ST.MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF COMMERCIAL BANKS' FINANCIAL PERFORMANCE IN ETHIOPIA.

BY

LEMLEM G/MEDHIN

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ADDIS ABABA, ETHIOPIA

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Declaration

I, LEMLEM G/MEDHIN, HERE BY DECLARE THAT THE THESIS WORK ENTITLED WITH "DETERMINANTS OF COMMERCIAL BANKS' FINANCIAL PERFORMANCE IN ETHIOPIA" SUBMITTED BY ME FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS FOR GENERAL BUSINESS ADMINISTRATION AT ST. MARRY'S UNIVERSITY, IS ORIGINAL WORK AND IT HASN'T BEEN PRESENTED FOR THE AWARD OF ANY OTHER DEGREE, DIPLOMA, FELLOWSHIP OR OTHER SIMILAR TITLES OF ANY OTHER UNIVERSITY OR INSTITUTION.

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This is to certify that the thesis prepared by Lemlem G/medhin G/egziabher, entitled: *Determinants of Commercial Banks financial performance in Ethiopia* and submitted in partial fulfillment of the requirements for the Degree of Masters of Arts in General Business Administration complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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ABSTRACT

This study examines the determinants of financial performance of commercial banks in Ethiopia by using panel data of fifteen sample commercial banks out of eighteen commercial banks operated in Ethiopia over the period 2012-2016. Since the data is secondary in nature, the quantitative approach to research was used. Under this study, both internal and external factors were included. The internal factors used in this study include capital adequacy, Asset quality, Earning ability, liquidity management and Bank size whereas, the external factor is foreign exchange rate. Moreover, ROA and NIM were used to measure the financial performance. Hence based on the result random effect model was adopted. Based on the regression result; asset quality, earning ability and bank size have a significant influence on the financial performance of Ethiopian commercial banks measured by return on asset , return on equity and net interest margin. Thus, management bodies of commercial bank should strive to strengthen the identified significant factors.

ACKNOWLEDGEMENTS

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LIST OF ACRONYMS

AIB - AWASH INTERNATIONAL BANK S.C

AIDB - AGRICULTURAL AND DEVELOPMENT BANK

AQ- ASSET QUALITY

BOA - BANK OF ABYSSINIA S.C

BS- BANK SIZE

CA- CAPITAL ADEQUACY

CBE - COMMERCIAL BANK OF ETHIOPIA

DB - DASHEN BANK S.C

EA- EARNING ABILITY

FEXRA- FOREIGN EXCHANGE RATE

LC - LETTER OF CREDIT

LM- LIQUIDITY MANAGEMENT

NBE - NATIONAL BANK OF ETHIOPIA

NIB - NIB INTERNATIONAL BANK S.C

NIM - NET INTEREST MARGIN

NPL - NON-PERFORMING LOANS

ROA - RETURN ON ASSETS

ROE - RETURN ON EQUITY

UB - UNITED BANK S.C

WB - WEGAGEN BANK S.C

CHAPTER ONE

INTRODUCTION

1.1BACKGROUND OF THE STUDY

Commercial banks play a vital role in the economic resource allocation of countries. They Channel funds from depositors to investors continuously (Dawit f. 2016).As of Dang (2011) banks are not simply involved in financial intermediation activities;rather they are rapidly innovating industry that urges them to create more specializedfinancial services to their customers.

The first bank called Bank of Abyssinia was inaugurated in Feb. 16, 1906 following the agreement that was reached in 1905 between Emperor Minilik II and Mr. Ma Gillivray, representative of the British owned National Bank of Egypt marked the introduction of modern banking in Ethiopia. The Bank was totally managed by the Egyptian National Bank.

Thus by 1931 Bank of Abyssinia was legally replaced by Bank of Ethiopia shortly after Emperor Haile Selassie came to power. The new Bank, Bank of Ethiopia, was a purely Ethiopian institution and was the first indigenous bank in Africa (NBE, 2009/10,) and established by an official decree on August 29, 1931 with capital of £750,000. Bank of Egypt was willing to abandon it's on cessionary rights in return for a payment of Pound Sterling 40,000 and the transfer of ownership took place very smoothly and the offices and personnel of the Bank of Abyssinia including its manager, Mr. Collier, being retained by the new Bank. Ethiopian government owned 60 percent of the total shares of the Bank and all transactions were subject to scrutiny by its Minister of Finance.

Bank of Ethiopia took over the commercial activities of the Bank of Abyssinia and was authorized to issue notes and coins. During the invasion, the Italians established branches of their main banks namely Banco di Italia, Banco di Roma, Banco di Napoli and BancoNazionale del lavoro and started operation in the main towns of Ethiopia. However, they all ceased operation soon after liberation except Banco di Roma and Banco di Napoli

which remained in Asmara. In 1941 another foreign bank, Barclays Bank, came to Ethiopia with the British troops and organized banking services in Addis Ababa, until its withdrawal in 1943. Then on 15th April 1943, the State Bank of Ethiopia commenced full operation after 8 months of preparatory activities. It acted as the central Bank of Ethiopia and had a power to issue bank notes and coins as the agent of the Ministry of Finance. In 1945 and 1949 the Bank was granted the sole right of issuing currency and deal in foreign currency. The Bank also functioned as the principal commercial bank in the country and engaged in all commercial banking activities.

Following the declaration of socialism in 1974 the government extended its control over the whole economy and nationalized all large corporations. Organizational setups were taken in order to create stronger institutions by merging those that perform similar functions. Accordingly, the three private owned banks, Addis Ababa Bank, Banco di Roma and Banco di Napoli Merged in 1976 to form the second largest Bank in Ethiopia called Addis Bank with a capital of Eth. birr 20 million and had a staff of 480 and 34 branches. Before the merger, the foreign participation of these banks was first nationalized in early 1975. Then Addis Bank S.C. and Commercial Bank of Ethiopia were merged by proclamation No.184 of August 2, 1980 to form the sole commercial bank in the country till the establishment of private commercial banks in 1994 (Arnaldo,2003).

Following the fall of the Dergue regime in 1991 that ruled the country for 17 years under the rule of command economy, the EPRDF declared a liberal economy system. In line with this, Monetary and Banking proclamation of 1994 established the National Bank of Ethiopia as a judicial entity, separated from the government and outlined its main function.
Monetary and Banking proclamation No.83/1994 and the Licensing and Supervision of Banking Business No.84/1994 laid down the legal basis for investment in the banking sector. Consequently after the proclamation issued private equity holders began to join the Ethiopian banking industry and as of (January, 2015) seventeen commercial banks are operated and out of this sixteen are private owned.

TABLE 1. LIST OF COMMERCIAL BANKS

NUMBER	NAME OF COMMERCIAL BANKS	YEAR OF ESTABLISHMENT
1	COMMERCIAL BANK OF ETHIOPIA	1963
2	AWASH BANK S.C	1994
3	DASHEN BANK S.C	1995
4	BANK OF ABYSSINYA S.C	1996
5	WEGAGEN BANK S.C	1997
6	UNITED BANK S.C	1998
7	NIB INTERNATIONAL BANK S.C	1999
8	COOPERATIVE BANK OF OROMIA S.C	2005
9	LION INTERNATIONAL BANK S.C	2006
10	OROMIA INTERNATIONAL BANK S.C	2008
11	ZEMEN BANK S.C	2009
12	BUNNA INTERNATIONAL BANK S.C	2009
13	BIREHAN INTERNATIONAL BANK S.C	2010
14	ABAY BANK S.C	2010
15	ADDIS INTERNATIONAL BANK S.C	2011
16	DEBUB GILOBAL BANK S.C	2012
17	ENAT BANK S.C	2013

SOURCE : NBE REPORT 2015/2016

Performance is one of the most important variables in the management research and arguably the most important indicator of the organizational performance. Although the concept of organizational performance is very common in the academic literature, its definition is difficult because of its many meanings. For this reason, there isn't a universally accepted definition of this concept (Corina and et'al,2011).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 macro-economic variables such as, bank size, capital adequacy, expenses management, liquidity risk, income diversification, concentration, bank size system, inflation and economic growth are incorporated (Tesfaye, 2013).

In Ethiopia the commercial banks dominate the financial sector. In a country where the financial sector is dominated by commercial banks, any failure in the sector has a huge implication on the economic growth of the country. This is due to the fact that any bankruptcy that could happen in the sector has a domino effect that can lead to bank runs, crises and bring overall financial crisis and economic problems.Studies show, there are no universally accepted findings on what determines financial performance of the banking sector, because countries vary each other in their economic systems, financial systems, political systems and operating environments. To examine the relationship among measures such as capital adequacy, asset quality, Earnings ability, liquidity management, Bank size and Foreign exchange rate to evaluate their impact on banks financial performance which measured by Return on Asset (ROA),Return on Equity (ROE), and Net Interest Margin (NIM). (Dawitfekadu, 2016).

Identifying the major factors which determine banks financial capacity can help to make necessary decisions. This research examined the internal and external factors that determine the financial performance of Ethiopian commercial banks industry from the period 2012-2016.

1.2 STATEMENT OF THE PROBLEM

Sound financial health of a bank and its financial performance analysis are guarantee to its creditors, managers, shareholders, depositors, employee and the economy at large banks serve as backbone to the economic growth of countries, which facilitate the proper utilization of financial resources by intermediating deficit and surplus unites (Minyahil, 2013). The performance of corporate finance can be determined by company size, change in current assets, and net profit margin (Costea, 2011). In the case of banking industries the major factors are related with the performance of board structure; the factors are organizational structure and board size can determine their performance (Renee, 2005). There exist an impact of Asset size, credit risk, operational efficiency and asset management on economic financial performance of commercial banks(Akhram,2012).

Beyond the intermediation function, the financial performance of banks has critical implications for economic growth of countries. Good financial presentation of Banks rewards the shareholders for their investment. This in turn, gives confidence for additional investment and brings about economic growth. On the other hand, poor bank performance may lead to banking failure and crisis which have negative consequence on the economic growth (Okoth,V&Gemechu,B, 2013).

Nowadays, examining the performance of commercial banks become very crucial for their profitable survival. The survival of commercial Banks in this dynamic economic environment is very dependent upon their good performance that based on scientific investigation. So, its wellbeing and successful operation captures the interest of different researchers and other professionals. Thus, a number of studies have examined the determinants of banks" performance in many countries around the world (Dawit, 2016).

The study conducted on financial performance and ownership structure of Ethiopian commercial banks (Deepak &Abebaw, 2011) indicated that, even if, after 1994 financial liberalization the numbers of banks in the industry (particularly private banks) are increased

and the performance progress of the sector is better than the past. However, Ethiopia financial sector remains closed and is much less developed than its neighbors.

Commercial banks in Ethiopia were faced with increasing competition and rising costs. Therefore these factors increasingly urge the need of more frequent banking examination particularly on their performance (Minyahil, 2013).

As far as the researcher knowledge, there is scanty research that had been done on this area particularly on the specific commercial banks performance and this research paper tried to identify the determining factors by including all the existing commercial banks.

1.3 OBJECTIVES OF THE PAPER

1.3.1 GENERAL OBJECTIVES

The general objective of the research paper was to identify the factors that determine the financial performance of commercial banks in Ethiopia.

1.3.2 SPECIFIC OBJECTIVES

The specific objective for this research for this research were:

- To assess the relationship between the factors and the financial performance of commercial banks.
- To identify the external factors that can determine the financial performance of commercial banks.
- To identify the internal factors that can determine the financial performance of commercial banks.
- To determine which factors has the most influence on the financial performance of commercial banks in Ethiopia.

1.4 RESEARCH QUESTIONS

1. What are the determining factors of commercial banks financial performance?
2. What is the relationship between the determining factors and the financial performance of commercial banks in Ethiopia?
3. What is the effect of the factors on the financial performance of commercial banks?

1.5 SIGNIFICANCE OF THE STUDY

This research paper is significant for filling the gap occurred while conducting the previous findings. The commercial banks can exploit the factors that were not addressed by the commercial banks, and this will help the policy makers of the bank to amend their strategic decision. Other researchers can use it as reference in order to conduct further analysis. Like any other third world nation, the banking industry in Ethiopia is become important source of financing different business segments that operating in the nation. Government can use this paper for identifying which companies operate successfully or failed to take the necessary measures to avoid crises of the bankruptcy in these companies. Investors interested in such studies in order to protect their investment, and directing it to the best investment can be beneficial to use this article.

1.6 SCOPE OF THE STUDY

The paper was conducted on commercial banks of Ethiopia including both the public and private owned commercial banks. The paper will be held within the time period 2016-2017. Using audited financial report of all the commercial banks those have at least five years annual financial report and it was analyzed using descriptive type of research analysis in a quantitative way of analyzing data. All the existing 15 commercial banks in Ethiopia will be taken in to consideration through the process of data collection, those banks who have not a financial report of five years were excluded since the research considered five sequential

fiscal years. The financial performance of commercial banks is indicated by profitability: Return on asset and Net Interest Margin of the banks.

1.7 LIMITATION OF THE STUDY

In conducting the research paper there were problems regarding data collection, some banks do not submit their financial data of specific year so that they were excluded on the sample selection process for not having at least five years data.

1.8 ORGANIZATION OF THE PAPER

This paper will be organized of five chapters which have respective sub sections. The first chapter will be the introduction part which includes the background, problem statement, objective, research question, scope and significance of the study. Chapter two will be the review of related literatures including both the theoretical and empirical literature reviews. Chapter three will be the methodology part of the study which states about the research design, sampling, data source & type, and data analysis technique. The fourth chapter covers the analysis and interpretation of the data collected. The last chapter will be the conclusion and recommendation part of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 THEORETICAL LITERATURE REVIEW

Commercial banks play a significant role in the economic growth of countries. Through their intermediation function banks play a vital role in the efficient allocation of resources of countries by mobilizing resources for productive activities. They transfer funds from those who don't have productive use of it to those with productive venture. In addition to resource allocation good bank performance rewards the shareholders with sufficient return for their investment. When there is return there shall be an investment which, in turn, brings about economic growth. On the other hand, poor banking performance has a negative repercussion on the economic growth and development. Poor performance can lead to runs, failures and crises. Banking crisis could entail financial crisis which in turn brings the economic meltdown as happened in USA in 2007 (Marshall, 2009)

2.1.2 BANK PERFORMANCE INDICATORS

Good Financial performance is the ultimate goal of commercial banks. All the strategies designed and activities performed thereof are meant to realize this grand objective. However, this does not mean that commercial banks have no other goals. Commercial banks could also have additional social and economic goals. However, the intention of this study is related to the first objective, financial performance. Studies made on the financial performance of commercial Banks largely used Return on Asset(ROA), Return on Equity(ROE) and Net Interest Margin (NIM) as a common measure (Murthy &Sree, 2003; Alexandru, 2008; Ezra, 2013).As concluded by extensive Prior academic research there are different accounting based measures for banks" profitability.

2.1.2.2 RETURN ON ASSET (ROA)

ROA is also another major ratio that indicates the profitability of a bank. It is a ratio of Income to its total asset (Khrawish, 2011). It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution (Khrawish, 2011). (Wen, 2010),state that a higher ROA shows that the company is more efficient in using its resources.

2.1.2.3 NET INTEREST MARGIN (NIM)

NIM is a measure of the difference between the interest income generated by banks and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their interest earning assets (Loans and Advances). It is usually expressed as a percentage of what the financial institution earns on loans in a specific time period and other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which it earned income in that time period (the average earning assets). The NIM variable is defined as the net interest income divided by total earnings assets (Loans and Advances) (Gul, Faiza, & Khalid, 2011).

Net interest margin measures the gap between the interest income the bank receives on loans and advances and interest cost of its borrowed funds. 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. Thus, it is one of the key measures of bank profitability. However, a higher net interest margin could reflect riskier lending practices associated with substantial loan loss provisions (Khrawish, 2011).

2.1.3 DETERMINANTS OF BANK PERFORMANCE

The determinants of bank performances can be classified into bank specific (internal) and macroeconomic (external) factors (Al-Tamimi&Hassan , 2010; Aburime U. , 2005). These are stochastic variables that determine the output. Internal factors are individual bank characteristics which affect the banks performance. These factors are basically influenced by internal decisions of management and the board. The external factors are sector-wide or country-wide factors which are beyond the control of the company and affect the profitability of banks.

