ST.MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF COMMERCIAL BANKS PROFITABILITY:

THE CASE OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

BY:

SEWUNET BOSHO   DERESSA

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ADDIS ABABA, ETHIOPIA

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UNDER THE GUIDANCE OF:

ALEM HAGOS (PHD)

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Alem Hagos(PH.D). All source of Materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in fully to any other higher learning institution for the purpose of earning any degree.

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ACRONYMS AND ABBREVIATIONS

ADB-   African Development Bank

AIB-   Awash International Bank

BOA-   Bank Of Abyssinia

BS-   Bank Size

CA-   Capital Adequacy

CBO-   Cooperative Bank of Oromia

CLRM-   Classical Linear Regression Model

DB-   Dashen Bank

FE-   Fixed Effect

GDP-   Gross Domestic Product

ID-   Income Diversification

IMF-   International Monetary Fund

INF-   Inflation Rate

LI-   Liquidity

LIB-   Lion International Bank

Ln-   natural logarithm

MS-   Market Share

NBE-   National Bank of Ethiopia

NIB-   Nib International Bank

NIM   Net Income Margin

NPL-   Non-Performing Loan

OE-   Operation Efficiency

RE-   Random Effect

ROA-   Return On Asset

ROE-   Return On Equity

UB-   United Bank

WB-   Wegagen Bank

Abstract

The study was conducted on determinants of commercial banks profitability in the case of Ethiopian private commercial banks. Of total 16 private banks, 8 banks were sampled to represent total population. The study used pure quantitative approach using secondary data from banks and NBE for the period of 2007 to 2014.Also, the paper used linear multiple regression model under the fixed effect estimation. Dependent variable was measured by ROA. The explanatory variables included were bank internal factors (capital adequacy, liquidity, asset quality, operating efficiency, income diversification and bank size), a bank specific factor was market share and external factors included in the study were real GDP and inflation rate. The findings were consistent with Ethiopian and other country's previous studies. The findings indicated that income diversification, and market share were positively correlated and statistically significant determinants of bank profitability at 1% significance level. In addition, capital adequacy and real GDP were positively correlated with ROA and statistically significant determinants of bank profitability at 5% significance level. On the other hand, operating efficiency was statistically significant and negatively correlated to bank profitability at 1% significance level. Liquidity and inflation were found as insignificant to determine profitability. Even though, non-performing loan that was insignificant at 5% significance level, found as significant at 10% significance level and negatively correlated with profitability. The implication is that banks should take it into account since it is alerting. The study found that income diversification is not only determinants of bank profitability; in addition, it highly impacts profitability followed by real GDP. Finally, the study recommended that banks should consider income diversification, operating efficiency, market share and capital adequacy and also, banks have to focus on real GDP status.

Key Terms: Profitability, Determinants, Fixed Effect, Internal and External factors

CHAPTER ONE

INTRODUCTION

1.1   Background of the Study

Determinants of bank profitability have been studied both in developed countries and developing countries' emerging economies. Banking profitability has got its attention during 1940 in American banking (Heffernan 2005, as cited in Amdemikael, 2012). As noted in Bilal et al. (2013) any firm wants to earn profit and more profit to enhance its stakeholder's wealth. It is well known that economic growth within a country is dependent on the essential intermediary role of the banking sector. Therefore, achieving reasonable profit is challenging for banking sector and for achieving sustained economic growth stability. In modern financial system, banking industry contributes to economic development improving society's living standards.

Abiodun(2014) stated that policy makers, economist and monetary authorities use bank profitability status to make and estimate country's financial regulation and policies. Banks have to be profitable to enhance economic growth of one country and to facilitate growth of other sectors. Earning of banks hast to be stable and potential to finance other companies to expand their growth. Easier access to finance, accelerate investment which boost productivity, competitiveness and employment of the country (Flamini et al. 2009). Existence, growth and continuity of organizations depend on banks' sustainable profit. Accordingly, profitable entities pay income or dividend to its shareholders, create employment and contribute tax revenue to government and in such raise life standard of people.

Banks' profitability is affected by different environmental factors. Studies by Ponce and Flamini et al.(2009) and Athanasoglou et al.(2008), stated that banking profitability is affected by bank specific factors(capital adequacy, liquidity, asset quality, operating efficiency, bank size), industry specific includes market share and macroeconomic factors like Real Gross Domestic

Product and inflation. Determinants of bank profitability were carried out in developing countries like Nigeria. For instance, Obamuyi (2013 and 2011) studies show those factors determine banking profitability as internal factors (capital adequacy, bank size, liquidity, expense management, interest income) and macroeconomic factors like real GDP, inflation rate and interest level set by central bank. Studies of Guru et al. (2002), Badola and Verma (2006) studied bank profitability determinants as bank specific (capital adequacy, liquidity, expense management, overhead expense, asset and liability portfolio mix) and external factors (regulation, interest rate, market share and inflation) and industry specific as bank size and market share.

Profitability of any firm operated with profitability motivation is measured with instrument of dependent power variables. Different studies performed on bank profitability used dependent variables like return on asset, return on equity and interest income margin. For example, studies by Guru et al.(2002) , Berger(1995) and Scott (2011), Javaid et al.(2011) used Return on asset(ROA) for the measurement of bank profitability. In addition to ROA, return on equity (ROE) was used to measure the bank profitability in Turkey (Alper and Anbar, 2011).

