fit the data. Based on table 4.10 all three models are significant due to the values of sig. are less than 0.05 as 0.000 for ROA and ROE, and 0.009 for NIM which indicates that all models are good models to measure banks profitability because if sig < 0.01, the model is significant at 99%. If the model was not significant (a relationship could not be found) or "R-square is not significantly different from zero."

The explanatory power of the model, the R square, for ROA, ROE and NIM models are 0.715, 0.729 and 0.203 respectively, which means that 71.5% of the variance in ROA and 72.9% of variance in ROE are explained by the given ten independent variables considered in this paper. For NIM model, the independent variables explain only 20.3% of NIM and the remaining 79.7% are unexplained in the model which means there are another additional variables that are important in explaining NIM that have not been considered in this study. Therefore, ROA and ROE models are better reliable than NIM to measure profitability in Ethiopian commercial banks in relation to the ten explanatory variables used in this paper due to the fact that the higher R square the better explained by the independent variables in the model.

4.1.2.3 Regression Results

Table 4.9 Regression on ROA, ROE and NIM Models

Factors	ROA			ROE			NIM		
	Coef.	Std. Err.	P>|t|	Coef.	Std. Err.	P>|t|	Coef.	Std. Err.	P>|t|
size	1.150847	.5016612	0.024**	9.751418	1.061193	0.000***	.5669467	.2760325	0.040**
car	6.030426	2.204647	0.008***	-8.531263	14.309	0.552	6.590998	2.588003	0.011**
cir	-.0109829	.0042388	0.011**	.0194912	.0309364	0.529	-.0061835	.0050703	0.223
Liq	-.0428816	.0174608	0.016**	-.0045314	.131806	0.973	-.0175672	.0213022	0.410
div	.8192006	.1153962	0.000***	2.58318	.5245393	0.000***	-.0392838	.1148574	0.732
ldr	-.018925	.0129713	0.148	.1606946	.0827579	0.052*	-.0180047	.0157065	0.252
hhi	5.801168	2.375026	0.017**	37.68209	14.82393	0.011**	.0652253	2.220522	0.977
sbs	-119.3277	48.90794	0.017**	-98.13226	215.4319	0.649	-73.48826	40.41491	0.069*
inf	.0185065	.010249	0.075*	-.0553429	.0894936	0.536	.0373781	.0126131	0.003***
gdp	3.476329	2.727318	0.206	43.04849	25.69418	0.094*	3.565032	3.477618	0.305
_cons	-8.859793	4.719008	0.064*	-96.64622	22.40418	0.000***	1.246498	3.857836	0.747

Source: Computed using Stata

ROA suggested that all the bank specific variables: the bank size, capital adequacy, cost income ratio, income diversification, and liquidity except loan

to deposit ratio have significant relationship with bank profitability. Among them Size, CIR, and LIQ are significant at 5% and CAR, DIV are significant at 1% level that shows they are the most critical determinants in the ROA model. In the same way, industry specific determinants: concentration and bank size system are both significant at the same level of significant (0.05). However, macroeconomic variables: inflation is significant at 10%. And real GDP growth rate is insignificant in the ROA model.

ROE model revealed that some of the bank specific factors can determine, with different significant level, the profitability of commercial banks in terms of earnings from average equity. Bank size and diversification are significant at 1% level of significance and loan to deposit ratio is significant at 10%. However, capital adequacy, cost income ratio, and liquidity are insignificance at ROE model. Concentration has impact on ROE at 5% and GDP at 10% level of significance, but size bank system from the industry specific factors and Inflation from macroeconomic factors are not significance when we measure bank profitability by ROE.

In the third model, among bank specific determinants, bank size and capital adequacy are significant at 5%. All other bank specific determinants are insignificant. Inflation has impact on NIM with a probability of 1% and bank size system also has effect on the net interest margin of the bank at significant level of 10% However, others such as concentration from industry specific and GDP from macroeconomic factors are insignificant.