2.1.3.1 INTERNAL FACTORS

As explained above, the internal factors are bank specific variables which influence the profitability of specific bank. These factors are within the scope of the bank to manipulate them and that they differ from bank to bank. These include Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability, Liquidity and Bank size (Dang &Uyen, 2011). Each of these indicators is further discussed below.

CAPITAL ADEQUACY

Capital is one of the bank specific factors that influence the level of bank profitability. Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation (Athanasoglou, Sophocles, &Matthaios, 2005). Banks capital creates liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs. Moreover, greater bank capital reduces the chance of distress (Dang &Uyen, 2011). However, it is not without drawbacks that it induce weak demand for liability, the cheapest sources of fund Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential loses and protect the bank's debtors. According to (Dang &Uyen, 2011), the adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis.

Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations. It has also a direct effect on the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi&Tabassum, 2010).

Capital adequacy is a reflection of the internal strength of a bank, which would stand it in good stead during the times of crisis. Capital adequacy may have a bearing on the overall performance of a bank, like opening of new branches, fresh lending in high risk but profitable areas, manpower recruitment and diversification of business through subsidiaries or through specially designated branches, as the Commercial banks could think these operational dimensions to the bank"s capital adequacy achievement (Shankar, 1997).The NBE has set specific measure of the capital adequacy position of Banks, which is the ratio the Capital adequacy Ratio (CAR) (NBE Directives No.SBB/9/95). The directive clearly set out the computation mechanism and the conversion factors for both on and off-balance sheet items and strictly set for all banks not to maintain their capital level below 8% of their risk weighted assets.

Capital adequacy is measuring by the ratio of equity capital to total risk weighted assets. It is sometimes mention as capital structured by great deal of literatures. Bank equity capital can be seen in two dimensions as stated by (Brooks, 2008) that is the amount contributed by the owners of a bank (paid-up share capital) that gives them the right to enjoy all the future earnings and the amount of owners" funds available to support a bank"s business which includes reserves, and is also termed as total share holders" funds. Bank"s capital is widely used as one of the determinants of bank profitability since it indicates the financial strength of the bank (Athanasoglou, Sophocles, &Matthaios, 2005).

(Aburime U. T., 2008) Suggested that the bank level of safety will be achieves through the high capital requirement which generate positive net benefit. The degree of security exceeded the level maximizing net benefits. Capital adequacy requirements generally aim to increase the stability of a national banking system by decreasing the likelihood of a bank failure and a number of negative externalities exist in banking that cause risk to systematically under price.

Studies dealing about the capital adequacy are stated and concluded as follows. (Athanasoglou, Sophocles, &Matthaios, 2005)Study on the effects of bank - specific, industry - specific and macroeconomic determinants of profitability on Greek bank from the period 1985 - 2001, based on the empirical framework that incorporates the traditional structure - conduct - performance (SCP) hypothesis. Applying General Movement Method (GMM) used a panel data, the investigation demonstrated that the existence of Positive correlation between returns and capital. Another research conducted by (Flamini, McDonald, & Schumacher, 2009) on the determinants of commercial banks profitability in Sub - Saharan Africa by taking 389 sample banks in 41 SSA countries, they measuring profitability by return on asset indicators. They founded that capital adequacy has positive and significant effect on profitability.

Other researcher (Berger, 1995) found that capital adequacy ratio affected ROA of USA banks positively in 1983-1989 and negatively in 1989-1992. Based on these results, Berger argued that the relationship between capital adequacy ratio and profitability depending on the specific circumstances of the time period observed. According to the results of the study, a high capital adequacy ratio positively affects profitability when financial situation of banks is perceived as risky and it negatively affects profitability in normal situations due to alternative cost of capital. The main problem in benefiting from this result is the difficulty of determining an optimal level for the capital adequacy ratio.

Similar studies conducted on developing countries founded and concluded that; capital adequacy is significant company level determinants of profitability. According to (Naceur&Goaied, 2001) investigation the impact of bank-specific, industry-specific and, macroeconomic determinants of bank's net interest margins and return on asset in the Tunisian banking industry for the 1980-2000 period. The result shows that high net interest margin and return on asset (profitability) tend to be associated with banks that hold a relatively high amount of capital. As determined by (Aburime U. T., 2008) company level determinants of bank profitability evidence from Nigeria. Using a panel data set consist of 91 observations of 33 banks over the 2000 – 2004 period. Regression desired outcomes reveled that capital size is one of significant company level determinants of profitability. Though the

results indicate that capital size is a significant determinant of bank profitability in Nigeria, only the size of the reserves component of bank capital has a significant relationship with bank profitability. But the shares component of bank capital does not have a significant relationship. According to (Belayneh, 2011) on the determinants of commercial banks profitability during the period 2001- 2010 by used Ordinary Least Square (OLS), and balanced panel data of seven Ethiopian commercial banks. The result from estimation shows that capital can significantly affect commercial banks profitability in Ethiopia. Following this he concluded that there is positive relationship between banks capital and profitability. And also the higher the capital level brings higher profitability for Ethiopian commercial banks since by having more capital; a bank can easily adhere to regulatory capital standards and the excess capital also can be provided as loans.

Generally, there is the presence of positive relationship between profitability and capital has been supported by (Athanasoglou, Sophocles, &Matthaios, 2005; Flamini, Valentina ,McDonald, &Liliana, 2009; Naceur&Goaied, 2001; Belayneh, 2011). Therefore, researchers widely suggest that the more capital a bank has, the more resistant it will be to failure.

ASSET QUALITY

The bank's asset is another bank specific variable that affects the profitability of a bank. The bank asset includes among others current asset, credit portfolio, fixed asset, and other investments. Often a growing asset (size) related to the age of the bank (Athanasoglou, Sophocles, &Matthaios, 2005). Loan is the major asset of commercial banks from which they generate income. The quality of loan portfolio determines the profitability of banks. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans (Dang &Uyen, 2011). Thus, nonperforming loan ratios are the best proxies for asset quality. Different types of financial ratios used to study the performances of banks by different scholars. It is the major concern of all commercial banks to keep the amount of nonperforming loans to low level. This is so because high nonperforming loan affects the profitability of the bank. Thus, low nonperforming loans to

total loans shows that the good health of the portfolio a bank. The lower the ratio the better the bank performing (Sangmi&Tabassum, 2010).

The asset quality is measure an ability to manage credit risk for a bank or financial institution. The asset quality reflects the composition and productivity of the assets. Thus, asset quality has a direct impact on the profitability of a bank. As per (Yuqi , 2006), in terms of risk poor asset quality is the major cause for banks poor profitability. It is evaluated by understanding the performance of assets category wise and estimating future performance factoring in the likely distribution of the assets in future. The bank's experience of loan loss, provisions/ write off, loan recovery rate, ability to reduce nonperforming assets and extent of weak assets are analyzed in this regard (Financial Management and Analysis of Projects 2006).

Many empirical evidences stated that asset quality has direct impact on the profitability of banks. The quality of assets particularly, loan assets and investments, would depend largely on the risk management system of the bank. The value of loan assets would depend on the realizable value of the collateral while investment assets would depend on the market value. (Deepak &Abebaw, 2011) Used ratio of Nonperforming assets (loans) to total loans and advances (NPL) as an indicator of bank's asset quality. They stated that the amount of nonperforming assets has a direct implication in the profitability of the bank that is if the proportion of the non performing assets in relation to total loans increase the profitability will be decreased and vice versa.

EARNING ABILITY

The quality of earnings is a very important criterion which represents the quality of bank's profitability and its capability to maintain quality and earn consistently. It primarily determines the profitability of bank and explains its sustainability and growth of future earnings (Khrawish, 2011).

The quality and trend of earnings of a bank depend largely on how well the management manages the assets and liabilities of the bank. A bank must earn reasonable profit to support

asset growth, build up adequate reserves and enhance shareholders" value. Good earnings performance would inspire the confidence of depositors, investors, creditors, and the public at large (Financial Management and Analysis of Projects 2006).

The quality of earnings of a bank determines the ability of the entity to meet debt obligations, the rate of growth of assets, reserves and ultimately the shareholders' value. The quality of earning coupled with the costs impacts the profitability. The quality of earning is also affected by the extent of asset liability mismatch and the resultant volatility in earnings due to changes in the interest rate (Bikker& Hu, 2002). Generally a bank that depends more on leverage will experience more volatile earnings and this also affects the credit creation and liquidity function of the bank (Tobias &Themba , 2011).

LIQUIDITY MANAGEMENT

Liquidity is another factor that determines the level of bank performance. Liquidity refers to the ability of the bank to fulfill its obligations, mainly of depositors. According to (Dang &Uyen, 2011)adequate level of liquidity is positively related with bank profitability. The most common financial ratios that reflect the liquidity position of a bank according to the above author are customer deposit to total asset and total loan to customer deposits. Other scholars use different financial ratio to measure liquidity. For instance (Ilhomovich, 2009) used cash to deposit ratio to measure the liquidity level of banks in Malaysia. However, the study conducted in China and Malaysia found that liquidity level of banks has no relationship with the performances of banks (Said &Mohd, 2011). In the Ethiopian context there seems clear measure of the liquidity: the liquid asset to deposit ratio, which the National Bank of Ethiopia, has set the minimum liquid asset of the Bank not to be less that 15% of the Bank's net current liability. Out of this the directive obliged banks to hold 5% of them in primary reserve assets (NBE Directives No.SBB/9/95).

BANK SIZE

Bank size which is measured by total deposits (Dietrich &Wanzenried, 2009) and Al-Alami (1991) or assets (Smirlock, 1985)is one of the control variable that determines the financial performance of the commercial banks. Studies conducted on determinants of bank profitability took bank size variable, as considered to an important determinants of bank performance (Kosmidou K. , 2008). If the relative size of a firm expands its market power and profits increases, this is the Market-Power (MP) hypothesis. The hypothesis also referred to as the Structure Conduct-Performance (SCP) hypothesis (Athanasoglou, Sophocles, &Matthaios, 2005).

One of the most important questions underlying bank policy is which size optimizes bank profitability, because there is no clear cut point which indicates the relation of appropriate bank size and its profitability? The effect of a growing size on profitability has proved positive to a certain extent. However, for banks that become extremely large, the effect of size could be negative due to bureaucratic and other reasons (Athanasoglou, Sophocles, &Matthaios, 2005).

The different studies regarding bank size concluded mixed empirical results. Some studies found economies of scale for large banks (e.g. (Athanasoglou, Delis, &Staikouras , 2006) South Eastern European banks and (Kosmidou K. , 2008)on Greece banks and others concluded that diseconomies of scale for large banks due to possible bureaucratic bottlenecks and managerial inefficiencies or economics of scale for small banks (e.g. (Athanasoglou, Sophocles, &Matthaios, 2005)on Greece banks, (Aburime U. T., 2008)on Nigeria banks and (Ngo, 2006)Australian bank. As extensive researchers pointed out the expected sign of bank size is ambiguous. Hence, the size-profitability relationship may expect to be non-linear. The researcher uses the natural logarithm of total Assets as a proxy for bank size.

Research conducted by (Belayneh, 2011) on the determinants of commercial banks profitability during the period 2001 - 2010 concluded that the size of all Ethiopian commercial banks which is measured by log of total asset is increased for the last 10 years. In case of Ethiopian commercial banks, as the result implies that larger banks enjoy the

higher profit than smaller banks in Ethiopia banking sector because they are exploiting the benefit of economies of scale.

In the literature, asset and/or deposit base of banks have adopted as proxy for their size. At times, their market shares of assets and/or deposit have also used. The second set of measures, however, follows from the first. According (Aburime U. T., 2008) investigation on Nigerian banking industry on the area of bank performance and supervision by adopted the data envelopment analysis approach founded that; the profitability of the bigger banks is significantly higher than that of the smaller banks.

The impact of a bank's size on its profitability is not uniform. In a study of European banks for the period of 1992 to1998, (Goddard, J., Molyneux, P. and Wilson, S. J., 2004) identified only slight relationship between size and profitability. Some of earlier studies have different results. (Smirlock, 1985), Proves a significant and positive impact of a bank's size on its profitability. (Short, 1979), Goes further by claiming that bank size has a positive influence on profitability through lowering the cost of raising capital for big banks. Later, studies by (Hu &Bikker, 2002) And (Goddard, J., Molyneux, P. and Wilson, S. J., 2004)support the proposition that increasing a bank"s size positively affects profitability through cost of capital. However, there is no consensus in the literature on whether an increase in size provides economies of scale to banks. For example, some researches including (Berger, 1995) claim that there is no significant relationship between profitability and size.

Bank Size is described by the accounting value of banks total assets. Size is an important determinant of profitability. The effect of a bank's size on profitability is not settled in the literature. We expect a positive effect on earnings to be derived from economies of scale and lower perceived probability of default of larger banks. However, increase in size can lead to decreasing profits for banks due to cumbersome bureaucracy. In attempt to track a possible non-linear relationship between banks" profits and size we include size squared into the model. Deposits measured relatively to banks size have a negative impact on bank performance. This is unexpected, since banks normally should strive to attract more deposits as a source of funds.

However, (Badola&Verma , 2006) also found a negative effect of deposits to interest margin in Ukrainian banking.

Total assets are measure of bank size. In the balance sheet, bank assets consist of short and long term in nature. In order to capture possible non-linear relationship between size and profitability, the use of logarithm of total assets as a proxy for bank size is paramount. The rationale behind this thinking is because large banks are more likely to benefit from economies of scale. In this study it is assumed the bigger the bank size the higher the profitability.

2.1.3.2 EXTERNAL FACTOR

Those factors which are beyond the management's control are referred as external or macroeconomic factors and these factors are related to the industry and macroeconomic factors. The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. According to (Deepak &Abebaw, 2011), the external factors, they have a relatively small impact on the profitability of Ethiopian banks. Turning to the external determinants, several factors have been suggested as impacting on financial performance and for this study foreign exchange rate was used.

FOREIGN EXCHANGE RATE

According to Demburg and McDougall (1980) Exchange rate is defined as the domestic price of foreign currency which can be determined either administratively or by the market forces of demand and supply of currencies through imports and exports respectively in the foreign exchange market. The importance of this definition is that it focuses on the concept of price as a nature of exchange rate. The basis for exchange rate determination has been on the premise of purchasing power parity (PPP) concept as enunciated by Cassel (1918). Purchasing power parity (PPP) concept defines exchange rate as the amount of the currency

of one country, which endows the holder with the same amount of purchasing power. Expressed differently, purchasing power parity theory states that the same collection of goods purchased with different currencies should have same cost as measured in any of the currencies (Cooper and Fraser, 1990). The implication of the PPP in the short run is that a nation's currency will tend to depreciate in the foreign exchange market when its rate of inflation exceeds that of other nations and appreciates when its inflation rate is the relatively lower (Cookey,1997).

Foreign Exchange risk arises when a bank holds assets or liabilities in foreign currencies and impacts the earnings and capital of bank due to the fluctuations in the exchange rates. No one can predict what the exchange rate will be in the next period, it can move in either upward or downward direction regardless of what the estimates and predictions were. This uncertain movement poses a threat to the earnings and capital of bank, if such a movement is in undesired and unanticipated direction (Evans, 2014). (Songul, 2013)Turkish banking sector's profitability factors found positive relationship between exchange rate and profitability. Thus this variable has significant and positive impact on profitability. Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

2.2 EMPIRICAL LITERATURE REVIEW

This section gives a brief review of the previous studies made on the determinants of bank performance from both developed and developing nations. Thus, empirical works done on the determinants of bank performance have focused on either a panel of countries (Masood& Ashraf, 2012; Huizinga &Demirguc - Kunt, 1999; Sufian& Shah, 2009; Ezra, 2013; Goddard, J., Molyneux, P. and Wilson, S. J., 2004) or on an individual country (Athanasoglou, Sophocles, &Matthaios, 2005; Kumbirai& Webb, 2010; Tan &Floros, 2012; Yadollahzadeh, Ahmadi, &Soltan, 2013; Dietrich &Wanzenried, 2009; Gul, Faiza, & Khalid,

2011; Sufian& Shah, 2009; Okoth,V&Gemechu,B, 2013; Ghazouani&Moussa, 2013; Alkhatib, 2012).Moreover, most of the studies undertaken on bank performance consider both internal and external factors to examine performance of banks. So, the determinants of bank performance studies conducted in a single country, panel country and studies made in Ethiopia related to bank performance are reviewed as follows.