The focus of this study is directed to determinants of privately owned commercial banks profitability in Ethiopia. Study on determinants of bank profitability in Ethiopia is too young as private[1] bank is not longed more than two decades. In line with other countries, determinants of bank profitability are also an issue of studies in Ethiopia. Studies were undertaken to show driver factors that impact profitability of banks. For instance, as mentioned by Tesfaye (2007 and 2014) bank internal factors(capital adequacy, asset quality, management efficiency, income diversification, liquidity) and industry specific(market structure, bank size and financial structure) and macroeconomic factors Real GDP and inflation rate) are factors affecting bank profitability. Researches by Habtamu(2012), Amdemikael(2012), Rao and Lakew (2012),Mehari

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[1] Started after proclamation No. 83/1994 under NBE

and Aemero(2013) have shown that bank specific factors (capital adequacy, liquidity, bank size, asset quality, income diversification and operational efficiency),firms specific like market share and macroeconomic factors like GDP, money supply growth and inflation rate have been identified as bank profitability determinants.

1.2 Overview of Banking in Ethiopia

Traditional financial system in Ethiopia has long history and significant contribution to economic growth and social development. The establishment of Ethiopian banking began towards the end of reign of emperor Minilik II. It was known as Bank of Abyssinia which was established during this period under the regulation set by British owned National Bank of Egypt. It has opened various branches within fifteen years throughout the country by the permission of the governor. As a result, despite its monopolistic position, the Bank earned no profit until 1914. Profits were recorded in 1919, 1920 and from 1924 onwards (Yesuf, 2010). The bank in its short life, it had been carrying out limited business such as keeping government accounts, some export financing and undertaking various tasks for the government. In addition to this, the service was given mostly to foreign business man and wealthy Ethiopian and the bank is mainly intended to profit making rather than economic development.

Following the fall of Dergue, 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 enabled the operation of private banks in Ethiopia. Following this proclamation, many private commercial banks operated and reached 16 in numbers as depicted in table1.1 (NBE,2014). These private commercial banks operated with the objective of wealth maximization. In 1997 four private commercial banks in operation shared 29% pretax profit whereas 71% was shared by state commercial banks. With the coming of two banks into operation (six private banks) pretax profit increased from 29% to 30.6% during 2000 business year. The same banks' pretax profit was increased to 35.5%

whereas state commercial banks' pretax profit during 2002 was decreased to 64.5%. The private commercial banks continued in making profit starting of their operation. With the coming of two private banks into operation as depicted in table 1.1, the pretax profit was increased to 41.8% and whereas the of state banks commercial banks profit decreased to 59.2% during 2007 period. As of 2012 and 2014, pretax profit of private banks was 30.2% and 32.2% respectively (from audited financial statement of each bank). Even though, banks were making profit, their profit was decreasing whereas that of state banks pretax profit was booming up. Therefore, profitability of banks has been challenged by different factors during this past decade. Therefore, the study focused to identify those factors imposed challenges on profitability.

Table 1.1: The list of private commercial banks in Ethiopia

No	Name of Bank	Establish-ment Year	No.	Name of Bank	Establish-ment year
1	Awash International Bank	1994	9	Oromia International Bank	2008
2	Dashen Bank	1995	10	Zemen Bank	2008
3	Abyssinia Bank	1996	11	Bunna International Bank	2009
4	Wegagen Bank	1997	12	Birhan International Bank	2009
5	United Bank	1998	13	Abay Bank	2010
6	Nib International Bank	1999	14	Addis International Bank	2011
7	Cooperative Bank of Oromia	2005	15	Debub Global bank	2012
8	Lion International Bank	2006	16	Enat International Bank	2013

Sources: (NBE Consolidated data report, 2014)

1.3   Statement of the Problem

Financial system contributes to economic development through clearing and settlement system, facilitation, resource channeling between borrowers and lenders (Tauranga, 2011). Bank plays important role in supporting economic development of the country. Commercial banks have function of serving as intermediation between those with excess money (depositors) and creditors. Role of banks in economies are financing (borrowing or lending), transferring money locally or globally and financing of trades. For any business entity to continue its operation there should be stable earning and growth (Sabo, 2007). As mentioned by Olweny and Shipho (2011) bank profitability has both national and international impact in spreading economic crises among countries. Profitability determines whether the bank has to continue its operation or has to cease it. To attain the objective of its stakeholders, the banks have to earn sound profit that maximizes shareholder's wealth.

Commercial banks in Sub-Saharan Africa (SSA) are running in profitability (IMF, 2009). The studies revealed that riskier asset are remunerated with higher return. As shown by Sabo (2011) banks are the only financial source in developing countries where financial markets are not developed. Many empirical studies found that bank profitability is influenced by different explanatory variables. As cited by Filamini et al.(2009), Athanasoglou et al.(2008) and Ponce(2009) stated banking profitability are affected by bank specific factors(capital adequacy, liquidity, asset quality, operational efficiency, income diversification and bank size), industry specific includes market share and macroeconomic factors like Real Gross Domestic Product and inflation.

Literature on determinants of bank profitability is reviewed and identified variables affect bank profitability. These literatures are mostly from Romania, Philippines, Malaysia and Europe banks. Accordingly, there is no universally accepted determinants of bank profitability due to economic factors are dynamic and differ in country. Their analysis included variables in context

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of their countries that affect bank profitability. Some Conclusion and findings were as per of studied country's policies, regulation and other affecting variables.

In Ethiopian context also determinants of bank profitability were studied by researchers. Studies of (Semu, 2010; Damena, 2010; Rao and Lakew,2012; Amdemikael,2012 and Tesfaye,2007 and 2014) conducted their studies on determinants of bank profitability in case of commercial banks in Ethiopia. Studies on determinants of bank profitability in case of private commercial banks are not sufficient to conclude about determinants of profitability. For example, Habtamu(2012) investigated on determinants of bank profitability on six private commercial banks using data covers 2001 to 2012 periods. However, the study excluded market share variable that affect profitability of the bank. In addition, Getnet (2014) conducted on determinants of bank profitability in case of six private commercial banks in Ethiopia using data covers 2001 to 2012 periods. The study was focused only on internal factors that affect bank profitability and excluded external factors like market share, real GDP and inflation rate that affect bank profitability as documented many empirical studies.