4.2 Discussion

According to the descriptive statistics reported in Table 4.1, the Ethiopian commercial banks earn on an average positive profit over the last decade. However, the difference between minimum and maximum clearly shows that

there are large differences in profitability among the Ethiopian commercial banks. That means, the most profitable commercial bank in Ethiopia earned 6.72 cents of net income from a single birr of asset investment and 77.71 cents per birr from the banks equity. In proportion to this the bank has a margin of 10.78 percent. And the maximum losses incurred are a loss of 3.95 and 20.2 cents on each birr of asset investment and on each birr of shareholder equity respectively with the margin of 0.51 percent. On the other hand, the revenue earned throughout the study years is an average of 2.48 cents from each birr invested by the bank and 22.85 cents from their equity with the margin of 4.28 percent.

The discussion and conclusion of the study stick on the result of ROA model whenever there is discrepancy among their results. This is because of that ROA is not distorted by high equity multipliers (ROE disregards the risks associated with leverage), and it reflects a better measure of a bank's ability to generate returns on its assets as well as it considers the disparity in the absolute magnitude of the profits that may be related to size. Since around 80% of the independent variables are unexplained in the NIM model, it should not be taken as a measure model in the discussion. Moreover, based on the reasons stated in the methodology part that fixed model is most common technique in the literature, and more plausible when the entire population are considered, the discussion has to focus on the results of the fixed effect model (ROA model).

Bank size, natural log of total assets, is found to have statistically significant and positive impact on Ethiopian commercial banks' profitability as depicted in the tables 4.9 ROA and NIM are significant at 0.05 and ROE at 0.01significance level respectively. The Hypothesis number 1 that states there is positive significant relationship between bank size and performance of Ethiopian commercial banks is consistent with the result of regression.

The positive coefficient indicates that larger commercial banks tend to earn higher profits than smaller commercial banks, and vice versa. It supports the earlier studies (Sufian and Habibullah, 2009; Kosmidou, 2008; and Kosmidou et al, 2006). This positive association between bank size and profitability of commercial banks may conform that larger banks could be benefited from economies of scale.

The finding of the study also shows that equity to asset ratio (CAR) is positively and highly significant to bank profitability that measured by ROA and NIM as witnessed in the regression results which agree with Hypothesis number 2 that said there is positive significant relationship between capital adequacy and performance of Ethiopian commercial banks. The relationship between capital adequacy and profitability indicates that Ethiopian commercial banks in the study period were focusing on making sound lending decisions which reaffirms that banks with more capital tended to engage in higher loan risk lending for higher profits. On the contrary, the study implies that banks that are relatively poorly capitalized were so conservative in extending loans and thus their profitability would be adversely affected. The empirical finding is consistent with the findings of other researches which are conducted by Berger (1995), Demirguc-Kunt and Huizinga (1999), Staikouras and Wood (2003), Goddard et al. (2004), Pasiouras and Kosmidou (2007), and Kosmidou (2008). These studies point out that those well-capitalized banks face lower risks of going bankrupt, building their credit worthiness, and reducing their cost of funding which will ultimately enhance their profit margin. However, capital adequacy ratio (CAR), in this study, shows insignificant to explain bank profitability which measured by ROE. This shows the effect of the bank capital on profitability is different depending on whether the study considered the profitability of assets or of equity. In the first case, when ROA is considered as the dependent variable, the effect is positive and highly significant, as expected. On the other hand, the negative effect of banks' capital on the ROE is explained when it is taken

as a product of the ROA and equity multiplier (the inverse of the ratio of equity-to-total assets). i.e., ROE = ROA x 1/(Eq/TA). In consequence, the decreases of the ROE resulting from increases in this ratio cannot be interpreted as decreases in the wealth created using the capital invested; rather, they can be seen as a consequence of the decreased level of indebtedness or leverage of the banks.