(Athanasoglou, Sophocles, &Matthaios, 2005) Examine the effect of bank-specific, industry-specific and macroeconomic determinants of bank profitability; using an empirical framework that incorporates the traditional Structure-Conduct-Performance (SCP) hypothesis and they apply a GMM technique to a panel of Greek banks that covers the period 1985-2001. They used independent variables like Capital, credit risk, productivity, expense management, size, ownership, concentration, inflation and business cycle. According to the empirical results, capital is important in explaining bank profitability and that increased exposure to credit risk lowers profits. Additionally, labor productivity growth has a positive and significant impact on profitability, while operating expenses are negatively and strongly linked to it. The estimated effect of size does not provide evidence of economies of scale in banking. Likewise, the ownership status of the banks is insignificant in explaining profitability, denoting that private banks do not in general make relatively higher profits, at least during the period under consideration. Also, the SCP hypothesis is not verified, as the effect of industry concentration on bank profitability was found insignificant.

(Badola&Verma , 2006) Made an attempt to identify the key determinants of profitability of public sector banks in India. The analysis is based on step-wise multivariate regression model used on temporal data from 1991-92 to2003-04. The study has brought out that the explanatory power of some variables is significantly high. Such variables include no interest income (NII), operating expenses (OE), provision and contingencies (P&C) and Spread. However, some variables namely credit/deposit ratio, NPAs and business per employee (BPE) are found with low explanatory power. Hence, the variables non-interest income, operating expenses, provision and contingencies and spread have a significant relationship with net profit. Among them two variables P&C and OE are found having negative relationship. Based on the result they conclude that control over non-performing assets,

operating expenses, provision and contingencies are major areas of concern for the management of public sector banks.

(Kosmidou, Tanna, &Pasiouras, 2006), Investigates the impact of bank-specific characteristics, macroeconomic conditions and financial market structure on UK owned commercial banks" profits measured by return on average assets (ROAA) and net interest margins (NIM). An unbalanced panel data set of 224 observations, covering the period 1995-2002, provided the basis for the econometric analysis. The result of the study shows that capital strength, represented by the equity to assets ratio is the main determinant of UK banks" profits. The other significant determinants are cost-to-income ratio and bank size, both of which impact negatively on bank profits. Besides, the macroeconomic factors namely GDP growth and inflation has a positive impact on bank performance.

The objective of the study made by (Chan&Vong, 2008) was to examine the contribution of bank-specific as well as macroeconomic and financial structure factors to the variation in profitability across banks and over time in Macao by Utilizing bank level data for the period 1993-2007. They adopt the panel data regression to determine the important factors in achieving high profitability by using internal variables such as capital ratio, asset composition, fund source, asset quality, expense management, fee based services, tax and market share including external variables like GDP growth rate, real interest rate and inflation. They use ROA as a profitability measure. Their results reveal that capital strength of a bank positively affects profitability. On the other hand, the asset quality, as measured by the loan loss provisions, affects the performance of banks adversely. In addition, banks with a large retail deposit-taking network do not achieve a level of profitability higher than those with a smaller network. Finally, with regard to macroeconomic variables, only the rate of inflation reveals a significant relationship with banks" performance.

(Dietrich &Wanzenried, 2009)Examined how bank-specific characteristics, macroeconomic variables and Industry-specific factors affect the profitability of 453 commercial banks in Switzerland over the time period from 1999 to 2006.According to (Dietrich &Wanzenried, 2009), this is the first econometric study that has examined the important issue of the determinants of the banking profitability for the Swiss banking market. Besides, this study

incorporates the influence of previously ignored factors such as, the growth of a bank's loans relative to the growth rate of the market, the share of interest income relative to total income, the effective tax rate, bank age or the yearly change of regional population in the regression model. They found that better capitalized bank seem to be more profitable. Also, in case that a bank's loan volume is growing faster than the market, the impact on bank profitability is positive. Looking at the effect of the share of interest income at total income, they found that banks with a higher interest income share are less profitable. Bank age does not have an impact on bank profitability. As to the geographic distribution, banks in the Lake Geneva region, which is the second most important banking area in Switzerland, are slightly more profitable than banks in the Zurich region. Looking at the ownership variables, foreign banks are clearly less profitable than Swiss owned banks. Similarly, privately owned institutions have a slightly higher profitability compared to state-owned banks. GDP growth affects the bank profitability positively, and the effective tax rate and the market concentration rate, which both have a significantly negative impact on bank profitability.

The objective of the study made by (Alexiou&Sofoklis, 2009) was to identify the crucial factors that affected the profitability of the six major Greek commercial banks by using Panel data analysis over the period 2000- 2007 . In this case, ROA and ROE were the dependent variables while bank capital, credit risk, bank size, liquidity risk, operating cost, inflation rate, interest rate, GDP, private consumption and investment were the independent variables. Macroeconomic factors such as inflation and private Consumption appear to play a significant role in shaping the performance of banking institutions. Additionally, bank-specific variables, such as capital or measures of cost-efficiency, also play a critical role in determining bank profitability.

Study made by (Sufian& Shah, 2009), examines the performance of 37 Bangladeshi commercial banks between the year 1997 and 2004 by using an unbalanced bank level panel data. They found that bank specific characteristics, in particular loans intensity, credit risk, and cost have positive and significant impacts on bank performance, while non-interest income shows negative relationship with bank profitability. Regarding bank size results suggest that it is not uniform across the various measures employed. The empirical findings

suggest that size has a negative impact on return on average equity (ROAE), while the opposite is true for return on average assets (ROAA) and net interest margins (NIM). Regarding the impact of macroeconomic indicators, they conclude that the variables have no significant impact on bank profitability, except for inflation which has a negative relationship with Bangladesh banks profitability.

(Kumbirai& Webb, 2010)Made study on the performance of South Africa's commercial banking sector for the period 2005-2009. They employed financial ratios to measure the profitability, liquidity and credit quality performance of five large South African commercial banks. They found that overall bank performance increased considerably in the first two years of the analysis. A significant change in trend is noticed at the beginning of the global financial crisis in 2007, reaching its peak during 2008-2009. This resulted in falling profitability, low liquidity and deteriorating credit quality in the South African Banking sector.

The study made by (Gul, Faiza, & Khalid, 2011)examined the relationship between bank specific and macro-economic characteristics of bank profitability by using data of top fifteen Pakistani commercial banks over the period 2005-2009. They used the pooled Ordinary Least Square (POLS) method to investigate the impact of assets, loans, equity, deposits, economic growth, inflation and market capitalization on major profitability indicators i.e., return on asset (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM) separately. The empirical results have found strong evidence that both internal and external factors have a strong influence on the profitability.

(Sufian F., 2011)Studied bank specific and macroeconomic determinants of profitability by using an unbalanced bank level panel data set of Korean banks for the time period 1992-2003. He found that Korean banks with lower liquidity levels tend to show higher profitability. Furthermore, higher diversification regarding banks income sources towards derivative instruments and other fee based activities shows a positive effect. On the other hand, the impacts of credit risk and overhead costs are negative.

(Alkhatib, 2012)Empirically examine the financial performance of five Palestinian commercial banks listed on Palestine securities exchange (PEX).to assess the financial performance of Palestinian commercial banks, (Alkhatib, 2012)developed 3 models; each consists of one dependent variable and 4 identical independent variables. He used ROA as an internal financial performance indicator the Tobin's Q model (price/book) as a market financial performance indicator and finally the economic value added as an economic financial performance indicator. Bank size, credit risk, operational efficiency and asset management were used as independent variables. The study employed the correlation and multiple regression analysis of annual time series data from 2005-2010.the result of the research reveal that, bank size and asset management were positively related with ROA but credit risk and operational efficiency were negatively correlated with ROA under the first model. Under the second model both bank size and asset management were positively correlated whereas credit risk and operational efficiency is negatively correlated with the market performance of banks measured by Tobin's Q. under the third model that is the model which use economic performance of banks measured by EVA, except operational efficiency, bank size, credit risk and asset management ratio were positively correlated with EVA.

(Lamarana, 2012)Examines the performance of the Malaysians local banks and foreign banks and compares their profitability in the financial sector. This comparative study aims to investigate the factors influencing bank profitability in Malaysia for the period 2005-2011 covering 16 major commercial banks (8 locally owned and 8 foreign owned). He uses ROA and ROE as a dependent variable. On the other hand, capital adequacy, asset quality, management efficiency, liquidity and bank size are the independent variables. The researcher use regression analysis to the panel data. The comparison between the two categories of ownership indicates that foreign banks are more profitable than domestic banks.

(Tan &Floros, 2012) took a sample of 101 banks (five state owned banks,12 joint-stock commercial banks and 84 city commercial banks) to examine the determinants of bank profitability in China for the period of 2003-2009 by using unbalanced bank level panel data. They examine the effects of inflation on bank profitability, while controlling for comprehensive bank-specific and industry-specific variables. They use ROA and NIM as a

dependent variable. The study indicated that there is a positive relationship between bank profitability, cost efficiency, banking sector development, stock market development and inflation in China. The authors report that low profitability can be explained by higher volume of non-traditional activity and higher taxation.

The goal of the study conducted by (Yadollahzadeh, Ahmadi, &Soltan, 2013) was to examine the effective factors on the performance of commercial banks in Iran for nine commercial banks during 2006- 2010 using panel data regression method. They considered Return on asset and return on equity as dependent variables which are separately examined by explanatory variables including bank's size, gearing ratio, nonperforming loans, asset management, operating efficiency and capital adequacy ratio. Their research results show that the variables of bank's size, management efficiency and capital adequacy ratio have a positive effect on the performance of commercial banks while the variables of operating efficiency, gearing ratio and non-performing loans have a negative effect on the performance.

(Weersainghe&Ravinda, 2013)examined the impact of bank specific such as Bank Size, Liquidity Risk, and Operating Cost, Capital adequacy, Credit Risk and macroeconomic determinants like GDP growth rate and Interest Rate on the profitability of commercial banks in Sri Lanka by using quarterly data relating to the bank specific and macroeconomic indicators during the period 2001-2011 and carrying out a multiple panel regression. Moreover, they used ROA and NIM as profitability indicator. According to the empirical results, it was observed that the large banks are recorded more profits due to economic of scale than the banks which are well sound with a higher regulatory capital ratio. Further, the results from the panel regression suggest that the liquidity and operating cost efficiency banks were negatively related to the commercial banks profitability in Sri Lankan. In addition, interest rate found to be having a significant impact on the bank profitability with a negative relationship between the Return on Assets of a bank.

By using linear multiple regression model and Generalized Least Square on panel data, (Okoth,V&Gemechu,B, 2013)studied the determinants of financial performance of

commercial banks in Kenya for ten years from 2001 to 2010. They used independent variables like capital adequacy, asset quality, Management Efficiency, Liquidity Management, GDP Growth Rate, and Inflation Rate and ROA and NIM, as a dependent variable. They found that bank specific factors significantly affect the performance of commercial banks in Kenya, except for liquidity variable. But the overall effect of macroeconomic variables was inconclusive at 5% significance level. The moderating role of ownership identity on the financial performance of commercial banks was insignificant.

The purpose of the study made by (Ghazouani&Moussa, 2013) is to empirically assess the main explanatory factors that might affect the banks performance in Tunisia. They use internal factors namely; size, capital ratio, credit quality, operational efficiency, bank deposit growth and ownership and the External factors include both industry-specific variables such as Concentration and size bank system and macroeconomic variables like GDP Growth and inflation. They use data from the 10 conventional commercial banks on the longest relevant period from 1998 to 2011.They apply a dynamic panel data estimation approach, by employing the generalized method of moments (GMM). The empirical result suggests that the bank capitalization, as well as the best managerial efficiency, have a positive and significant effect on the bank performance. Private owned banks seem to be more profitable than state owned ones. Industry-specific factors, as the concentration and that of the system bank size have a negative and a significant effect on performance. As for the impact of the macroeconomic indicators, they conclude that the overall variables do not have a significant effect on bank performance. However Inflation seems to affect negatively bank"s net interest margin.

The study made by (Berger, 1995) examines the determinants of foreign bank profitability and makes a comparison on performance of foreign banks and domestic banks using the fixed effects method. The sample is an unbalanced panel data set of 51 commercial banks operating in Vietnam from 2000 to 2012. He use ROA and NIM as a dependent variable and ratio of overhead costs, short term customer funding, equity, loans, loan loss provision and other income, to total assets; and total assets to the whole banking total assets, GDP growth rate, the inflation rate, the depth of the financial sector and institutional quality as

explanatory variable. He argues that foreign bank profitability is influenced significantly by all bank specific factors, macro-economic factors and multinational bank indicators. He found that total assets and other income have positive impact on profitability. Moreover, parent bank profitability indicates significant and negative influence on foreign bank profitability. Besides, foreign banks perform better than domestic banks due to their ownership advantage.

Study on the financial performance of the Naara rural bank in the upper east region of Ghana conducted by (Hadad, 2013)used the annual financial statements covering a period of eleven years(2000 to 2010).multiple regression was the major statistical tool used to analyze the data collected from the Naara rural bank. The research is aimed at establishing empirically the relationship that exists between Naara rural banks financial performance on one hand and its credit portfolio, non-performing loan, liquidity and size (total asset) on the other hand. The result of the research reveals that liquidity and size were positively and significantly related to the performance of the bank. Although the effect of its loans portfolio is positive, its influence on performance is statistically insignificant. In addition, non-performing loans were also negative and significantly related to the performance of the bank.

(Huizinga &Demirguc - Kunt, 1999)Using bank level data for 80 countries in the 1988-period, they show that differences in interest margins and bank profitability reflect a variety of determinants: bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators. Controlling for differences in bank activity, leverage, and the macroeconomic environment, they found that a larger bank asset to GDP ratio and a lower market concentration ratio lead to lower margins and profits. Moreover, foreign banks have higher margins and profits compared to domestic banks in developing countries, while the opposite holds in developed countries. Also, there is evidence that the corporate tax burden is fully passed on to bank customers.

(Mohana&Tekeste, 2012) Undertook study to analyze how bank characteristics and the overall financial environment affect the performance of Islamic banks. Utilizing bank level data, the study examines the performance indicators of Islamic banks across eight Middle

Eastern countries between 1993 and 1998. A variety of internal and external banking characteristics were used to predict profitability and efficiency. In general, his analysis of determinants of Islamic banks" profitability confirms previous findings. Controlling for macroeconomic environment, financial market structure, and taxation, the results indicate that high capital-to-asset and loan-to-asset ratios lead to higher profitability. The results also indicate that foreign-owned banks are likely to be profitable. Everything remaining equal, the regression results show that implicit and explicit taxes affect the bank performance and profitability negatively while favorable macroeconomic conditions impact performance measures positively. His results also indicate that stock markets and banks are complementary to each other.

The profitability of European banks during the 1990s is investigated by (Goddard, J., Molyneux, P. and Wilson, S. J., 2004) using cross-sectional, pooled cross-sectional time-series and dynamic panel models. They use cross-sectional and dynamic panel estimation to investigate selected determinants of profitability in six major European banking sectors: Denmark, France, Germany, Italy, Spain and the UK, for the period 1992-98.Models for the determinants of profitability incorporate size, diversification, risk and ownership type, as well as dynamic effects.

Despite intensifying competition there is significant persistence of abnormal profit from year to year. The evidence for any consistent or systematic size-profitability relationship is relatively weak. The relationship between the importance of off-balance-sheet business in a bank"s portfolio and profitability is positive for the UK, but either neutral or negative elsewhere. The relationship between the capital-assets ratio and profitability is positive.