Accordingly, this study used to investigate the determinants of bank profitability on private commercial banks incorporating those missed factors using ROA as profitability measurement index. Those determinants of bank profitability are derived from balance and income statement through ratio quantification (capital adequacy, Asset quality, income diversification, liquidity, operating efficiency and bank size), industry specific like market share and external variables like economic growth and inflation rate. In addition to studies of Habtamu (2012) and Getnet (2014), the study included Cooperative Bank of Oromia Sc and Lion International Bank Sc and incorporated data of each bank (2007-2014) for analysis.

1.4 Research Questions (RQ)

In line to the statement of the purpose, the research sought to answer the following question.

RQ- what are the effects of these factors on profitability of Ethiopian private commercial banks for the period of 2007 to 2014?

1.5   Objective of the Study

Objective of the study designed as general and specific objectives of the study.

1.5.1   General Objective of the Study

The main objective of the study was to investigate the determinants of profitability in Ethiopian private commercial banks for the period of 2007 to 2014.

1.5.2   Specific Objectives of the Study

The specific objective of this study involves:

1. To determine the effect of capital adequacy on private commercial bank profitability.

2. To determine the effect of asset quality on private commercial bank profitability.

3. To investigate the effect of liquidity risk on private commercial bank profitability.

4. To determine the effect of income diversification on private commercial bank profitability.

5. To investigate the effect of operating efficiency on private commercial bank profitability.

6. To investigate the influence of bank size on private commercial bank profitability.

7. To determine the effect of market share, Real GDP and Inflation rate on private commercial profitability banks profitability.

Finally, to make feasible recommendations addressing identified problems of private commercial banks' profitability in Ethiopia.

1.6   Hypotheses of the Study (HP)

Hypotheses of the study are based on theories of bank profitability and empirical studies developed over the years by researchers on banking area. Marcoulides (1998) defined deductive approach as testing of theories. Researchers proceed with set of theories and percepts of

knowledge in mind to set study's hypotheses. More formal way of stating research question is by developing hypotheses between independent and dependent variables (Creswell, 2009). It may be stated in null form indicating no relationship between dependent and controlling variables. Developed hypotheses are as follow: Null Hypotheses (Ho) developed as follow:

*Ho1.*There is no significant relationship between capital adequacy and profitability of Ethiopian private commercial banks for the period 2007 to 2014[2].

*Ho2.*There is no significant relationship between liquidity and profitability of Ethiopian private commercial banks for the period 2007 to 2014

*Ho3.*There is no significant relationship between asset quality and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014

*Ho4.*There is no significant relationship between operational efficiency and profitability of Ethiopian private commercial banks for the period 2007 to 2014

*Ho5.*There is no significant correlation between income diversification and profitability of Ethiopian private commercial banks for the period 2007 to 2014.

*Ho6.*There is no significant relationship between bank size and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

*Ho7.*There is no significant relationship between market share and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

*Ho8.*There is no significant relationship between Real GDP and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

*Ho9.*There is no significant relationship between Inflation rate and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

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[2] 1, 2, 3, 4, 5, 6, 7, 8 &9 The Alternate Hypotheses (HA) says there is significant relationship between capital adequacy and bank profitability from 2007 to 2014. Subsequently, the rest HA derived similarly.

1.7 Scope of the Study

The study is restricted in investigating internal and external determinant factors affecting profitability of private commercial banks in Ethiopia. Of sixteen private banks, the researcher selected eight banks registered under National Bank of Ethiopia as commercial banks. The study purposively selected those banks based on deposit, branch network and capital level to represent the population. Those banks are Awash International Bank, Dashen Bank, Bank Of Abyssinia, Wegagen Bank, United Bank, Nib International Bank, Cooperative Bank of Oromia and Lion International Bank. The study has used data of the past eight years (2007-2014). In addition, explanatory variables were subjected to key internal factors, bank specific and external factors. The study used pure quantitative data only to investigate how much historical data determine bank profitability in private commercial banks.

1.8 Limitation of the Study

The study used data of 2007 to 2014 to include banks like Cooperative Bank of Oromia and Lion International Bank which came to operation during 2005 and 2006 respectively. The researcher faced sample number problem due to these two banks have only 8 years of life history and have made not to have more than 64 observations. Accordingly, the researcher used panel data to minimize sample problem encountered the study. Absence of some banks' audited financial statements on website was also imposed constraint on researcher. Therefore, the researcher collected print out of these audited financial statements from each bank to overcome the problem.

1.9 Significance of the Study

The study sought to contribute on factors influence profitability of banks. The study was conducted on determinants of profitability in case of Ethiopian private commercial banks and the study would induce bank management and concerned organs on determinants of bank profitability. Accordingly, the study would have the following significances.

❖ The study helps Ethiopian private commercial banks and regulatory organ to have enriched knowledge on how capital adequacy affects profitability.

❖ The study will help branch managers, finance managers and banks management to knowhow operating efficiency and income diversification determine level of profitability. In addition, the study helps operation and branch managers to know the relationship between market share   and profitability

❖ The study enriches knowledge of bank management on real GDP of the country and its impacts on profitability.

❖ The study may support as reference coming researcher(s) who study on the areas.

1.10   Structure of the Paper

The paper was organized as follow. The first chapter presented introduction followed by second chapter which presented literature review. The third chapter presented methodology and design as blue print of the study. Chapter four presented data analysis and discussion of the paper. Finally, chapter five of this study concluded the findings and presented recommendation based on the findings.