Expense management or operational efficiency of the bank, measured by cost to income ratio (CIR), is statistically significant in the first model (ROA) and is negatively correlated with profitability that measured by ROA NIM. The negative sign of the CIR variable in the equations of the ROA, and NIM, and its significance coincide with the 3rd Hypothesis which is about the negative relationship between operational efficiency (cost income ratio) and performance of Ethiopian commercial banks. Even though CIR is not significant for the model of NIM, its negative sign has an implication of cost income ratio is inversely proportional to profitability. The result of the study implies that more operationally efficient commercial banks reported higher profits than those commercial banks that have poor expense management over the study period. Therefore, one of the factors that negatively affect the banks' profitability is the failure of management to control cost. The result of the study is consistent with Pasiouras and Kosmidou (2007), and Kosmidou (2008), among others.

As far as liquidity ratio (LIQ) is concerned, it is found to be statistically significant, particularly on ROA model and negatively correlated with profitability measures of all model that coincide Hypothesis number 4. The negative correlation between liquidity and bank profitability reveals that the more liquid a bank is the less profitable it will be. Here one has to interpret the result with caution. Of course, a bank should be liquid enough to meet its depositors' demand of withdrawing money at any time they want to

withdraw. The lower ratio of this reveals that the bank will face difficulty in meeting payments in the right time. A lower ratio of this would also mean that the bank will not effortlessly get funds or else at an extremely high rate of interest which will mount the cost of funding and eventually invade profitability of the bank. On the other hand, if the bank is excessively liquid, it means that the bank is in 'liquidity trap' and is keeping its productive assets idle. This ultimately put the bank's profitability at risk because an extremely higher ratio of this would mean that the bank has kept excess liquid assets inactive and hence losing interest income.

The study also agrees with Hypothesis number 5 that there is a positive significance relationship between income diversification and profitability of banks. The ratio of non-interest income to total income, which measures the level of diversification of a bank's activities, is found to have statistically significant at 1% and positive impact on bank profitability particularly when it is measured by ROA and ROE. A positive and significant association between this variable and profitability reveals that commercial banks in Ethiopia earned a considerable proportion of their income from sources other than interest over the study period. The result of the study suggests that commercial banks in Ethiopia need to diversify their line of business activities to meet their objectives of profit maximization.

Concerning loan to deposit ratio the study result failed to match with Hypothesis number 6 that deals with the significance of loan to deposit ratio on the profitability of the banks, the study finding indicates that there is no statistically correlation between loan to deposit ratio and profitability of the bank.

With regard to the set of exogenous variables, the result suggests a positive relationship between bank concentration and profitability in Ethiopia banking industry (both ROA and ROE are significant at 5%) in line with Hypothesis number 7 (there is a positive significant relationship between concentration and performance of Ethiopian commercial banks). The positive significant correlation of this variable could indicate a high degree of concentration. Banks in highly concentrated markets tend to earn monopoly profits. Thus, the positive sign of concentration may characterize the nature of Ethiopian banking sector may need for more competition and more entry into the banking market.

With regard to the size bank system (SBS) which reflect the importance of bank financing in the economy and it is measured by the ratio of total assets of banks to GDP. The result reveals that the increase of size bank system has negative and significant correlation with profitability as measured in ROA model that agree in significance to Hypothesis number 7 (There is a positive significant relationship between bank size system and performance of Ethiopian commercial banks), but the result disagreed with its negative sign. Therefore, whenever the contribution of Ethiopian commercial banks total asset to GDP is higher, the bank's profitability become lesser as it's negative. The result is supported by different studies (Demirguc-Kunt and Huizinga, 1999).

As far as the macroeconomic factors are concerned, the study result shows that there is no a direct relationship between GDP growth and bank profitability for the variable is found to be statistically insignificant which contradict Hypothesis number 10 which assumes there is a positive relationship between growth of GDP and profitability. However, the positive sign of the variable supports the argument that economic growth positively affects bank profitability mainly through the effect that the economic cycle

exerts on demand for credit by firms. Inflation is also found to be statistically insignificant except for the model of NIM. The result is, therefore, contrary to the expectation (Hypothesis number 9) but it is positively related to bank profitability.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This section provides the conclusion that inferred from the result of empirical exploration of determinants on Ethiopian commercial banks' profitability. It contributes much for interesting parties such as government; regulators, bankers, academician, and stakeholders through enhance their understanding on the factors that positively or negatively affect the performance of commercial banks.