(Sufian& Shah, 2009)Use a sample of 389 banks in 41 SSA countries to study the determinants of bank profitability from 1998 through 2006. Their study is based on an unbalanced panel of SSA commercial banks. They use the return on assets (ROA) as a measure of bank profitability. They use independent variables namely, credit risk, activity mix, capital, bank size, market power, GDP growth and inflation. They found that apart from

credit risk, higher returns on assets are associated with larger bank size, activity diversification, and private ownership. Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion. The results also indicate moderate persistence in profitability. Causation in the Granger sense from returns on assets to capital occurs with a considerable lag, implying that high returns are not immediately retained in the form of equity increases. Thus, the paper gives some support to a policy of imposing higher capital requirements in the region in order to strengthen financial stability.

(Masood& Ashraf, 2012)undertook study on the determinants of Islamic banks profitability in case of different countries by taking 25 banks out of 12 countries for the period of 2005-2010.The objective of their study was to inspect whether bank-specific and macro-economic determinants influence Islamic banks" profitability in the selected countries of different regions by using the balanced panel data regression model. They used ROA and NIM as profitability measure and considered both micro and macro variables as determinants of profitability. The micro determinants include asset size, capital adequacy, asset quality, liquidity, deposits, Assets Management, Operating efficiency, Gearing Ratio, Financial Risk and macro factors included GDP growth and inflation rate. Their study results reveals that, banks with larger assets size and with efficient management lead to greater return on assets and also their result shows that management efficiency regarding operating expenses positively and significantly affects the banks" profitability.

(Ezra, 2013)Undertake study on the determinants of commercial banks profitability in sub-Sahara Africa using an unbalanced panel of 216 commercial banks drawn from 42 countries in SSA for the period 1999 to 2006.He employed the random effect panel methods to estimate bank profitability. Growth in bank asset, growth in bank deposit, capital adequacy, operational efficiency, liquidity ratio, growth in GDP and inflation are an explanatory variable. The findings show that the bank level variables such as capital adequacy and growth in bank deposits have positive influence on bank profitability. According to the study, Positive growth of in these indicators could be results of banking sector liberalization that has been implemented in most of SSA countries since 1980s and 1990s. on the other hand,

growth in bank assets, operational efficiency and bank liquidity indicators have negative effect on bank profitability. The negative effect of these indicators could be explained by disproportionate accumulation of assets through merger and acquisitions of foreign based banks at high costs that has occurred in SSA in the last two decades. On the other hand, negative effect of bank liquidity can be explained by low bank lending. For macro-economic variables, Francis M.E found that both growth in GDP and inflation had a negative effect on bank profitability.

(Belayneh, 2011)Examine the impact of bank-specific, industry specific and macroeconomic determinants of Ethiopian commercial banks profitability that covers the period 2001- 2010 by applying the balanced panel data of seven Ethiopian commercial banks. He used the ROA as a dependent variable and capital, size, loan, deposits, noninterest income, noninterest expense, credit risk, market concentration, economic growth, inflation and saving interest rate as independent variables. The estimation results show that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks profitability in Ethiopia. Market concentration is also a significant determining factor of profitability. Finally, with regard to macroeconomic variables, only economic growth exhibits a significant relationship with banks" profitability.

The study carried out by (Mohana&Tekeste, 2012)was to explore the key determinants of profitability of commercial banks operating in Ethiopia by using unbalanced panel data set of banks over the period 1999/00-2008/09. They used internal factors like capital adequacy, liquidity, credit risk, loan portfolio, asset quality, and expense management and external factors related to the industry and the macroeconomic factors within which the banks operate. Moreover ROA was used as dependent variable. In their analysis the fixed effects model is used to control the unobservable bank specific characteristics. The result of the study reveals that Capital adequacy (equity to asset ratio), diversification (non-interest income to total income) and bank size (log of total assets) are among the internal factors that have positive and significant impact on the profitability of Ethiopian commercial banks. Moreover, the loan loss reserve to total loans is also found to have negative impact on profitability though it is statistically insignificant. In addition to this, liquidity and operational efficiency are among

the internal factors that negatively affect the profitability of the banks. Finally, the macroeconomic factors have insignificant impact on the commercial banks profitability in Ethiopia.

The purpose of the study made by (Habtamu, 2012) is to investigate determinants of private commercial banks profitability in Ethiopia by using panel data of seven private commercial banks from year 2002 to 2011. He used quantitative research approach and secondary financial data are analyzed by using multiple linear regressions models for the three bank profitability measures; Return on Asset (ROA) and Net Interest Margin (NIM). He applied fixed effect regression model to investigate the impact of capital adequacy, asset quality, managerial efficiency, liquidly, bank size, and real GDP growth rate on major bank profitability measures i.e., (ROA) and (NIM) separately. Beside this, he used primary data analysis to solicit mangers perception towards the determinants of private commercial banks profitability. The empirical results shows that bank specific factors; capital adequacy, managerial efficiency, bank size and macro-economic factors; level of GDP, and regulation have a strong influence on the profitability of private commercial banks in Ethiopia.

The main objective of the study made by (Birhanu, 2012) is to examine the effect of bank-specific, industry-specific and macroeconomic determinants of Ethiopian commercial banking industry profitability from the period 2000 - 2011 by using OLS estimation method to measure the effects of internal and external determinants on profitability in terms of average return on asset and net interest margin. The result reveals that, all bank-specific determinants, with the exception of bank size, expense management and credit risk, affect bank profitability significantly and positively in the anticipated way. In addition to this, no evidence is found in support of the presence of market concentration. Finally, from macroeconomic determinants GDP has positive and significant effect on both asset return and interest margin of the bank. But interest rate policy has significant and positive effect only on interest margin.

(Amdemikael, 2012), Carried out study to examine the bank-specific, industry-specific and macro-economic factors affecting bank profitability for eight commercial banks operating in Ethiopia covering the period of 2000-2011. He adopts a mixed research approach by

combining documentary analysis and in-depth interviews. He used ROA as a dependent variable and capital strength, operational efficiency, income diversification, liquidity risk, bank size, asset quality, industry concentration level, real GDP growth and inflation as independent variables. The findings of the study show that capital strength, income diversification, bank size and gross domestic product have statistically significant and positive relationship with banks" profitability. On the other hand, variables like operational efficiency and asset quality have a negative and statistically significant relationship with banks" profitability. However, the relationship for liquidity risk, concentration and inflation is found to be statistically insignificant.

Generally, most of the studies undertaken on bank performance consider both internal and external factors to examine performance of banks. So, the determinants of bank performance studies conducted in a single country, panel country and studies made in Ethiopia related to banks' financial performance and their determining factors. And most of the studies include only the high performing commercial banks in their panel study. The time period in which the researches had covered is before five years and above. This paper will try to cover all commercial banks in Ethiopia and within the recent time period.

2.3CONCEPTUAL FRAMEWORK

Different empirical evidences suggested that the financial performances of commercial banks are determined by internal and external factors. Both Internal and external factors used in this study includes Capital Adequacy, Asset Quality, Earnings Ability, Liquidity Management, Bank size and Foreign exchange rate only for the study proposed. And also the indicators for commercial banks' financial performance were Return on Asset and Net Interest Margin.

FIGURE 1. CONCEPTUAL FRAMEWORK

INDEPENDENT FACTORS   DEPENDENT FACTORS

DETERMINING FACTORS

ꓘ   CAPITAL ADEQUACY
ꓘ   ASSET QUALITY
ꓘ   EARNING ABILITY
ꓘ   LIQUIDITY
    MANAGEMENT
ꓘ   BANK SIZE
ꓘ   FOREIGN EXCHANGE
    RATE

PERFORMANCE INDICATORS

ꓘ   RETURN ON ASSET
ꓘ   NET INTEREST
    MARGIN
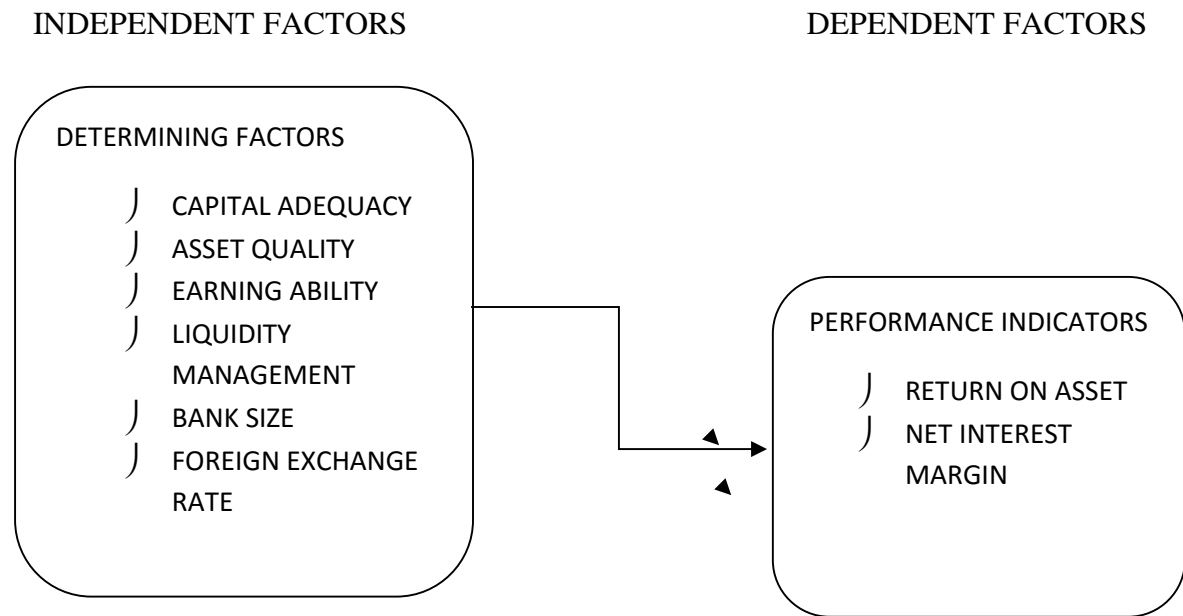
2.4 HYPOTHESES OF THE STUDY

Based on the objective, the study was tested the following hypothesis:

ꓘ Hypothesis 1:   There is positive and significant effect between capital adequacy and financial performance of commercial banks.

ꓘ Hypothesis 2: There is negative and significant effect between asset quality and financial performance of commercial banks

ꓘ Hypothesis 3: There is negative and significant effect between earning ability and financial performance of commercial banks.

ꓘ Hypothesis 4: There is positive and significant effect between liquidity management and financial performance of commercial banks.

ꓘ Hypothesis 5: There is positive and significant effect between Bank size and commercial banks financial performance.

ꓘ Hypothesis 6: There is positive and significant effect between foreign exchange rate and financial Performance of commercial banks.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1RESEARCH DESIGN AND ANALYSIS TOOLS

To attain the stated objectives of the study, which was to investigate the determinants of commercial banks financial performance in Ethiopia, the researcher follows a descriptive research approach. The study was employed using quantitative research approach based on secondary data gathered from the audited financial statements of commercial banks under study and National bank of Ethiopia annual report and different publications" of NBE for Macroeconomic variables. The secondary data analysis was used SPSS software.

3.1.1 POPULATION OF THE STUDY

The detailed Annual balance sheet and income statement information for a universe of Ethiopian commercial banks are used as a main source of data to gather important information for the study. This is a balanced panel for the period from the 2012 to 2016 G.C. Banks that has less than fifteen years of available data is excluded from the sample. These banks are newly-chartered. The Population in this study hence includes 17 commercial banks in Ethiopia (1 under government ownership and 16 private owned commercial banks).

3.1.2 SAMPLE SIZE AND SAMPLING TECHNIQUE

The research was conducted on all existing commercial banks in the banking industry of Ethiopia. It helped the researcher to have better information as the banks have different characteristics and capacity. Their year of establishment also differs and it has its own effect on their performance. The researcher will take commercial banks which have at least five years financial report in Ethiopia.

TABLE 2: LIST OF SAMPLE COMMERCIAL BANKS

NUMBER	NAME OF COMMERCIAL BANKS	YEAR OF ESTABLISHMENT
1	COMMERCIAL BANK OF ETHIOPIA	1963
2	AWASH BANK S.C	1994
3	DASHEN BANK S.C	1995
4	BANK OF ABYSSINYA S.C	1996
5	WEGAGEN BANK S.C	1997
6	UNITED BANK S.C	1998
7	NIB INTERNATIONAL BANK S.C	1999
8	COOPERATIVE BANK OF OROMIA S.C	2005
9	LION INTERNATIONAL BANK S.C	2006
10	OROMIA INTERNATIONAL BANK S.C	2008
11	ZEMEN BANK S.C	2009
12	BUNNA INTERNATIONAL BANK S.C	2009
13	BIREHAN INTERNATIONAL BANK S.C	2010
14	ABAY BANK S.C	2010
15	ADDIS INTERNATIONAL BANK S.C	2011

3.1.3 DATA SOURCE AND DATA COLLECTION TOOLS

This research paper used secondary data source so as to have the necessary data for the financial capacity of the commercial banks. According to (Yuqi , 2006), secondary data have its own advantages. Compared to primary data, secondary data gives higher quality data, the feasibility to conduct longitudinal studies and the permanence of data which means secondary data generally provide a source of data that is both permanent and available in a form that may be checked relatively easily by others. This secondary data

will be gathered through financial reports of the banks, annual reports from national bank and the banks finance department. The previous studies that have been reviewed from literature made on financial performance of commercial banks were focused on different financial variables such like Return on Assets (ROA) and Net Interest Margin (NIM). According to (Jah&Hui, 2012), (Ali,Akhtar, & Ahmed, 2011) the performance indicators are ROA and NIM jointly.

3.1.4 DATA ANALYSIS TECHNIQUE

To achieve the broad research objective, the paper was primarily based on panel data, which was collected through structured document review. Thus, the collected panel data was analyzed using descriptive statistics, correlations and multiple linear regression analysis. Mean values and standard deviations were used to analyze the general trends of the data from 2012 to 2016 based on the sector sample of 15 banks and a correlation matrix was also used to examine the relationship between the dependent variable (Return On Asset & Net Interest Margin), and explanatory variables (Capital adequacy, Asset quality, Earning ability, Liquidity management, Bank size and Foreign exchange rate) . For this study, the regression analysis known as OLS was used to estimate the relationship between profitability and its determinants. The multiple linear regressions model was run, and thus OLS was conducted using STATA econometric software package, to test the casual relationship between the firm's profitability and their potential determinants and to determine the most significant and influential explanatory variables affecting the profitability of Ethiopian banks. Beyond the regression and correlation the researcher used the software to formulate test models for the panel data used.

3.1.5 MODEL SELECTION CRITERIA

The major dependent variables used for performance measurement in this study were Return on Asset (ROA) and Net Interest Margin (NIM) Jointly. The major determinants (independent variables) are capital adequacy, asset quality, Earning Ability and liquidity management was provided by selected ratios. Macro economic variables (GDP growth rate

and average annual Inflation Rate) specifically used as independent variables. The formulation of an economic model is dependent on available information on the study as embedded in standard theories and other major empirical works, or else, the model would be theoretical. In this study the following baseline model of (Olweny&Shipho, 2011) will be used as well:

$$ROA_{it} = \alpha_{it} + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 EA_{it} + \beta_4 LM_{it} + \beta_5 BS_{it} + \beta_6 FEXRA_t + \varepsilon_{it}\ldots\ldots(1)$$

$$NIM_{it} = \alpha_{it} + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 EA_{it} + \beta_4 LM_{it} + \beta_5 BS_{it} + \beta_6 FEXRA_t + \varepsilon_{it}\ldots\ldots(3)$$

Where:-

➤ ROA_{it}= Return on Asset of Bank i at time t
➤ NIM_{it} = Net interest margin of Bank i at time t
➤ α = Intercept
➤ CA_{it}=Capital Adequacy of bank i at time t
➤ AQ_{it}= Asset Quality of bank i at time t
➤ EA_{it}= Earning Ability of Bank i at time t
➤ LM_{it} =Liquidity Management Ratio of Bank i at time t
➤ BS_{it} = Bank Size of Bank i at time t
➤ β_1 - β_6 = Coefficients parameters
➤ $FEXRA_{it}$ = Yearly average Exchange Rate at time t
➤ E_{it}= Error term where i is cross sectional and t time identifier

TABLE **3:**OPERATIONALIZATION OF THE STUDYVARIABLES

	Variable	Notation	Measurement	Used by	Expected
Dependent	Returnon assets	ROA	Net income before tax to its Totalasset	(Chan &Vong, 2008)	
	Net interest margin	NIM	Apercentageofearnsonloans Inatimeperiodandotherassets (InterestIncome)theinterestpaid on borrowed funds (Interest Expense) divided by the average amountearning assets(LoansandAdvances).	(Tan &Floros, 2012)	
	Capital Adequacy	CA	TotalCapitaltoTotalAsset	(Ezra, 2013)	+
	Asset Quality	AQ	Non-performing loans to total loans	(Habtamu, 2012)	_
	Earning Ability	EA	InterestIncometo TotalIncome	(Khrawish, 2011)	_
	Liquidity Management	LM	Theliquidassettotaldeposit	(Hadad, 2013)	+
	Banksize	BS	LogofTotalAssets	(Sufian&Shah, 2009)	+
	Foreign exchange rate	FEXRA	YearlyaverageExchangeRate	(Evans, 2014	+

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and presentation of the results of the study. The data were analyzed by using SPSS software. The descriptive statistics and the correlation analysis were discussed. Followed by the diagnostic test, which is necessary to fulfill the assumption of the classical linear regression model. Then, econometric analysis and discussion of the main finding of the study were presented. Finally, the results of the regression analysis were discussed by supporting empirical evidence.