CHAPTER TWO: LITERATURE REVIEW

This part deals with presenting related theoretical and empirical studies on bank profitability. The first section presented theories of bank profitability determinants. Then, empirical studies on other countries' commercial banks and Ethiopian commercial banks profitability determinants were presented. Finally, Knowledge gap followed by conceptual framework for the study were presented.

2.1   Theories Related To Determinants of Bank Profitability.

This part builds theories related bank profitability identifying types of factors and from where they emanated. As aforementioned in introduction part, profitability of banks categorized as internal factors that affect balance sheet and income statement of the bank and external factors that influence profitability beyond the management control (Al-Tamimi, 2010)

2.1.1   Internal Determinants of Bank Profitability

Tesfaye(2014) has stated that internal determinants of bank profitability are factors influenced by management decisions and policies. These decisions or influence financial profitability of an entity. Operation result affected by these management effects are balance sheet and profit and loss statement of the bank.

2.1.2   Balance sheet components

Balance sheet is an integral part of financial statements that reveals the financial position of a bank at a single point in time. It reflects management efficiency and resource allocation indicating earning power and financing structure of the bank. From balance sheet view financial determinants that receive management attentions are capital adequacy, liquidity, loan composition and size (Meiges et al., 1996)

Capital Adequacy: Capital adequacy is valuable tool for assessing capital adequacy showing safety and soundness of banks. Well capitalized bank has the advantage of reducing costs of financial distress and translated saved cost into profit. According to African Development

Bank(ADB, 2006 as cited by Habtamu (2012) size of the bank has an impact on generating profit as size of capital provides financial flexibility for banks and financial institutions. Portfolio mix or financing mix increase size of capital increasing return on asset and hence reduces risks.

Liquidity: A bank or financial institution is required to be liquid to meet need of depositors at any time. Asset Liability Management gives concern for banks liquidity to keep balance of demand and supply that exist between depositors (lenders) and creditors. Liquidity is keeping the bank to meet its obligation of payment and hence it is challenging to remain as moderate liquid. According to samad et al.(2001) and Pak and Huh(1995) extreme liquidity and illiquidity results to loss . Extreme liquidity implies that bank holding deposits and bank is losing interest that would have been brings potential profit. On the other hand, illiquidity exposes the bank to unnecessary financing activities or high interest rate financing.

Asset Quality: Asset quality is the ability to deal with credit risk for a bank or financial institutions reflecting composition and productivity of the assets. As cited by Habtamu(2012), the studies of Yuqi (2006) stated that risk of poor asset quality is a major cause of poor profitability and is evaluated by profitability of asset category. Therefore, an asset quality is measured by non-performing loan, provision /writes off loan to total loans. In general non-performing loan indicates for further breaking loan category and to identifies which loan categories holds significant non- performing loan ratios. This needs management due attention for risk mitigation African Development Bank (ADB, 2006).

Bank size: Size of the bank accounts for related economies of scale and diseconomies of scale. According to Indranarain (2009) bank size is measured by total asset of the bank. It is well documented that total asset is used as proxy of bank size. Total asset may deflate return on asset and hence it is appropriate to take natural logarithm of total asset before applying it into the model. This is to overcome large size scale of total asset. Larger banks enjoy higher level of profits due to economic scale utilization that decrease costs.

2.1.3 Income Statement Components

As mentioned so far balance sheet focuses on bank's financial position for a given period of time while income statement concentrates on success of operation over a given period of time. Financial ratios obtained from income statement reveals management efficiency in generating revenues and also controlling costs. Profitability constructed from income statement reveals efficiency in expense management and interest income. Interest income that derived from income statement measure management portfolio diversifying and risk mitigating ability.

Operation Efficiency: Operational efficiency measures bank profitability as literature on bank profitability conformed it. According to the studies of Sufian and Chong (2008) poor expense management are the main contributors for poor profitability. Even though there is inverse relationship between expenditure and profits, higher expense means lower profit and the reverse is not always the case. The reason is that higher amounts of expense may be due to higher volume of activities and then higher profits. As stated by Flamini et al.(2009) and Neceur(2003) there is positive correlation between overheads costs and profitability. Banks in uncompetitive market enjoy market power by transferring costs to depositors and banks as lenders may lower deposit rates or increase lending rates.

Diversification of Income: The concept of revenue diversification is introduced from portfolio theory implying to reduce firm-specific risk through diversifying their portfolios. Along history argued that benefits of diversification for stable and less volatile profit and capitalizes managerial efficiency against its cost of diversification as per Choi and Kotrozo(2006).

Chiorazzo et al.(2008) noted that as a result of activity diversification, economies of scale and scope caused through the joint production of financial activities that leads to increase in efficiency of banking industry. Uzhegova(2010) further argued portfolio mix minimize total risks because income from non-interest income is not correlated with income from charge fee and hence then diversification stabilize operating income and gives stable profits.

2.2 Bank Specific and External Determinants of Bank Profitability

Operation and profitability's of financial institutions are affected by external determinants like economic and legal environment that are beyond the control of bank management.

Market Share: Expansion in market share brings to economic scale and that enlarge deposit. As investigated by Jambere (2014) deposit and market share have direct relationship and increase profitability of bank. A market power hypothesis asserts that only firms with income differentiation and market power are able to extract sound able profit (Berger, 1995a).Structure-conduct performance (SCP) hypothesis asserts that banks are able to extract monopolistic rent in concentrated markets by their ability to offer lower deposits rates and charge higher loan rates. According to Berger(1995) and Lloyd-William et al.(1994) stated that related theory is the relative market- power hypothesis (RMP) which asserts only firms with large market shares and well diversified products are able to exercise market power in pricing these products and earn supernormal profit.