The study was conducted to investigate bank specific, industry specific and macroeconomic explanatory factors of profitability of commercial banks operating in Ethiopia with unbalanced data over the study period (2003-2012). The study used three indicators of profitability as dependent variables: ROA, ROE and NIM, and ten explanatory variables: Size, CAR, CIR, LIQ, DIV and LDR from bank specific, HHI and SBS from industry specific and GDP and INF from macroeconomic factors. After testing through Hausman test, the expected factors were regressed against ROA using fixed effect and ROE and NIM using random effects.

➢ The positive and significant relation between bank size and profitability, as depicted on all measures (ROA, ROE and NIM) indicators that larger banks tend to be earn higher profit than smaller banks, and vice versa. Therefore, in Ethiopian commercial banks context, larger banks could be benefited from economies of scale.

➢ The association between capital adequacy and profitability imply that banks with more capital engage in higher loan risk lending for higher profit. On the contrary banks that are relatively poorly capitalized were so conservative in

extending loans and thus their profitability would be adversely affected. The result of having more capital to asset ratio (and, therefore, better solvency) point out that those well-capitalized banks face lower risks of going bankrupt, building their credit worthiness, and reducing their cost of funding which will ultimately enhance their profit margin.

➢ The negative relationship of cost income ratio and profitability, and its significance on earning on asset shows that more operationally efficient commercial banks reported higher profits than those commercial banks that have poor expense management over the study period. Therefore, one of the factors that negatively affect the banks' profitability is the failure of management to control cost.

➢ The negative and significant correlation between liquidity and bank profitability disclose that the more liquid a bank is the less profitable it will be. Here one has to interpret the result with caution. The lower ratio of liquidity reveals that the bank will face difficulty in meeting payments in the right time and it may force to borrow with extremely high rate of interest and eventually invade profitability of the bank. On the contrary, if the bank is excessively liquid (liquidity trap), it means that the bank is keeping its productive assets idle and hence losing interest income.

➢ A positive and significant relationship of income diversification and profitability shows that commercial banks in Ethiopia earned a considerable proportion of their income from sources other than interest over the study period. The result of the study suggests that commercial banks in Ethiopia need to diversify their line of business activities to meet their objectives of profit maximization.

➢ The positive significant correlation of HHI could indicate a high degree of concentration in Ethiopian banking industry. Banks in highly concentrated markets tend to earn monopoly profits. Thus, the positive sign of concentration may characterize the nature of Ethiopian banking sector may need for more competition and more entry into the banking market. The

negative and significant association between size bank system and profitability exhibits whenever the contribution of Ethiopian commercial banks total asset to GDP is higher, the bank's profitability become lesser.

Even if there is no correlation between GDP and profitability, the positive sign of the variable supports the argument that economic growth positively affects bank profitability mainly through the effect that the economic cycle exerts on demand for credit by firms. Inflation is also found to be statistically insignificant except for the model of NIM.

Generally, the study found that almost all internal factors are the most determinant factors of the profitability of Ethiopian commercial banks. Bank size (Size) which is measured by natural log of total asset, Capital adequacy (CAR) that is calculated as a ratio of bank equity to average asset. Income diversification (DIV) - non-interest incomes to total income which measures income that generated from off-balance sheet are among the internal factors that have positive and significant impact on the profitability of Ethiopian commercial banks. On the other hand, cost income ratio (CIR) - management efficiency- which is measured by non interest cost divided by total of interest income and non-interest income and liquidity risk (liquid asset over total average asset) are among the internal factors that are significant and negatively affect the profitability of the banks.

5.2 Recommendation

Based on the research findings, the following possible recommendations are forwarded to all the concerned bodies.

Overall the empirical results of this study provide evidence that, there is a large difference in profitability among Ethiopian commercial banks. Their profitability is mainly dominated by bank-specific factors which are on the hands of the management of the banks. So, the study suggests to the banks' managers and policy makers to give high concern on the internal factors of profitability and set direction to manage the most determinant factors of performance.