4.1. DESCRIPTIVE STATISTICS

This section presents the descriptive statistics of dependent and independent variables used in the study for the sample banks. The dependent variables used in the study were ROA and NIM while the independent variables were capital adequacy, asset quality, earning ability, liquidity Management, bank size, and Foreign exchange rate. Thus, the total observation for each dependent and explanatory variables were 75 (panel data of 15 commercial banks for 5 years). The table 3 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample banks over the year 2012 to 2016.

The ROA has a mean value of 3.071 percent. This indicates that the sample banks on average earned 3.071 percent of the total asset. Since ROA indicates the efficiency of the management of a company in generating net income before tax from all the resources of the institutions, the higher ROA shows that the company is more efficient in using its resources. The maximum value of ROA was 5.1 and minimum value of 0 percent. That means the most profitable and least profitable banks among the sampled banks earned 5.1 cents and 0 cents of net income for a single birr invested in the assets of the firm respectively.

The NIM which is measured by the net interest income divided by the total loan and advances has a mean value of 5.334 percent. This implies that, the sample banks on average earned 5.334percent net interest income of the total loan and advances. Since NIM reflects the cost of banks' intermediation services and the efficiency of the bank, the higher the NIM the higher the banks' profit and the more stable the bank is.

Regarding the independent variables, the Capital adequacy which is measured by total equity divided by total assets has a mean value of 14.779 with a maximum and minimum value of 38 and 4.1 percent respectively. In addition, the standard deviation of the Capital adequacy was 5.34 percent. The 2nd independent variable used in the study was Asset quality which is measured by Non-performing loan divided by total loans has a mean value of 11.69 with a Maximum and minimum value of 94 and 19 present respectively and a standard deviation of 11.32. The 3rd independent variable used in the study was earning ability which is measured by Interest income divided by total income has a mean value of 57.02 with a maximum and minimum value of 80 and 0 percent respectively, and a standard deviation of 13.49 percent. The 4th independent variable used in the study was liquidity management which is measured by total equity divided by total deposit has a mean value of 38.86 with a maximum and minimum value of 78.70 and 10.96 percent respectively, and 15.49 percent standard deviation. The 5th internal independent variable used in the study was bank size which was measured by the natural logarithm of total assets has a mean value of 10.64 with a maximum and minimum value of 16.8 and 0 percent respectively. In addition, the standard deviation of the bank size was 2.10 percent. This implies that in the study period the sample commercial banks have a small variation in their total asset.

The external variable used in the study was foreign exchange rate. It has a mean value of 19.76 with a standard deviation of 1.44. This implies that the foreign exchange rate in Ethiopia during the study period remains highly unstable.

TABLE 4: DESCRIPTIVE STATISTICS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	75	.0000	.0510	.030701	.0088642
NIM	75	.0000	.1300	.053740	.0241647
CA	75	.041	.380	.14779	.053413
AQ	75	.019	.940	.11692	.113273
EA	75	.0000	.8000	.570336	.1349141
LM	75	.1096	.7870	.388699	.1549546
BS	75	.00	16.80	10.6483	2.10495
FEXRA	75	17.8192	21.9094	19.761640	1.4427409
Valid N (listwise)	75				

4.2. HETEROSKEDASTICITY TEST

The homoskedasticity is one of the assumptions of the CLRM which states that the variance of the errors must be constant. If the errors do not have a constant variance, they are said to be heteroskedastic (Brooks, 2008). As noted in (Brooks, 2008) Homoskedasticity fails whenever the variance of the unobservable changes across different segments of the population, which are Determined by the different values of the explanatory variables. The ARCH test for heteroskedasticity was used to test the presence of the heteroskedasticity. Accordingly, table 5, 6 and 7 shows that both the F-statistic and chi-square (χ^2) test give the same conclusion that there is no significant evidence for the presence of Heteroskedasticity in ROA and NIM models. Since the p-values in all of the cases were above 0.05, it shows that there is no evidence for the presence of the heteroskedasticity.

Table 5   : Breusch – pagan test for heteroskedesticity for ROA

Source	SS	d.f	MS
Model	0.002480315	6	0.000413386
Residual	0.003334194	68	0.000049032
Total	0.00581451	74	0.000078574

R-squared	= 0.4266	H0: Constant variance
Adj R-squared = 0.3760		F (6, 68) = 8.43
Chi2 (6) =4.99		Prob> chi2 = 0.5448

Table 6 :Breusch – pagan test for heteroskedesticity for NIM

Source	SS	d.f	MS
Model	0.013333515	6	0.002222253
Residual	0.029877485	68	0.000045613
Total	0.0.43211	74	0.000583932

R-squared	= 0.3086	H0: Constant variance	
Adj R-squared	= 0.2476	F (6, 68) = 5.06	
Chi2 (6)	= 7.43	Prob> chi2 = 0.2832	

4.3. MULTICOLLINEARITY TEST

Multicollinearity means the existence of a "perfect" or exact, linear relationship among some or all explanatory variables (Gujarati D., 2004). As noted in (Gujarati D. , 2004) if multicollinearity is perfect, the regression coefficients of the explanatory variables are indeterminate and their standard errors are infinite. If multicollinearity is less than perfect, the regression coefficients, although determinate, possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy. There were different arguments towards the multicollinearity problem. (Gujarati D. , 2004) Stated that multicollinearity problems exist when the correlation coefficient among variables greater than 0.75. (Cooper &Schendlar, 2003), Suggested that a correlation above 0.8 between explanatory variables should be corrected for. Lastly, (Hair JF, 2006) argued that also correlation coefficient below 0.9 may not cause serious multicollinearity problem. In contrary to this, (Kennedy , 2008) argued that as any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results. A correlation matrix used to ensure the correlation. This study adopts the most conservative view of (Kennedy , 2008) among the other and accepts the problem of multicollinearity if the value is exceeds than 0.7.

Table 7: Correlation matrix of dependent and independent variables

VARIABLE	CA	AQ	EA	LM	BS	FEXRA
CA	1.0000					
AQ	0.0849	1.0000				
EA	-0.4939	-0.0644	1.0000			
LM	0.4275	-0.0716	-0.6276	1.0000		
BS	0.2236	0.0570	-0.1448	0.2067	1.0000	
FEXRA	-0.1490	-0.0088	0.2886	-0.4003	0.2136	1.0000

4.4 TEST FOR NORMALITY

According to Brooks (2008), normality assumption of the regression model was tested with the Jarque- Bera measure. It's important that the residuals from the regression models should follow the normal distribution. If the p-value greater than 0.05 the hypothesis of the normal distribution fails to be rejected.

Table 8: Normal test table for ROA

Variables	Observation	Pr(Skewness)	Pr(Kurtosis)	adj Chi^2(2)	Prob>Chi^2
ROA |	75	0.0111	0.0041	12.05	0.0024
CA |	75	0.0002	0.0002	20.72	0.0000
AQ |	75	0.0000	0.0000	.	0.0000
EA |	75	0.0000	0.0008	21.64	0.0000
LM |	75	0.0177	0.8989	5.45	0.0655
BS |	75	0.0002	0.0000	26.84	0.0000
FEXRA |	75	0.5611	0.0000	19.42	0.0001

Source: Stata out-put

The normality tests for this study as shown in figure 4.1 that the coefficient of kurtosis is close to 1 Skewness is close to 1 and the Bera-Jarque figure is not significant and the P-value is 67%, which is greater than 5% implying that the data were consistent with a normal distribution assumption.

Table 9: Normal test table for NIM

Variables	Observation	Pr(Skewness)	Pr(Kurtosis)	adj $Chi^2(2)$	Prob>Chi^2
NIM	75	0.0000	0.0037	19.56	0.0001
CA |	75	0.0002	0.0002	20.72	0.0000
AQ |	75	0.0000	0.0000	.	0.0000
EA |	75	0.0000	0.0008	21.64	0.0000
LM |	75	0.0177	0.8989	5.45	0.0655
BS |	75	0.0002	0.0000	26.84	0.0000
FEXRA |	75	0.5611	0.0000	19.42	0.0001

The normality tests for this study as shown in figure 4.1 that the coefficient of kurtosis is close to 2 Skewness is close to 1 and the Bera-Jarque figure is not significant and the P-value is 65%, which is greater than 5% implying that the data were consistent with a normal distribution assumption.

4.5 MODEL SELECTION CRITERIA

This study used panel data regression. According to Brooks (2008), there are two types of panel data estimator approaches that can be applied for the research model. These are fixed effect and random effect model. Hausman specification test helps to identified whether individual effects are fixed or Random. In this study the specification test providing evidence in favor of the Random effect model as presented in Table p-value is greater than 5% that is significant at 99%, therefore, the random effect model is appropriate.

Table 10: Hausman fixed random test for ROA

Test	Chi-sq statistic	Chi-sqd.f	Probability
Result	15.17	6	0.190

Table 11: Hausman fixed random test for NIM

Test	Chi-sq statistic	Chi-sqd.f	Probability
Result	1.39	6	0.9666

Source: Stata out-put

As shown from the above Hausman specification test Tables 10 and 11, the P-values of ROA and NIM models were 0.190 and 0.9666, which are more than 5% level of significance. Hence, the null hypothesis of the random effect model is appropriate and failed to reject at 5 percent of significant level. This implying that, random effect model and fixed effect model gives more comfort since both variables show that the results of both models are more valid.

4.6 REGRESSION ANALYSIS

Table 12: Regression Result- fixed Effect Model for ROA

Variables	Coefficient	Std.Error	t-statistics	Probability
CA	-0.0450344	0.0225107	-2.00	0.049
AQ	-0.0007317	0.0064873	-0.11	0.911
EM	-0.017716	0.0086941	-1.47	0.146
LM	0.0034998	0.006577	-0.53	0.596
BS	0.0028928	0.0003801	7.61	0.000
FEXRA	0.0023299	0.0153411	-3.34	0.001

R-squared	0.6361
Adj- R-squared	0.6040
Durbin- Watson stat	1.512750

F- Statistics	19.81	
Prob(F-Statistics) =	0.0000	

Source: Stata out –put

The estimation results reported in Table 12 depicted that, The R-squared and Adjusted R-squared values of 0.63 and 0.60 respectively is an indication that the model is a good fit. This means more than 63% of variations in return on asset of Ethiopian commercial banks were explained by independent variables included in the model. However, the remaining 37% changes in return on asset of Ethiopian commercial banks are caused by other factors that are not included in the model. Furthermore, the F-statistic was 19.81 and the probability of not rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable (ROA) and the independent variables, is 0.000000 indicates that the overall model is highly significant at 1% and that all the independent variables are jointly significant in causing variation in return on asset.

➢ Capital Adequacy (CA) and return on asset (ROA)

As the above random effect regression output table 12 presented that, the coefficient of capital adequacy (CA) measured by Total Capital to Total Asset is -0.0450344 and its P-value is 0.049. Holding other independent variables constant at their average value, when capital adequacy (CA) increase by one percent, return on asset (ROA) of sampled Ethiopian commercial banks was decrease by 4% and statistically significant at 1% of significant level. Therefore, the researcher failed to reject the hypothesis that capital adequacy has no positive effect on ROA. This means, there is no sufficient evidence to reject the negative relationship between ROA and CA.

studies shows (Athanasoglou, Sophocles, &Matthaios, 2005; Flamini, Valentina , McDonald, & Liliana, 2009; Naceur&Goaied, 2001); and (Belayneh, 2011). According to those researchers a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems

arising from unexpected losses, thus achieving increased profitability, this finding reflecting the sound financial condition of Ethiopian commercial banks.

The possible reason for the significant negative relationship could be that, increase in capital level brings higher financial performance for Ethiopian commercial banks since by having more capital; a bank can easily adhere to regulatory capital standards so that excess capital can be provided as loans.

> Asset Quality (AQ) and return on asset (ROA)

Table 12 presented the coefficient of Asset Quality (AQ) measured by non-performing loans to total loans is -0.0007317 and its P-value is 0.911. Holding other independent variables constant at their average value, when Asset Quality (AQ) increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks would be decreased by 0.07 percent and statistically significant at 5% level of significant. Therefore, the researcher failed to reject the null hypothesis that asset quality has a negative effect on ROA. This means, there is no sufficient evidence to support the positive relationship between ROA and CA. The relationship is negative as expected and this negative relationship between AQ and ROA could be attributed to the fact that a bank which has high non-performing loans has low finical performance (ROA). This finding is consistent with previous studies with (Bourke, 1989), (Yuqi , 2006), and (Tobias &Themba , 2011). Poor asset quality is major causes of bank failures. High non-performing loan associated with low financial performance (ROA).

The possible reason for the significant negative relationship could be the low collectivity of the disbursed loans with their interest income according to the schedule in Ethiopian commercial banks. This may suggests that Ethiopian commercial banks strictly follow up the timely collection of loan disbursed with interest income.

➢ Earning Ability (EA) and return on asset (ROA)

Table 12 presented that the coefficient of earning Ability (EA) measured by Interest Income to Total Income is -0.0127716 and its P-value are 0.146. Holding other independent variables constant at their average value, when earning Ability (EA) increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks would be decreased by 1% percent and statistically significant at 1% level of significant. Therefore, the researcher failed to reject the null hypothesis that earning Ability has a negative effect on ROA. This means, there is no sufficient evidence to support the positive relationship between ROA and EA.

The relationship is negative as expected and this negative relationship between EA and ROA could be attributed to the fact that a bank more concentrated on interest income source than other income source has low finical performance (ROA). This finding is consistent with previous studies with (Rasiah, 2010), (Sufian F., 2011) and (Belayneh, 2011) which is focused on non-interest income. Focusing only on interest income is associated with low financial performance (ROA).

The possible reason for the significant negative relationship could be given high concentration on interest income than other income source reduces the financial performance (ROA) of Ethiopian commercial banks. This may suggest that Ethiopian commercial banks in addition to their interest income source to work for income diversification.

➢ Liquidity management (LM) and return on asset (ROA)

Table 12 above depicted that, the coefficient of liquidity management (LM) measured by liquid assets to total deposits is -0.0034998 and its P-value is 0.596. Holding other independent variables constant at their average value, when liquidity management (LM) increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks

would be decreased by 0.3%, but statistically insignificant at 5% of significance level. In other words, there is insignificant negative relationship between liquidity management (LM) and return on asset (ROA) of sampled Ethiopian commercial banks. Therefore, the researcher rejects the null hypothesis that there is positive relationship between LM and ROA. This means, there is no sufficient evidence to support the positive relationship between LM and ROA.

In contrary to the hypothesis of this research, LM shows a negative relationship with return on asset (ROA) of sampled Ethiopian commercial banks. The result is consistent with the findings of (Yuqi , 2006) and Guru et al (1999). Liquidity Management of commercial banks included in this study has no significant relationship with return on asset, in contrast,many previous studies for instance (Bourke, 1989), (Yuqi , 2006), and (Tobias &Themba , 2011) stated that liquidity is the major causes of bank failure.