Real Gross Domestic Product: It affects banking profitability in a number of ways. Economic growth is measured by real GDP sector profitability as of (Belayneh, 2011 and Athanasoglou et al., 2008). First there will be higher demand for bank credit in times of economic boom than in times of recessions. This implies that there is positive relationship between bank profitability and GDP development.

Inflation (INF): High inflation is associated with higher costs as well as higher income. If a bank's income rises more rapidly than its costs, inflation is expected to bring a positive effect on profitability. John and Bruce (2006) suggested that inflation reduces bank lending to private sector lowering credit volume. Several economists have found that countries with high inflation rates have inefficiently small banking sectors and equity markets.

2.3 Structural Approach to Bank Efficiency Measurement

The structural approach relies on the cost minimization or profit maximization whereas the structural performance denotes us if the firm is technically efficient (Hughes, 2008)

2.3.1 The Efficiency Theory

This theory asserts that banks earn high profits due to they are more efficient than others. According to Athanasoglou et al. (2006), there are two distinct approaches namely X-efficiency approach and Scale-efficiency hypothesis. X –efficiency indicates that more efficient firms earn high profit because of lower costs. Firms of this character come to larger market share covering high levels of market concentration. However, there is no the tendency of causal relationship between market concentration and profitability. The implication is that as market concentration increases, bank profitability does not directly increase. On the other hand, the scale approach give emphasizes on economies of scale instead of differences in management or means of productions. Based on the output-input allocation efficiency, larger firms obtain lower unit cost and then, higher profit through economies of scale. This makes large firms to share market shares which may manifest them to have higher market concentrations and profitability.

2.3.2 The Balanced Portfolio Theory: Profit Maximization and Cost Minimization

Nzongang and Athemnkeng(2006) stated that portfolio theory approach is most relevant and plays important role in bank performances. The structural performance assumes that all banks equally efficient at minimizing cost or maximizing profit. According to the portfolio balance model, asset diversification is optimum holding of each asset in portfolio mixes. Portfolio mix is determined by a number of factors such as rates of return on all asset held in the portfolio and risk related with each financial asset and size of portfolio. The implication is that portfolio diversification and desired portfolio composition are the result of decisions taken by bank management. Further, the ability to obtain maximum profits depends on the sound set of assets

and liabilities determined by management and the unit costs incurred by the bank for producing each component of assets.

2.4   Profitability Measurement

One of the most frequently used tools of financial ratios analysis is profitability ratio that determines entity's profitability. This ratio reveals company's overall efficiency and profitability. Return ratios indicates overall efficiency of the firm in generating returns for its shareholders. As mentioned by Rao and Lakew (2012), studies explored that bank profitability may be measured by one or in the combination of NIM (Net Interest Margin), ROE (Return On Equity) and ROA (Return On Asset) as measure of profitability. These are:

A. **Return on Assets (ROA)**: It measures the efficiency with which the company is managing its investment in asset and using them to generate profit and hence it is very important profit ratio. It measures amount of profit earned in relative to firm's investment in total asset (Roman and Danuletiu, 2013). It constitutes total asset from balance sheet and net profit from income statement. Higher the ratio implies company is efficiently utilizing asset to generate revenues. Then calculation is ROA= Net profit/Total Asset

B. **Return on Equity (ROE)**: It measures the return on the money the investors have put in the company (Maredza, 2013). On the other hand, ROE indicates the degree to which bank's management is generating return using shareholders' equity (Guru et al.,(1999). It guarantees investors where to invest their capital to maximize their wealth in relation to firms in the industry the elements of measurement are constituted from income statement and balance sheet. Then ROE=Net profit/Equity However, ROE disregards risks associated with return on asset and financial assets (IMF, 2009)

C. **Net Interest Margin (NIM)**: It is the difference between interest income and interest expense (Yusuf, 2010). Maredza (2014) stated that NIM has limitation due to the fact it considers only part of profit (interest income) and measures it to loan and advances granted. Higher ratio

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indicates cheaper financing or obtaining funds. Hence, it is measured as NIM= net interest income/interest bearing asset

2.5 Empirical Studies on Determinants of Bank Profitability

This part presented studies of different scholars on the relationship between explanatory variables and dependent variable (bank profitability). Then, emprecial studies presented on time chronological.

Staikouras and Wood(2000) conducted studies on 685 European banks taking period of 1994 to 1998 using panel data with ordinary least square (OLS) and fixed effect for variance control. The studies considered bank specific factors (capital strength, loan quality, operation efficiency, and bank size and income diversification) and external factors like market share and GDP. The study found that capital adequacy and loan loss provision to total loan were significant and positively correlated with ROA. But, market share impacted profitability negatively. Total loan to total asset ratios and ROA are negatively correlated. Large loan size results poor bank profitability. In addition to this, interest rate impacted profit positively. But variability of interest rate and GDP has negative impact.

 Guru et al.,(1999) has conducted the study to identify factors determine success of deposit banking by taking seventeen Malaysian commercial banks for the period of 1986 to 1995. The study used both micro variables (capital adequacy, liquidity and expense management) and macro variables (ownership, firm size and inflation) and then the study found that inflation and expense management are the most significant factors affecting bank profitability negatively in Malaysia.

Kosmidou et al.(2006) investigated factors affect profitability of UK domestic commercial banks from the period of 1995 to 2002. The study employed three profitability measurements (ROA, ROE and NIM) to determine the effect of explanatory variables. The finding indicated capital strength is the major significant positively affect UK owned commercial bank's

profitability. Operation efficiency or cost to income ratio and bank size has significant and positive impact on both UK's bank profitability (ROA and NIM). Liquidity impact has positive impact on ROA but negative effect on NIM. Loan loss reserve to total loan has positive and significant on NIM but has no significant impact on ROA. Specially, all external variables (Economic growth, concentration and inflation) have positive and significant on bank profitability.