■ Profitability can be realized through enlarging the size of the banks in Ethiopian commercial Banks. Thus, there is a possibility for banks to be benefited from economies of scale through expanding market share in Ethiopian banking industry.

■ The Ethiopian banking capital structure provides promising profit for well capitalized banks; therefore, stake holders are advised to build large capital to asset ratio through, for instance, selling their share for better solvency and reducing fund costs, and ultimately to succeed their objectives of maximizing profits.

■ Efficiency on cost minimizing has a great contribution in profitability of Ethiopian commercial banks. Hence, the study provides suggestion for managers to strive in managing properly the level of non interest expenses like administration expenses. For example, installing ATM in collaboration (like a trend in four banks namely United Bank SC, Awash Bank SC, Nib Bank SC and Bunna Bank SC) may reduce operational costs.

■ Income diversification is the one of income generating area that positively and significantly affects the bank's profitability. Therefore, the paper proposes to the management bodies to expand their non interest earnings, for instance charge on ATM service and diversifying investments.

■ Finally, this study is fully designed to test empirically the impact of bank specific which is mainly based on the balance sheet and financial statement of banks, industry specific and macroeconomic determinants on banks profitability. Therefore, the researcher would like to recommend future researchers to include the impact of non- financial determining factors of banks profitability such as management quality and efficiency.

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Annex

Appendix A

Table 3.1 Variables Description

Variables	Abbreviation	Description	Expected Sign
Return on average assets	ROA	Net Income after Tax / Average Asset	
Return on average equity	ROE	Net Income after Tax / Average Equity	
Net Interest Margin	NIM	Net Interest Income / Total Earning Assets	
Bank Specific:			
Bank Size	Size	Natural Log of Total Asset	+/-
Capital Adequacy	CAR	Average Equity / Average Asset	+
Operational Efficiency	CIR	Non Interest Costs / Interest Income + Non Interest Income	-
Liquidity Risk	LIQ	Liquid Asset / Total Asset	+/-
Income Diversification	DIV	Non-interest Income / Average Assets	+
Loan Deposit Ratio	LDR	Total Loan / Total Deposit	+
Industry Specific			
Bank Concentration	HHI	The sum of the squares of market share of the sample banks (Herfindahl-Hirschman Index)	+
Size Bank System	SBS	Total Assets of All Banks to GDP	+
Macroeconomic Factors			
Real GDP Growth	GDP	GDP of Countries in (%)	+
Inflation Rate	INF	Annual Inflation Rate	-

Appendix B

Correlation Matrix

	roa	roe	nim	size	car	cir	liq	div	ldr	hhi	sbs	inf	gdp
roa	1.0000												
roe	0.7518	1.0000											
nim	0.2249	0.0246	1.0000										
size	0.4886	0.7528	-0.0413	1.0000									
car	-0.5244	-0.6264	0.1128	-0.6419	1.0000								
cir	-0.7198	-0.5941	-0.0165	-0.5701	0.7973	1.0000							
liq	-0.2935	-0.3317	-0.0190	-0.2454	0.4469	0.5015	1.0000						
div	0.5859	0.2472	-0.1887	0.0099	-0.1347	-0.3319	0.0552	1.0000					
ldr	-0.0595	-0.1369	0.1417	-0.4252	0.0330	-0.0585	-0.5427	-0.1464	1.0000				
hhi	-0.1337	0.0044	-0.1112	-0.1857	-0.0891	0.0465	-0.2306	-0.2721	0.3535	1.0000			
sbs	0.2733	0.0875	0.0239	0.2152	0.0374	-0.1516	-0.0430	0.4393	-0.4417	-0.4521	1.0000		
inf	0.0530	-0.0431	0.1884	0.1484	0.0108	-0.0642	-0.1093	0.0628	-0.1678	-0.3434	0.5279	1.0000	
gdp	0.1301	0.1048	0.0744	0.0717	0.0712	0.0124	0.1503	0.1166	-0.1338	-0.4327	0.0400	-0.2240	1.0000

Appendix C

Normality Test