The possible reason for the negative association between LM and ROA could be attributed to the fact that, Ethiopian banking industry holds more liquid assets rather than to disburse it as a loan and earn more interest income.

> Bank Size (BS) and return on asset (ROA)

The above table 12 depicted that, the coefficient of Bank size (BS) measured by Log of Total Assets is 0.0028928 and its P-value is 0.0000. Holding other independent variables constant at their average value, when Bank size (BS) increased by one birr, return on asset of Ethiopian commercial banks would be increased by 0.2% and statistically significant at 1% of significance level. Therefore, the researcher failed to reject the null hypothesis that BS has a positive effect on ROA. This means, there is no sufficient evidence to support the negative relationship between ROA and BS.

The relationship is positive as expected and this positive relationship between BS and ROA could be attributed to the fact that in Ethiopian banking industry the large bank size performs better than the smaller banks due to the existence of economies of scale. The result is consistent with the previous studies of (Gul, Faiza, & Khalid, 2011),

(Athanasoglou, Delis, &Staikouras , 2006), (Sufian& Shah, 2009), (Weersainghe&Ravinda, 2013), (Yadollahzadeh, Ahmadi, &Soltan, 2013), (Sarita, Zandi, &Shahabi, 2012), (Masood & Ashraf, 2012) suggesting that large banks may benefited from economies of scale, in contrast, (Dietrich &Wanzenried, 2009) and (Ezra, 2013) found negative relationship between bank size and performance. They suggested that the smaller the bank, the more efficient the bank will be. Therefore, the finding of this study shows that in Ethiopian banking industry the large bank size perform better than the smaller banks due to the existence of economies of scale. Thus, this study accepted the hypothesis which stated there is a positive relationship between bank size and bank performance in Ethiopia.

The possible reason for the significant positive relationship could be that, large bank size performs better than the smaller banks due to the existence of economies of scale.

➢ Foreign Exchange rate (FEXRA) and return on asset (ROA)

Table 12 above depicted that, the coefficient of foreign exchange rate (FEXRA) is 0.0023299 and its P-value is 0.001. Holding other independent variables constant at their average value, when foreign exchange rate (FEXRA) increased by one birr, return on asset of sampled Ethiopian commercial banks would be increased by 0.2 %, but statistically significant at 1% of significance level. In other words, there is insignificant positive relationship between FEXRA and ROA of Ethiopian commercial banks. Therefore, the researcher rejects the null hypothesis that there is positive relationship between FEXRA and ROA. This means, there is no sufficient evidence to support the positive relationship between ROA and FEXRA.

In contrary to the expectation of this research, FEXRA shows negative relationship with ROA of Ethiopian commercial banks. In relation to previous literature the results for negative coefficients are not similar to the parameters that are observed and revealed by the numbers of researchers (Evans., 2014) and (Songul., 2013).

Table 13: Regression Result- random Effect Model for NIM

Variables	Coefficient	Std.Error	t-statistics	Probability
CA	.0029473	0.0575678	0.51	0.610
AQ	-0.0001972	0.0078471	-0.03	0.980
EM	0.047683	0.0157504	3.03	0.003
LM	-0.0006034	0.0079246	-0.08	0.940
BS	0.0011076	0.0005267	2.10	0.039
FEXRA	0.0032967	0.0290379	-1.91	0.014

R-squared	0.3683
Adj- R-squared	0.3126
Durbin- Watson stat	2.390894
F- Statistics	6.61
Prob(F-Statistics)	0.0000

Source: Stata out –put

The estimation results reported in Table 13 depicted that, The R-squared and Adjusted R-squared values of 0.3683 and 0.3126 respectively is an indication of more than 36% of variations in net interest margin of Ethiopian commercial banks were explained by independent variables included in the model. Furthermore, the F-statistic was 6.61 and the probability of not rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable (NIM) and the independent variables, is 0.000000 indicates that the overall model is highly significant at 1% and that all the independent variables are jointly significant in causing variation in net interest margin.

> Capital Adequacy (CA) and net interest margin (NIM)

As the above random effect regression output table 13 presented that, the coefficient of capital adequacy (CA) measured by Total Capital to Total Asset is 0.029473 and its P-value is 0.610. Holding other independent variables constant at their average value, when capital adequacy (CA) increase by one percent net interest margin (NIM) of sampled Ethiopian commercial banks was increase by 2.9% and statistically significant at 1% of significant level. Therefore, the researcher failed to reject the null hypothesis that capital adequacy has a positive effect on NIM. This means, there is no sufficient evidence to support the negative relationship between NIM and CA.

The relationship is positive as expected and this positive relationship between CA and NIM could be attributed to the fact that a bank with high capital adequacy ratio has high finical performance (NIM). This finding is consistent with previous studies with (Athanasoglou, Sophocles, &Matthaios, 2005; Flamini, Valentina , McDonald, & Liliana, 2009; Naceur&Goaied, 2001); and (Belayneh, 2011). According to those researchers a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability, this finding reflecting the sound financial condition of Ethiopian commercial banks.

The possible reason for the significant positive relationship could be that, increase in capital level brings higher financial performance for Ethiopian commercial banks since by having more capital; a bank can easily adhere to regulatory capital standards so that excess capital can be provided as loans.

> Asset Quality (AQ) and net interest margin (NIM)

Table 13 above depicted that, the coefficient of Asset Quality (AQ) measured by non-performing loans to total loans is -0.0001972 and its P-value is 0.980. Holding other independent variables constant at their average value, when Asset Quality (AQ) increased by 1%, net interest margin (NIM) of sampled Ethiopian commercial banks would be

decreased by 3% but statistically significant at 5% of significance level. Therefore, the researcher failed to reject the null hypothesis that there is negative relationship between Asset Quality and net interest margin. This means, there is no sufficient evidence to support the positive relationship between Asset Quality and net interest margin.

As expected, Asset Quality has a negative relationship with net interest margin in Ethiopian commercial banks. The relationship is negative as expected and this negative relationship between AQ and NIM could be attributed to the fact that a bank which has high non-performing loans has low finical performance (NIM). This finding is consistent with previous studies with (Bourke, 1989), (Yuqi , 2006), and (Tobias &Themba , 2011). Poor asset quality is major causes of bank failures. High non-performing loan associated with low financial performance (NIM).

The possible reason for the insignificant negative relationship could be the collectivity of disbursed loans is very small with their interest income according to the schedule in Ethiopian commercial banks. It indicates that Ethiopian commercial banks have strictly follow-up the timely collection of loan disbursed with interest income.

➢ Earning Ability (EA) and net interest margin (NIM)

Table 13 above depicted that, the coefficient of Earning Ability (EA) measured by Interest Income to Total Income is 0.047683 and its P-value is 0.003. Holding other independent variables constant at their average value, when Earning Ability (EA) increased by one percent, net interest margin (NIM) of sampled Ethiopian commercial banks would be increased by 30%, and statistically insignificant at 1% of significance level. In other words, there is insignificant positive relationship between Earning Ability (EA) and net interest margin (NIM) of sampled Ethiopian commercial banks. Therefore, the researcher rejects the null hypothesis that there is negative relationship between EA and NIM. This means, there is no sufficient evidence to support the negative relationship between EA and NIM.

In contrary to the hypothesis of this research, EA shows a positive relationship with net interest margin (NIM) of sampled Ethiopian commercial banks. The result is consistent with the findings of (Yuqi , 2006) and (Guru et al ,1999).

The possible reason for the positive association between EA and NIM could be attributed to the fact that, Ethiopian commercial banks was more depend on interest income than other sources of incomes.

> Liquidity management (LM) and net interest margin (NIM)

Table 13 above depicted that, the coefficient of Liquidity management (LM) measured by liquid assets to total deposits is 0.0006034 and its P-value is 0.940. Holding other independent variables constant at their average value, when Liquidity management (LM) increased by 1%, net interest margin (NIM) of sampled Ethiopian commercial banks would be decreased by 0.06% but statistically significant at 5% of significance level. Therefore, the researcher failed to reject the null hypothesis that there is negative relationship between Liquidity management and net interest margin. This means, there is no sufficient evidence to support the positive relationship between Liquidity management and net interest margin.

As expected, Liquidity management has a negative relationship with net interest margin in Ethiopian commercial banks. The relationship is negative relationship, LM and NIM could be attributed to the fact that Ethiopian commercial bank hold more liquid asset have the possibility to disburse the cash as a loan to customers and earn more interest income than banks that have less liquid assets. This finding is consistent with previous studies (Bourke, 1989), (Yuqi , 2006), and (Tobias &Themba , 2011) stated that liquidity is the major causes of bank failure.

> ➢ Bank Size (BS) and net interest margin (NIM)

The above table 13 depicted that, the coefficient of Bank size (BS) measured by Log of Total Assets is 0.0011076 and its P-value is 0.039. Holding other independent variables constant at their average value, when Bank size (BS) increased by one birr, net interest margin (NIM) of Ethiopian commercial banks would be increased by 2.1% and statistically significant at 0.1% of significance level. Therefore, the researcher failed to reject the null hypothesis that BS has a positive effect on NIM. This means, there is no sufficient evidence to support the negative relationship between NIM and BS.

The relationship is positive as expected and this positive relationship between BS and NIM could be attributed to the fact that in Ethiopian banking industry the large bank size performs better than the smaller banks due to the existence of economies of scale. The result is consistent with the previous studies of (Gul, Faiza, & Khalid, 2011), (Athanasoglou, Delis, &Staikouras , 2006), (Sufian& Shah, 2009), (Weersainghe&Ravinda, 2013), (Yadollahzadeh, Ahmadi, &Soltan, 2013), (Sarita, Zandi, &Shahabi, 2012) and (Masood & Ashraf, 2012) suggesting that large banks may benefited from economies of scale, in contrast, (Dietrich &Wanzenried, 2009) and (Ezra, 2013) found negative relationship between bank size and performance. They suggested that the smaller the bank, the more efficient the bank will be. Therefore, the finding of this study shows that in Ethiopian banking industry the large bank size perform better than the smaller banks due to the existence of economies of scale. Thus, this study accepted the hypothesis which stated there is a positive relationship between bank size and bank performance measured by NIM in Ethiopia.

> ➢ Foreign Exchange rate (FEXRA) and net interest margin (NIM)

Table 13 above depicted that, the coefficient of Foreign Exchange rate (FEXRA) is 0.0032967 and its P-value is 0.014. Holding other independent variables constant at their average value, when Foreign Exchange rate (FEXRA) increased by 1%, net interest margin (NIM) of sampled Ethiopian commercial banks would be increased by 0.3% but

statistically insignificant at 5% of significance level. Therefore, the researcher failed to reject the null hypothesis that there is positive relationship between Foreign Exchange rate and net interest margin. This means, there is no sufficient evidence to support the negative relationship between Foreign Exchange rate and net interest margin.

As expected, Foreign Exchange rate has a positive relationship with net interest margin in Ethiopian commercial banks. The relationship is positive as expected and this positive relationship between FEXRA and NIM could be attributed to the fact that Ethiopian commercial bank hold more asset in foreign currency have advantage when the exchange rate of the currency increased by selling it for more Ethiopia birr and disbars it as a loan and earn more interest income than banks hold less assets in foreign currency. This finding is consistent with previous studies researchers (Evans., 2014) and (Songul., 2013).

The possible reason for the positive association between FEXRA and NIM could be attributed to the fact that, Ethiopian commercial bank hold more asset in foreign currency, have advantage when the exchange rate of the currency increased by selling it for more Ethiopian birr and disburse it as a loan and earn more interest income than banks hold less assets in foreign currency.

CHAPTER FIVE

SUMMARY, CONCLUSION & RECOMMENDATION

5.1 SUMMARY

The main objective of this study was to examine the determinants of financial performance of commercial banks in Ethiopia. According to previous studies made on the determinants of financial performance, performance is affected by both internal and external factors. Internal factors are factors that are mainly influenced by a bank's management and also called bank specific factors. Those factors include Capital adequacy, asset quality, earning ability, liquidity management and bank size. Furthermore, external factors represent events outside the influence of the banks and also called macroeconomic factor which is foreign exchange rate among others. And two regression models are used for two financial performance measures: (ROA) and (NIM).

Capital adequacy (CA) which is calculated by total capital to total asset have a negative relationship with both ROA and NIM. Asset quality (AQ) measured by non-performing loan to total loans have negative relationship with the financial performance of Ethiopian commercial banks measured by ROA and NIM.

Earning ability (EA) which is the ratio of interest income to total income has a negative relationship with that of the dependent variable ROA. And have a positive impact on NIM.

Bank size (BS) has a significant and positive impact on financial performance of Ethiopian commercial banks measured (ROA and NIM) this shows that in Ethiopia banking industrylarge bank size performs better than the smaller banks due to the existence of economies of scale in contrast banks with less size perform less.

Foreign Exchange rate (FEXRA) has positive and significant relationship with ROA, and positive and significant relationship with NIM. This shows that there was a shortage and excess of asset and liability in foreign currency respectively in the financial reports of commercial

banks in Ethiopian. In the other hand, there was also a shortage of foreign currency as a whole in the financial sector.

5.2 CONCLUSION

Based on the findings, it can be concluded that bank size, have significant impact on ROA with a positive relationship; which means any increase/decrease on the value of these variables leads to an increase/decrease on financial performance of Commercial banks (ROA). And also Asset quality, Capital adequacy ,Earning ability and Foreign exchange rate have significant impact on ROA with a negative relationship; which means any increase/decrease on the value of these variables leads to a decrease/increase on financial performance of Commercial banks (ROA) respectively. In contrast, Liquidity Management has no significant relationship with ROA.

Concerning on the net interest margin, Capital Adequacy, Earning ability and bank size have significant impact on NIM with a positive relationship; which means any increase/decrease on the value of these variables leads to an increase/decrease on financial performance of Commercial banks Measured by NIM respectively. In contrast, asset quality, Liquidity management and foreign exchange rate have no significant relationship with NIM.

Generally, The major determining variables of commercial banks financial performance are internal factors as it was analyzed in the research paper. Liquidity management, earning ability and bank size have major effect on the performance of commercial banks financial capacity. Whereas, asset quality and capital adequacy have a negative impact it was also one of the major determinants that needs more emphasis. The only external factor foreign exchange rate also have its own positive effect however the proportion is less compared to those internal factor.

5.3 RECOMMENDATION

Based on the study finding, the financial performance of Ethiopian commercial banks measured by ROA and NIM were mainly affected by the internal factors; i.e. Capital adequacy, Earning ability and Bank size. Since the management of the bank has control over the bank specific (internal) factors, it is possible to improve the performance of the bank by giving more attention on the identified bank specific factors such as, Capital adequacy, Earning ability and bank size.

Management bodies of Ethiopian commercial banks should strive to strengthen the bank specific factors like capital adequacy, earning ability and bank size. Since, they are found to be the most significant variables that affect financial performances of Ethiopian commercial banks measured by ROA and NIM.

> ➢ They have to Strengthening their capital to make them the best financial performer by selling their share to existing shareholders and new entrants to the banking industry investment.
> ➢ Deposit mobilization is the main issue of the banking sector because the banks with more deposit have the capacity to disburse more loans in order to get more interest income and increasing the capital level by retained it rather than distributing it as a dividend and also the disbursed loans increases the asset of the banks, so they have to work hard on it.
> ➢ It is better to commercial banks to have a diversified income source i.e. collecting more Service charges from foreign transactions like (foreign money transfer, letter of credit and other sources) because, this source of income is more crucial during loan default risk and interest rate fluctuation occur. And also Ethiopian commercial banks can improve their fee based income by introducing innovative products and services to make them best financial performer.
> ➢ And also they have to build their own asset in order to make them best financial performer by acquiring and building more fixed assets.