Kosmidou (2008) investigated impact of internal and external factors on bank profitability taking 23 commercial banks in Greece from the period of 1990-2002. The study used unbalanced time series. The study found that high capital, lower cost to income ratio, bank size and real GDP are positively correlated with ROA. Specially, inflation had significant negative effect on profitability.

Flamini et al. (2009), conducted on 389 banks in 41 Sub-Saharan African (SSA) countries to examine determinants of bank profitability. The study considered credit risk, income diversification, bank size, market power, GDP and inflation as factors to influence bank profitability in the region. Then, the investigation found that bank size, income diversification and private ownership have positive impact on ROA as wells as macroeconomic variables impacted profitability.

Olweny and Shipho(2011) conducted determinants of commercial banks in Kenya. The study conducted on 38 Kenyan commercial banks from 2002 to 2008 as panel data. The study found capital adequacy, liquidity and income diversification are statistically significant and positively correlated with ROA. On the other hand, operation efficiency measured as non-interest income to total income and asset quality are statistically significant and negatively correlated with ROA.

Roman and Danuletiu (2013) conducted on fifteen commercial banks of Romania from the period of 2003 to 2011(panel data). The study found that bank size and real GDP are positively significant to determine bank profitability in Romania. Both Income diversification and bank

inflation are negatively correlated with bank profitability but found statistically insignificant. On the other hand liquidity is found to be negatively influence bank profitability (ROA).

Jaber and Al-khawaldeh (2014) has studied on 11 domestic commercial banks in Jordan taking the data from 2007 to 2012(Panel data). The study used ROA and ROE for profitability measurement. The study found operational efficiency is negatively significant on ROA whereas capital adequacy, inflation rate and real gross domestic product are positively significant on ROA. However, bank size with positive and liquidity with negative relationship with ROA found to be insignificant.

Ayanda et al.(2013), conducted on determinants of bank profitability in case of First Bank of Nigeria Plc over the period, 1980 to 2010(time series data) using secondary data. The study used total asset, non-interest income, loan loss provisions and overhead expenses as internal factors and real GDP, money supply and inflation rate as macroeconomic factors. The study found that bank size (in total asset and branch network) did not affect Nigerian banks profitability.

Credit risk measured by loan loss to total asset and capital adequacy were found to be significant drivers which affect bank profitability both in long and short run respectively. Also, liquidity, affected bank profitability in the short run whereas labor efficiency (Human Capital, ROI and staff salaries measured as total asset) only affected profitability in the long run. Of external factors, only money supply affects bank profitability both in short and long run in Nigeria.

Maredza(2014), conducted on determinants of bank profitability in South Africa from 2005-2011 on eight banks. The study used fixed effect for regression estimation as N=T=8 for panel data. The study found capital adequacy positively significant and influences ROA. On the other hand, liquidity, non -performing loan, operation efficiency, bank size and income diversification have statistically significant negative influence on banks profitability.

Ali et al., (2014), conducted on determinants of bank profitability in case of 17 Pakistan commercial banks over the period of 2004 to 2010. The study found that capital strength of a

bank is most significant in affecting its profitability implying that well capitalized banks observed to be less risky and such edge brings them to profitability. The asset quality measured by the loan loss provision affects the performance of banks positively and bank size measured as deposit indicates direct relationship with profitability. The implication is as large banks earn more profit than small banks. In addition, inflation found as affecting banks profitability negatively.

2.6 Previous Studies on Ethiopian Banks

To build knowledge on determinants of bank profitability, Ethiopian contextual studies have significant values for the study. These studies as follows.

Damena (2011), conducted on determinants of bank profitability in case of seven Ethiopian commercial banks over the period of 2001 to 2010. The study used balanced panel data using OLS estimator. The study found that capital adequacy, income diversification and bank size have significant influence on bank profitability(ROA).Market concentration was also found as factor significantly influencing bank profitability. Of macroeconomic variables, only real GDP was found as determinants of bank profitability.

The research by Semu (2010) conducted on Ethiopian commercial banks taking the period of 2005 to 2009. The study used quantitative method to know influence of bank profitability using ROA and ROE measurements. The study found that capital adequacy ratio has positive significant relationship with ROA and even though liquidity has negative relationship with ROA, statistically found to be insignificant.

Amdemikael(2012) has studied 8 commercial banks'(two state owned and six private banks) profitability determinants covering period 2000 to 2011. The study used documentary reviews and in-depth interview and adopted mixed approach research method for the study. The study has used econometrics analysis and OLS techniques. The result is capital strength, income diversification; bank size and GDP have statistically significant and positive relationship with

bank's profitability. On the other hand, operational efficiency and asset quality have significant and negative impact with profitability. However, liquidity risk and inflation are found to have negative relationship with ROA and found to be statistically insignificant.

Habtamu(2012) has investigated determinants of private commercial bank profitability in Ethiopia by using panel data of six private commercial banks from year 2002 to 2011. The study used quantitative research approach and estimated regression by fixed effect. The study found that capital adequacy, asset quality, bank size and GDP have positive significant influence on private commercial bank profitability (ROA) whereas liquidity has negative relationship with profitability.

Tesfaye (2014) investigated the determinants Ethiopian commercial bank profitability taking data from 1990-2012 periods. The study used secondary data and used ROA as profitability measurement index adopting econometrics and descriptive analysis. Explanatory variables used were internal and external variables. Income diversification, liquidity, capital adequacy and bank size positively correlated with ROA but statistically insignificant. Credit risk and operational efficiency have negative insignificant relationship with bank profitability (ROA) and whereas macroeconomic variables like real GDP have no significant impact on bank's profitability. However, inflation rate is determined as significant driver to the profitability of Ethiopian commercial banks.

Rao and Lakew(2012) looked at the key factors that influence commercial bank in Ethiopia using unbalanced panel data from 1999/00-2008/09 periods. Factors were regressed against ROA to determine their effect. Fixed effect was used to control unobservable characteristics of internal factors. The fixed effect was used following the Hausman and Chi- square. Internal factors considered were capital adequacy, liquidity, asset quality, asset quality, operation efficiency and market share, real GDP and inflation rate were used as external variables. The study found that capital adequacy, income diversification and bank size have positive and significant impact on

profitability of Ethiopian commercial banks whereas liquidity and operational efficiency are negatively affect profitability of banks. Loan loss to total loans is found to be having negative impact on profitability though it is statistically insignificant. Market share measured as deposit of each banks to all total deposit of commercial banks are found to be positively related to ROA but statistically insignificant. The inflation and GDP are found to be insignificant on bank profitability.

2.7   Knowledge Gap and Conclusions

Literatures on determinants of bank profitability were reviewed and identified those variables affect bank profitability. These literatures are mostly from Romania, Philippines, Malaysia and Europe banks. Their analysis included variables in context of variables that affect their countries bank profitability. Some Conclusion and findings were as per of studied countries policies, regulation and other affecting variables.

In Ethiopian context also some researchers have conducted on determinants of bank profitability. The study of these researchers used sample from both state owned and privately owned banks to represent all Ethiopian commercial banks. Studies of Semu (2010); Rao and Lakew(2012); Amdemikael (2012) and Tesfaye (2007 and 2014) conducted studies on determinants of profitability of commercial banks in Ethiopia. All of these studies have included in the study giant state owned commercial Bank of Ethiopia (CBE) as sample of study. For instance, CBE has market share in deposit 58.30% and 65.9% during 2011 and 2012 respectively compared to private commercial banks (NBE, 2014). Gujarati (2004) stated that when small firms and large firms together incorporated in the study and regressed, the result may be biased by some outliners that create heterosedasticity. In addition, it may affect descriptive statistics like mean for the fact that mean is more sensitive to outliners. Bank size which is measured by total asset, and market share measured by total deposit or number of branches may affect results of the studies due to huge Commercial Bank of Ethiopia(CBE) was included in the study. As such,

private banks Market share incorporated in the studies may be small relative to CBE. Therefore, this study intended to include only private commercial banks to have consistency of bank size and to minimize data outliners.

On the other hand, Habtamu (2012) investigated the determinants of bank profitability on selected six private commercial banks (excluding Cooperative Bank of Oromia and Lion International Bank) which are currently emerging to medium banks. Lion International Bank's total asset reached 2.94 billion as of 2013/2014 which shows bank size is increasing (LIB annual report 2013/2014). For example, Cooperative Bank of Oromia registered pretax profit of 475.85 million during 2013/2014 and become the third profit maker irrespective its age (CBE annual report 2013/2014). Therefore, the study used to include these emerging banks to represent total private commercial banks in Ethiopia. Also, Habtamu (2012) excluded very important variable like market share which have relationship with profitability. For example, previous study by Amdemikael (2012) found that there was significant relationship between market share and bank profitability. As result, the study used to include the variable to investigate its influence on bank profitability. In addition, Getenet (2014) conducted on determinants of bank profitability in case of six private commercial banks in Ethiopia using data covers 2001 to 2012 periods. The study focused only on internal factors that affect bank profitability and excluded bank specific like market share, and external factors like real GDP and inflation rate that affect bank profitability as documented in many empirical studies.

Accordingly, this study used to investigate the determinants of bank profitability on private commercial banks incorporating those missed factors using ROA as profitability measurement index

2.8 Conceptual Framework for the Study

Independent variables

Internal Factors:	Bank Specific Factor:	External Factors:
Capital Adequacy	Market Share	Real GDP
Operation Efficiency		Inflation Rate
Liquidity		
Income Diversification		
Asset Quality		
Bank Size		

Dependent Variable

ROA
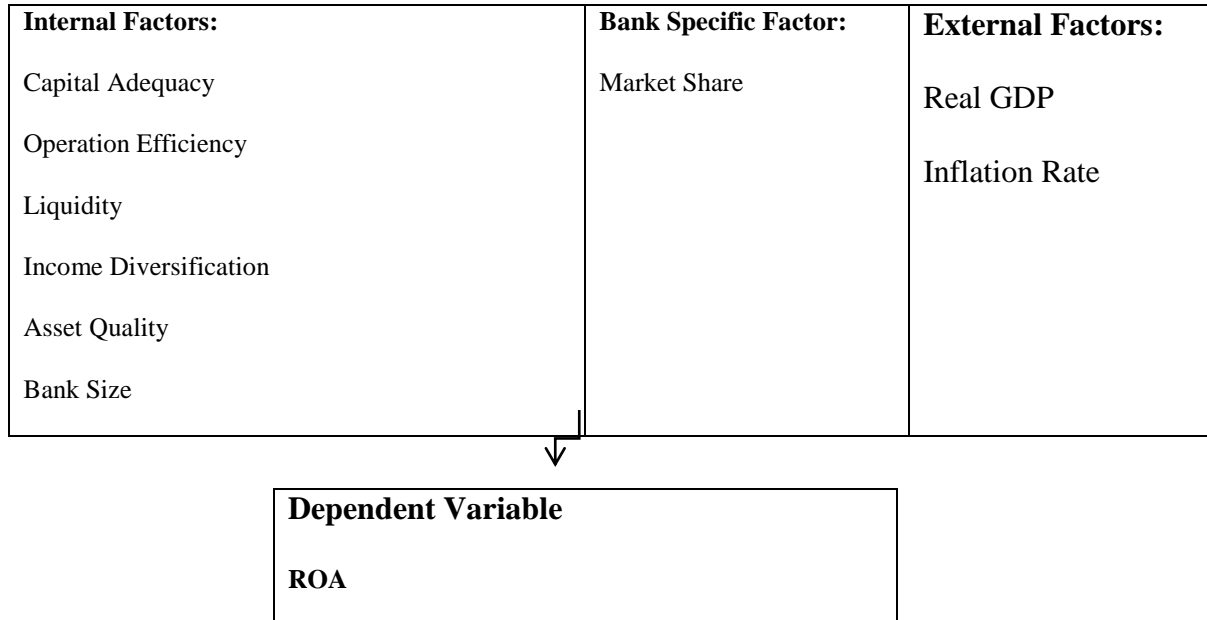
Source: Conceptualized from literature review (2015)