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APPENDIX

STATA 13.0   Copyright 1985-2013 StataCorp LP

Notes:
    1. (/v# option or -set maxvar-) 5000 maximum variables
. import excel "C:\Users\Administrator\Desktop\ORGANIZED DATA.xlsx", sheet("Sheet1") firstro
>w

. xtset Bank years, yearly
panel variable: Bank (strongly balanced)
time variable: years, 2012 to 2016
delta: 1 year

.
. xtdescribe

   Bank: 1, 2, ..., 15   n =   15
years: 2012, 2013, ..., 2016   T =   5
Delta(years) = 1 year
Span(years) = 5 periods
        (Bank*years uniquely identifies each observation)

Distribution of T_i: min   5%   25%   50%   75%   95%   max
5   5   5   5   5   5   5

   Freq. Percent   Cum. | Pattern
   --------------------------+---------
     15   100.00 100.00 | 11111
   --------------------------+---------
     15   100.00 | XXXXX

. xtreg ROA CA AQ EA LM BS FEXRA, re

Random-effects GLS regression   Number of obs   =   75
Group variable: Bank   Number of groups   =   15

```
R-sq:  within  = 0.5117                    Obs per group: min =      5
between = 0.1939                                   avg =     5.0
overall = 0.4247                                   max =      5

                          Wald chi2(6)    =    54.53
corr(u_i, X)  = 0 (assumed)           Prob> chi2    =    0.0000


-------------------------------------------------------------------------
      ROA |    Coef.  Std. Err.    z   P>|z|    [95% Conf. Interval]
-------------+-----------------------------------------------------------
       CA |  -.0396387  .0197756   -2.00  0.045   -.0783982  -.0008793
       AQ |  -.0042934  .0073298   -0.59  0.558   -.0186595   .0100726
       EA |  -.0103317  .008424    -1.23  0.220   -.0268425   .0061791
       LM |  -.004903   .0073717   -0.67  0.506   -.0193514   .0095453
       BS |  .0028271   .0004187    6.75  0.000    .0020064   .0036478
    FEXRA |  -.0023785  .0006357   -3.74  0.000   -.0036244  -.0011326
    _cons |  .0617592   .0144207    4.28  0.000    .033495    .0900233
-------------+-----------------------------------------------------------
sigma_u|  .00182692
sigma_e|  .00632388
rho |  .07702958   (fraction of variance due to u_i)
-------------------------------------------------------------------------

. reg ROA CA AQ EA LM BS FEXRA,

    Source |     SS     df     MS         Number of obs =     75
-------------+-----------------------------   F( 6,    68) =   8.43
     Model |  .002480315   6  .000413386      Prob> F    = 0.0000
  Residual |  .003334194  68  .000049032      R-squared   = 0.4266
-------------+-----------------------------   Adj R-squared =  0.3760
     Total |  .00581451   74  .000078574      Root MSE    =   .007


-------------------------------------------------------------------------
      ROA |    Coef.  Std. Err.    t   P>|t|    [95% Conf. Interval]
-------------+-----------------------------------------------------------
       CA |  -.0339074  .0180697   -1.88  0.065   -.0699649   .0021502
       AQ |  -.0069414  .0073321   -0.95  0.347   -.0215723   .0076895
       EA |  -.0092446  .0082441   -1.12  0.266   -.0256954   .0072063
       LM |  -.0059754  .0074769   -0.80  0.427   -.0208952   .0089445
       BS |  .0027418   .000425     6.45  0.000    .0018937  .0035898
    FEXRA |  -.0023976  .0006549   -3.66  0.000   -.0037043  -.0010908
    _cons |  .0623043   .0147973    4.21  0.000    .0327766  .0918319
-------------------------------------------------------------------------

. hettest CA AQ EA LM BS FEXRA,
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: CA AQ EA LM BS FEXRA

chi2(6)   =   4.99
Prob>chi2 = 0.5448

. reg ROA CA AQ EA LM BS FEXRA,

```
    Source |    SS      df      MS              Number of obs =     75
-------------+-----------------------------         F( 6,   68) =   8.43
     Model |  .002480315   6  .000413386         Prob> F    = 0.0000
  Residual |  .003334194  68  .000049032         R-squared   = 0.4266
-------------+-----------------------------         Adj R-squared = 0.3760
     Total |   .00581451  74  .000078574         Root MSE    =  .007
```

```
------------------------------------------------------------------------------
      ROA |    Coef.  Std. Err.    t   P>|t|    [95% Conf. Interval]
-------------+----------------------------------------------------------------
      CA |  -.0339074  .0180697  -1.88  0.065   -.0699649   .0021502
      AQ |  -.0069414  .0073321  -0.95  0.347   -.0215723   .0076895
      EA |  -.0092446  .0082441  -1.12  0.266   -.0256954   .0072063
      LM |  -.0059754  .0074769  -0.80  0.427   -.0208952   .0089445
      BS |   .0027418  .000425    6.45  0.000    .0018937   .0035898
   FEXRA |  -.0023976  .0006549  -3.66  0.000   -.0037043  -.0010908
    _cons |   .0623043  .0147973   4.21  0.000    .0327766   .0918319
------------------------------------------------------------------------------
```

. sktest ROA CA AQ EA LM BS FEXRA,

Skewness/Kurtosis tests for Normality
```
                                  ------- joint ------
   Variable |   ObsPr(Skewness)  Pr(Kurtosis) adj chi2(2)   Prob>chi2
-------------+---------------------------------------------------------------
      ROA |   75    0.0111       0.0041      12.05       0.0024
      CA |   75    0.0002       0.0002      20.72       0.0000
      AQ |   75    0.0000       0.0000        .         0.0000
      EA |   75    0.0000       0.0008      21.64       0.0000
      LM |   75    0.0177       0.8989       5.45       0.0655
      BS |   75    0.0002       0.0000      26.84       0.0000
   FEXRA |   75    0.5611       0.0000      19.42       0.0001
```

. prais ROA CA AQ EA LM BS FEXRA,

Number of gaps in sample: 14   (gap count includes panel changes)

(note: computations for rho restarted at each gap)

Iteration 0: rho = 0.0000
Iteration 1: rho = 0.3410
Iteration 2: rho = 0.3914
Iteration 3: rho = 0.4000
Iteration 4: rho = 0.4015
Iteration 5: rho = 0.4018
Iteration 6: rho = 0.4018
Iteration 7: rho = 0.4018
Iteration 8: rho = 0.4018
Iteration 9: rho = 0.4019

Prais-WinstenAR(1) regression -- iterated estimates

```
     Source |    SS      df     MS              Number of obs =      75
------------+------------------------------           F( 6,   68) =   19.81
      Model |  .005090313   6  .000848386         Prob> F     =  0.0000
   Residual |  .002911468  68  .000042816         R-squared   =  0.6361
------------+------------------------------           Adj R-squared =  0.6040
      Total |  .008001781  74  .000108132         Root MSE    =  .00654
```

```
--------------------------------------------------------------------------
       ROA |    Coef.  Std. Err.    t   P>|t|    [95% Conf. Interval]
------------+-------------------------------------------------------------
        CA |  -.0450344  .0225107   -2.00  0.049   -.0899537   -.000115
        AQ |  -.0007317  .0064873   -0.11  0.911   -.0136769   .0122135
        EA |  -.0127716  .0086941   -1.47  0.146   -.0301204   .0045771
        LM |  -.0034998   .006577   -0.53  0.596   -.0166241   .0096244
        BS |   .0028928  .0003801    7.61  0.000    .0021344   .0036513
     FEXRA |  -.0023299  .0006974   -3.34  0.001   -.0037216  -.0009382
      _cons |   .0612435  .0153411    3.99  0.000    .0306307   .0918562
------------+-------------------------------------------------------------
rho |   .4018502
--------------------------------------------------------------------------
```

Durbin-Watson statistic (original)   1.055731
Durbin-Watson statistic (transformed) 1.512750

. correlate ROA CA AQ EA LM BS FEXRA,
(obs=75)

```
           |   ROA     CA     AQ     EA     LM     BS   FEXRA
-----------+-------------------------------------------------------
       ROA |  1.0000
        CA |  0.0167  1.0000
        AQ | -0.0490  0.0849   1.0000
```

```
    EA |  -0.1754  -0.4939  -0.0644   1.0000
    LM |   0.1936   0.4275  -0.0716  -0.6276   1.0000
    BS |   0.5158   0.2236   0.0570  -0.1448   0.2067   1.0000
 FEXRA |  -0.2188  -0.1490  -0.0088   0.2886  -0.4003   0.2136   1.0000
```

. xtreg ROA CA AQ EA LM BS FEXRA, fe

```
Fixed-effects (within) regression          Number of obs     =      75
Group variable: Bank                       Number of groups  =      15

R-sq:  within  = 0.5475                    Obs per group: min =      5
between = 0.1125                                        avg =     5.0
overall = 0.3649                                        max =      5

F(6,54)        =    10.89
corr(u_i, Xb)  = -0.4692                    Prob> F         =   0.0000


-----------------------------------------------------------------------------
      ROA |    Coef.   Std. Err.     t    P>|t|    [95% Conf. Interval]
-------------+---------------------------------------------------------------
       CA |  -.0967689   .0439617   -2.20   0.032   -.1849067   -.008631
       AQ |   .0057871   .0078381    0.74   0.464   -.0099273    .0215014
       EA |  -.0205482   .0116848   -1.76   0.084   -.0439749    .0028785
       LM |   .0004221   .0076219    0.06   0.956    -.014859    .0157032
       BS |   .0032972   .0004442    7.42   0.000    .0024066    .0041878
    FEXRA |  -.0023284   .0006995   -3.33   0.002   -.0037309   -.000926
    _cons |   .0667847   .0165514    4.03   0.000    .0336011    .0999684
-------------+---------------------------------------------------------------
sigma_u|  .00530017
sigma_e|  .00632388
rho |  .41260957   (fraction of variance due to u_i)
-----------------------------------------------------------------------------
F test that all u_i=0:    F(14, 54) =    2.10         Prob> F = 0.0266
```

. estimates store fixed

. xtreg ROA CA AQ EA LM BS FEXRA, re

```
Random-effects GLS regression              Number of obs     =      75
Group variable: Bank                       Number of groups  =      15

R-sq:  within  = 0.5117                    Obs per group: min =      5
between = 0.1939                                        avg =     5.0
overall = 0.4247                                        max =      5
```

```
                    Wald chi2(6)    =    54.53
corr(u_i, X)  = 0 (assumed)          Prob> chi2    =    0.0000


--------------------------------------------------------------------------------
       ROA |    Coef.  Std. Err.    z   P>|z|    [95% Conf. Interval]
-------------+------------------------------------------------------------------
        CA |  -.0396387  .0197756  -2.00  0.045   -.0783982  -.0008793
        AQ |  -.0042934  .0073298  -0.59  0.558   -.0186595   .0100726
        EA |  -.0103317  .008424   -1.23  0.220   -.0268425   .0061791
        LM |  -.004903   .0073717  -0.67  0.506   -.0193514   .0095453
        BS |   .0028271  .0004187   6.75  0.000    .0020064   .0036478
     FEXRA |  -.0023785  .0006357  -3.74  0.000   -.0036244  -.0011326
     _cons |   .0617592  .0144207   4.28  0.000    .033495    .0900233
-------------+------------------------------------------------------------------
sigma_u|  .00182692
sigma_e|  .00632388
rho |  .07702958   (fraction of variance due to u_i)
--------------------------------------------------------------------------------

. estimates store random

. hausman fixed random

        ---- Coefficients ----
        |    (b)       (B)        (b-B)     sqrt(diag(V_b-V_B))
        |   fixed     random    Difference       S.E.
-------------+------------------------------------------------------------------
        CA |  -.0967689  -.0396387    -.0571301      .0392626
        AQ |   .0057871  -.0042934     .0100805      .0027767
        EA |  -.0205482  -.0103317    -.0102165      .0080976
        LM |   .0004221  -.004903      .0053251      .0019369
        BS |   .0032972   .0028271     .0004701      .0001483
     FEXRA |  -.0023284  -.0023785     .0000501      .0002919
--------------------------------------------------------------------------------
            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)
             =     15.17
Prob>chi2 =     0.0190
         (V_b-V_B is not positive definite)

. summarize ROA CA AQ EA LM BS FEXRA,
```

```
     Variable |     Obs     Mean   Std. Dev.    Min     Max
-------------+--------------------------------------------------------
        ROA |      75   .0307013   .0088642      0     .051
         CA |      75   .1477867   .0534128    .041     .38
         AQ |      75    .11692   .1132729    .019     .94
         EA |      75    .570336   .1349141      0      .8
         LM |      75   .3886987   .1549546   .1096    .787
-------------+--------------------------------------------------------
         BS |      75   10.64827   2.104954      0     16.8
      FEXRA |      75   19.76164   1.442741  17.8192  21.9094
```

. xtreg ROE CA AQ EA LM BS FEXRA, re

```
Random-effects GLS regression            Number of obs    =      75
Group variable: Bank                     Number of groups  =      15

R-sq:  within  = 0.5246                   Obs per group: min =      5
between = 0.5197                                      avg =     5.0
overall = 0.5000                                      max =      5

                         Wald chi2(6)     =    70.31
corr(u_i, X)  = 0 (assumed)           Prob> chi2       =   0.0000
```

```
     Source |     SS      df      MS           Number of obs =     75
-------------+------------------------------      F( 6,   68) =  14.09
      Model |  .861241154    6  .143540192       Prob> F      =  0.0000
   Residual |  .692926723   68  .010190099       R-squared    =  0.5541
-------------+------------------------------      Adj R-squared =  0.5148
      Total |  1.55416788   74  .021002269       Root MSE      = .10095
```

```
-----------------------------------------------------------------------------
        ROE |    Coef.   Std. Err.    t   P>|t|    [95% Conf. Interval]
-------------+---------------------------------------------------------------
         CA | -2.212299   .2604952   -8.49  0.000   -2.732109   -1.692489
         AQ |  .0315689   .1056998    0.30  0.766   -.1793518    .2424895
         EA | -.0650672   .1188479   -0.55  0.586   -.3022245    .1720902
         LM |  .0464617   .1077873    0.43  0.668   -.1686246    .261548
         BS |  .0108065   .0061265    1.76  0.082   -.0014188    .0230317
      FEXRA | -.0192923   .0094406   -2.04  0.045   -.0381307    -.000454
      _cons |  .8526097   .2133202    4.00  0.000    .4269359    1.278284
-----------------------------------------------------------------------------
```

. hettest CA AQ EA LM BS FEXRA,

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: CA AQ EA LM BS FEXRA

chi2(6)   =   17.73
Prob>chi2 =   0.0069

. xtreg NIM CA AQ EA LM BS FEXRA, re

Random-effects GLS regression   Number of obs   =   75
Group variable: Bank   Number of groups =   15

R-sq: within = 0.6440   Obs per group: min =   5
between = 0.1592   avg =   5.0
overall = 0.2343   max =   5

                          Wald chi2(6)   =   102.29
corr(u_i, X) = 0 (assumed)   Prob> chi2   =   0.0000

     NIM | Coef. Std. Err.   z   P>|z| [95% Conf. Interval]
---------+---
      CA | -.0403667 .0458615 -0.88 0.379 -.1302535   .0495202
      AQ | -.004479   .0088355 -0.51 0.612 -.0217962   .0128382
      EA | .0431598 .0127919   3.37 0.001   .0180881   .0682315
      LM | -.0014096 .0085977 -0.16 0.870 -.0182607   .0154415
      BS | .0015358 .0004999   3.07 0.002   .0005559 .0025156
   FEXRA | .0030093 .0007734   3.89 0.000   .0014934 .0045252
   _cons | -.0396607 .0190259 -2.08 0.037 -.0769508 -.0023705
---------+---
 sigma_u| .02211685
 sigma_e| .00725297
   rho | .90289891   (fraction of variance due to u_i)

. hettest CA AQ EA LM BS FEXRA,
last estimates not found
r(301);

. reg NIM CA AQ EA LM BS FEXRA,

   Source | SS   df   MS   Number of obs =   75
---------+------------------------------   F(6,   68) =   5.06
   Model | .013333515   6 .002222253   Prob> F   = 0.0002
 Residual | .029877485 68 .000439375   R-squared   = 0.3086
---------+------------------------------   Adj R-squared = 0.2476

```
    Total |   .043211   74  .000583932           Root MSE   = .02096
```

```
----------------------------------------------------------------------------
      NIM |    Coef.   Std. Err.    t    P>|t|    [95% Conf. Interval]
----------+-----------------------------------------------------------------
       CA |  .0343547   .0540914    0.64   0.527   -.0735829   .1422924
       AQ |  -.0200953  .0219484   -0.92   0.363   -.0638926   .023702
       EA |  .0976701   .0246786    3.96   0.000    .0484248   .1469155
       LM |  .0122217   .0223819    0.55   0.587   -.0324406   .056884
       BS |  .0000134   .0012722    0.01   0.992   -.0025251   .002552
    FEXRA |  .0029999   .0019603    1.53   0.131   -.0009118   .0069117
    _cons |  -.0688693  .0442956   -1.55   0.125   -.1572597   .0195211
----------------------------------------------------------------------------
```

. hettest CA AQ EA LM BS FEXRA,

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
       Ho: Constant variance
       Variables: CA AQ EA LM BS FEXRA

chi2(6)   =   7.43
Prob>chi2 = 0.2832

. sktest NIM CA AQ EA LM BS FEXRA,

Skewness/Kurtosis tests for Normality
                                 ------- joint ------
   Variable | Obs Pr(Skewness) Pr(Kurtosis) adj chi2(2)   Prob>chi2
------------+---
      NIM | 75   0.0000   0.0037   19.56   0.0001
       CA | 75   0.0002   0.0002   20.72   0.0000
       AQ | 75   0.0000   0.0000   .   0.0000
       EA | 75   0.0000   0.0008   21.64   0.0000
       LM | 75   0.0177   0.8989   5.45   0.0655
       BS | 75   0.0002   0.0000   26.84   0.0000
    FEXRA | 75   0.5611   0.0000   19.42   0.0001

. prais NIM CA AQ EA LM BS FEXRA,

Number of gaps in sample: 14   (gap count includes panel changes)
(note: computations for rho restarted at each gap)

Iteration 0: rho = 0.0000
Iteration 1: rho = 0.8874
Iteration 2: rho = 0.9212
Iteration 3: rho = 0.9205

Iteration 4: rho = 0.9205
Iteration 5: rho = 0.9205

Prais-WinstenAR(1) regression -- iterated estimates

```
    Source |     SS      df      MS              Number of obs =    75
-------------+------------------------------         F( 6,   68) =   6.61
     Model | .003667128    6 .000611188        Prob> F    = 0.0000
  Residual | .006289754   68 .000092496        R-squared   = 0.3683
-------------+------------------------------         Adj R-squared = 0.3126
     Total | .009956882   74 .000134552        Root MSE    = .00962
```

```
--------------------------------------------------------------------------------
       NIM |    Coef.  Std. Err.    t   P>|t|    [95% Conf. Interval]
-------------+----------------------------------------------------------
      CA |   .029473  .0575678    0.51  0.610   -.0854017   .1443477
      AQ | -.0001972  .0078471   -0.03  0.980   -.0158558   .0154613
      EA |   .047683  .0157504    3.03  0.003    .0162536   .0791124
      LM | -.0006034  .0079246   -0.08  0.940   -.0164167     .01521
      BS |  .0011076  .0005267    2.10  0.039    .0000565   .0021586
    FEXRA |  .0032967  .0013112    2.51  0.014    .0006802   .0059132
     _cons | -.0555887  .0290379   -1.91  0.060   -.1135328   .0023555
-------------+----------------------------------------------------------
rho |   .9205485
--------------------------------------------------------------------------------
```

Durbin-Watson statistic (original)   0.260331
Durbin-Watson statistic (transformed) 2.390894

. correlate NIM CA AQ EA LM BS FEXRA,
(obs=75)

```
         |   NIM    CA    AQ    EA    LM    BS   FEXRA
-------------+----------------------------------------------------------
     NIM |  1.0000
      CA | -0.1943  1.0000
      AQ | -0.1300  0.0849  1.0000
      EA |  0.5162 -0.4939 -0.0644  1.0000
      LM | -0.2961  0.4275 -0.0716 -0.6276  1.0000
      BS | -0.0117  0.2236  0.0570 -0.1448  0.2067  1.0000
    FEXRA |  0.2949 -0.1490 -0.0088  0.2886 -0.4003  0.2136  1.0000
```

. summarize NIM CA AQ EA LM BS FEXRA,

```
  Variable |   Obs    Mean  Std. Dev.   Min    Max
-------------+--------------------------------------------------------
```

```
        NIM |     75    .05374   .0241647      0      .13
         CA |     75  .1477867   .0534128    .041     .38
         AQ |     75   .11692   .1132729    .019     .94
         EA |     75  .570336   .1349141      0      .8
         LM |     75  .3886987  .1549546   .1096    .787
-------------+---------------------------------------------------------
         BS |     75  10.64827  2.104954      0     16.8
      FEXRA |     75  19.76164  1.442741  17.8192  21.9094
```

. xtreg NIM CA AQ EA LM BS FEXRA, fe

```
Fixed-effects (within) regression          Number of obs    =      75
Group variable: Bank                       Number of groups  =      15

R-sq:  within = 0.6445                     Obs per group: min =       5
between = 0.1457                                        avg =     5.0
overall = 0.2235                                        max =       5

F(6,54)        =    16.32
corr(u_i, Xb) = 0.0843              Prob> F        =   0.0000

------------------------------------------------------------------------------
      NIM |    Coef.  Std. Err.    t   P>|t|    [95% Conf. Interval]
-------------+----------------------------------------------------------------
       CA |  -.042224  .0504204  -0.84  0.406  -.1433108   .0588627
       AQ |  -.0038448 .0089896  -0.43  0.671  -.0218679   .0141783
       EA |  .0396361  .0134015   2.96  0.005   .0127676   .0665046
       LM |  -.0014405 .0087417  -0.16  0.870  -.0189666   .0160857
       BS |  .0016188  .0005095   3.18  0.002   .0005973   .0026403
    FEXRA |  .0030674  .0008023   3.82  0.000   .0014589   .0046759
     _cons | -.0394708 .0189831  -2.08  0.042  -.0775296  -.0014119
-------------+----------------------------------------------------------------
sigma_u| .02102122
sigma_e| .00725297
rho  | .89361812   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:   F(14, 54) =   36.71        Prob> F = 0.0000
```

. estimates store fixed

. xtreg NIM CA AQ EA LM BS FEXRA, re

```
Random-effects GLS regression            Number of obs    =      75
Group variable: Bank                     Number of groups  =      15

R-sq:  within = 0.6440                    Obs per group: min =       5
```

```
between = 0.1592                                    avg =      5.0
overall = 0.2343                                    max =      5

                         Wald chi2(6)       =   102.29
corr(u_i, X)  = 0 (assumed)              Prob> chi2     =    0.0000


-------------------------------------------------------------------------------
     NIM |    Coef.  Std. Err.    z   P>|z|    [95% Conf. Interval]
-------------+-----------------------------------------------------------------
      CA |  -.0403667  .0458615   -0.88  0.379   -.1302535   .0495202
      AQ |   -.004479  .0088355   -0.51  0.612   -.0217962   .0128382
      EA |   .0431598  .0127919    3.37  0.001    .0180881   .0682315
      LM |  -.0014096  .0085977   -0.16  0.870   -.0182607   .0154415
      BS |   .0015358  .0004999    3.07  0.002    .0005559   .0025156
   FEXRA |   .0030093  .0007734    3.89  0.000    .0014934   .0045252
   _cons |  -.0396607  .0190259   -2.08  0.037   -.0769508  -.0023705
-------------+-----------------------------------------------------------------
sigma_u|  .02211685
sigma_e|  .00725297
rho |  .90289891   (fraction of variance due to u_i)
-------------------------------------------------------------------------------

. estimates store random

. hausman fixed random


         ---- Coefficients ----
     |     (b)       (B)          (b-B)    sqrt(diag(V_b-V_B))
     |    fixed      random     Difference       S.E.
-------------+-----------------------------------------------------------------
      CA |   -.042224   -.0403667     -.0018574       .0209509
      AQ |  -.0038448    -.004479      .0006342       .0016575
      EA |   .0396361    .0431598     -.0035237        .003996
      LM |  -.0014405   -.0014096     -.0000309       .0015805
      BS |   .0016188    .0015358       .000083       .0000983
   FEXRA |   .0030674    .0030093      .0000581       .0002132
-------------------------------------------------------------------------------
              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)
             =       1.39
Prob>chi2 =     0.9666
```

Year	ROA	ROE	NIM	CA	AQ	EA	LM	BS	FEXRA	BANK
2012	0.0398	0.7771	0.0368	0.048	0.11	0.5792	0.2153	8.48	17.8192	CBE
2013	0.0343	0.7283	0.0413	0.045	0.1	0.6831	0.233	7.85	18.7358	CBE
2014	0.0306	0.6765	0.0395	0.044	0.12	0.6977	0.1621	7.86	19.675	CBE
2015	0.0324	0.727	0.0663	0.043	0.088	0.73	0.787	10.72	20.6688	CBE
2016	0.0276	0.6412	0.0647	0.041	0.16	0.76	0.1096	10.33	21.9094	CBE
2012	0.036	0.27	0.04	0.13	0.1	0.602	0.343	10.1	17.8192	AIB
2013	0.038	0.28	0.044	0.135	0.09	0.598	0.285	11.1	18.7358	AIB
2014	0.035	0.272	0.04	0.12	0.13	0.567	0.336	11	19.675	AIB
2015	0.029	0.23	0.043	0.129	0.11	0.635	0.21	10.5	20.6688	AIB
2016	0.028	0.215	0.05	0.128	0.13	0.681	0.254	10.6	21.9094	AIB
2012	0.0405	0.4044	0.0369	0.1	0.08	0.5203	0.4105	10.72	17.8192	DB
2013	0.0326	0.3133	0.0351	0.1	0.1	0.5618	0.3824	9.75	18.7358	DB
2014	0.0342	0.3069	0.0358	0.118	0.13	0.5319	0.37	10.29	19.675	DB
2015	0.0312	0.2641	0.0395	0.118	0.11	0.5623	0.2791	10.77	20.6688	DB
2016	0.0273	0.2351	0.0372	0.117	0.15	0.5567	0.3019	10.25	21.9094	DB
2012	0.028	0.276	0.047	0.11	0.09	0.688	0.373	9.3	17.8192	BOA
2013	0.024	0.215	0.038	0.11	0.23	0.688	0.232	7.9	18.7358	BOA
2014	0.042	0.339	0.05	0.13	0.019	0.62	0.302	11.1	19.675	BOA
2015	0.023	0.175	0.049	0.13	0.1	0.707	0.564	9.7	20.6688	BOA
2016	0.024	0.183	0.053	0.12	0.11	0.672	0.228	10.7	21.9094	BOA
2012	0.041	0.229	0.048	0.19	0.046	0.52	0.485	10.4	17.8192	WBE
2013	0.037	0.2	0.051	0.17	0.061	0.616	0.368	10.2	18.7358	WBE
2014	0.028	0.153	0.081	0.19	0.1	0.618	0.213	9.9	19.675	WBE
2015	0.028	0.155	0.053	0.176	0.054	0.644	0.248	10.6	20.6688	WBE
2016	0.025	0.144	0.054	0.17	0.057	0.668	0.28	10.3	21.9094	WBE
2012	0.04	0.3	0.11	0.12	0.047	0.62	0.42	10	17.8192	UB
2013	0.02	0.19	0.12	0.12	0.054	0.66	0.26	10	18.7358	UB
2014	0.02	0.14	0.12	0.13	0.065	0.75	0.38	9	19.675	UB
2015	0.02	0.17	0.13	0.117	0.054	0.71	0.23	10	20.6688	UB
2016	0.02	0.18	0.13	0.12	0.11	0.73	0.22	11	21.9094	UB
2012	0.037	0.21	0.06	0.184	0.09	0.57	0.51	9	17.8192	NIB
2013	0.034	0.19	0.08	0.18	0.079	0.67	0.34	9	18.7358	NIB
2014	0.03	0.16	0.07	0.18	0.083	0.67	0.24	8	19.675	NIB
2015	0.028	0.16	0.08	0.16	0.058	0.73	0.18	9	20.6688	NIB
2016	0.027	0.17	0.09	0.159	0.086	0.8	0.24	9	21.9094	NIB
2012	0.03	0.31	0.05	0.11	0.38	0.57	0.44	10	17.8192	CBO
2013	0.04	0.37	0.04	0.11	0.08	0.44	0.76	11	18.7358	CBO

2014	0.05	0.38	0.07	0.15	0.23	0.48	0.34	13	19.675	CBO
2015	0.03	0.25	0.07	0.12	0.1	0.57	0.33	13	20.6688	CBO
2016	0	0.3	0.08	0.114	0.096	0.77	0.25	10	21.9094	CBO
2012	0.04	0.19	0.05	0.17	0.1	0.53	0.6	10	17.8192	LIB
2013	0.04	0.23	0.05	0.18	0.073	0.57	0.47	11	18.7358	LIB
2014	0.03	0.17	0.06	0.17	0.11	0.61	0.42	10	19.675	LIB
2015	0.03	0.21	0.05	0.14	0.058	0.51	0.34	13	20.6688	LIB
2016	0.0281	0.2074	0.0574	0.13	0.043	0.5892	0.2895	12.8	21.9094	LIB
2012	0.021	0.193	0.032	0.157	0.092	0.534	0.523	9.7	17.8192	OIB
2013	0.02	0.249	0.044	0.14	0.081	0.587	0.394	10	18.7358	OIB
2014	0.031	0.237	0.057	0.12	0.19	0.599	0.373	10.8	19.675	OIB
2015	0.027	0.136	0.053	0.1	0.2	0.677	0.23	9.7	20.6688	OIB
2016	0.021	0.135	0.067	0.12	0.19	0.736	0.23	10	21.9094	OIB
2012	0.043	0.331	0.019	0.117	0.059	0.386	0.502	13.3	17.8192	ZB
2013	0.033	0.243	0.018	0.15	0.056	0.371	0.448	14.4	18.7358	ZB
2014	0.051	0.32	0.032	0.167	0.07	0.451	0.493	12.7	19.675	ZB
2015	0.035	0.216	0.032	0.15	0.058	0.523	0.302	11.4	20.6688	ZB
2016	0.033	0.23	0.027	0.13	0.058	0.522	0.402	11.5	21.9094	ZB
2012	0.026	0.107	0.038	0.21	0.092	0.447	0.574	10.3	17.8192	BIB
2013	0.026	0.14	0.051	0.175	0.13	0.375	0.705	9.8	18.7358	BIB
2014	0.031	0.179	0.058	0.17	0.076	0.415	0.61	11.5	19.675	BIB
2015	0.036	0.225	0.063	0.15	0.056	0.234	0.639	12.8	20.6688	BIB
2016	0.033	0.229	0.069	0.14	0.056	0.233	0.668	13	21.9094	BIB
2012	0.031	0.174	0.035	0.18	0.045	0.529	0.61	9.9	17.8192	BBI
2013	0.03	0.172	0.031	0.17	0.11	0.612	0.464	8.2	18.7358	BBI
2014	0.018	0.096	0.06	0.196	0.065	0.66	0.488	10.1	19.675	BBI
2015	0.03	0.162	0.048	0.17	0.088	0.564	0.405	10.7	20.6688	BBI
2016	0.047	0.297	0.059	0.15	0.077	0.586	0.294	13.8	21.9094	BBI
2012	0.029	0.115	0.034	0.21	0.23	0.441	0.6	11.4	17.8192	AB
2013	0.024	0.128	0.047	0.17	0.13	0.519	0.387	10.7	18.7358	AB
2014	0.022	0.146	0.046	0.14	0.1	0.556	0.342	11.4	19.675	AB
2015	0.032	0.215	0.05	0.156	0.94	0.572	0.246	12.8	20.6688	AB
2016	0.027	0.177	0.057	0.15	0.089	0.66	0.234	11.8	21.9094	AB
2012	0.034	0.09	0.022	0.38	0.27	0.341	0.751	16.8	17.8192	ADIB
2013	0	0	0	0.27	0.21	0	0.531	0	18.7358	ADIB
2014	0.043	0.165	0.044	0.25	0.18	0.415	0.544	14	19.675	ADIB
2015	0.039	0.153	0.045	0.26	0.1	0.461	0.441	13.9	20.6688	ADIB
2016	0.039	0.152	0.051	0.26	0.1	0.513	0.491	14	21.9094	ADIB