This framework for the study indicated internal factors (capital adequacy, liquidity, asset quality, operating efficiency, income diversification and bank size). These internal factors were obtained from audited financial statements of each bank through ratio quantification. Basic bank specific factor included was market share. Bank specific factor (market share) was measured by total deposit of each bank to total deposit from all private commercial banks in Ethiopia. Therefore, bank internal factors quantified ratios of each banks without pooling ratios of all banks together whereas bank specific factor used total deposit of all private banks to quantify market share ratios. External factors include ownership policy by NBE, secondary market, real GDP and inflation rate. Under the utilization of pure quantitative approach inclusion of ownership policy may affect result interpretation and for there is no secondary market in Ethiopia, secondary market as variable was omitted from the study. As result, the study included real GDP and inflation rate from external variables. To recognize the effect of these explanatory variables, the study used ROA as profitability measurement index.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

This chapter set up how data were collected and analyzed. This chapter presented research approach, sample design, data source and collection techniques, variables specification and model specification for the study.

3.1 Research Approach

Creswell (2003) stated that quantitative approach is used to verify theories and to establish hypotheses between independent and dependent variables. This study used pure quantitative approach as it utilized statistical procedures to relate and verify relation of variables. This study began with statement of the problem and following research questions and it has built hypotheses and reviewed literatures. Tesfaye (2014) has used secondary data review for determinants of Ethiopian commercial bank profitability. As a result, numerical data was collected from each banks' audited financial statements, National bank of Ethiopia annual report and Ethiopian Ministry of Finance and Economic Development data.

3.2 Sample Design and Sample Selection

Currently, there are 16 private commercial banks in Ethiopia (NBE, 2014). Study undertaken purposive sampling techniques with the objective of banks that have to be sampled for the study should have at least eight years' service life. In addition, the study purposively used total deposit, branches network and capital level to select those banks which have to be sampled. Accordingly, those banks who have eight years' service of life were Awash International Bank, Dashen Bank, Bank of Abyssinia, Wagagen Bank, United bank, Nib International Bank, Cooperative Bank of Oromia and Lion International Bank. Accordingly, these banks accounted for 82%, 71.6% and 78% of private commercial banks in total deposit, branch network and capital share (NBE, 2014) respectively. Therefore, these banks sampled to represent all private (sixteen) commercial banks in Ethiopia. The study used balanced panel data (cross sectional and time series) as it overcome data omission problems. Panel data allows controlling for omitted (unobserved) variables.

Again, it helps researcher to have large data point and increase degree of freedom and reduces co linearity among explanatory variables. Hence, improves efficiency of econometric estimates (Hasio, 2003 and Gujarati, 2009). Accordingly, the study used 8 years data (2007-2014) and eight banks for the study.

3.3 Data Source and Collection Method

This study used secondary data sources to attain the objective of the study. Audited financial statements of each bank (2007-2014) for consecutive 8 years were utilized. To study the relationship between profitability and macroeconomic factors, the same year data was collected. In accordingly, macroeconomic data was collected from report and Publication of National Bank of Ethiopia and ministry of Finance and Economic Development

3.4 Variable Specification and Measurement

These variables are dependent and independent variables.

3.4.1 Dependent Variable

The choice of profitability ratio Return On Asset (ROA), Return On Equity (ROE) and Net Income Margin (NIM) depends on the objective profitability measure since each of profitability measure may differ in objective (Rao and Lakew, 2012). ROA is popular over ROE and NIM due to the fact that it shows profit earned per birr of asset indicating how the bank management utilizing to generate return from asset (Maredz, 2014). ROA is measured as net income to total asset (Net income/total asset)[3]. Off balance sheet activities may bias Return on asset. To overcome this limitation, the study takes into account average values of consecutive year end balance sheet figures. Net income margin measure measures only parts of profit whereas return on equity measures capital put in investment disregarding risk associated with return on asset and financial asset (IMF,2009). For these reason, the study used ROA as profit measure index

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[3] NBE used ROA for bank measurement

consistently with studies of Amdemikael (2012), Rao and Lakew(2012) Tesfaye(2014),Roman and Danuletiu(2013) and Maredza (2013).

3.4.2 Explanatory Variables

According to the literature, independent variables are represented by bank internal factors, bank specific and macroeconomic factors that influence profitability of the bank. Based on empirical studies focused on evaluating determinants of bank's profitability, the determinants of bank profitability grouped into two. These are internal factors namely capital adequacy, asset quality, liquidity, income diversification, operational efficiency and bank size), bank specific factors like market share and external factors macroeconomic (Real GDP and inflation rate)

3.4.2.1 Bank Specific Variables

These variables are influenced by internal management decision and policies. Thus, the impact of internal factors on bank profitability can be analyzed looking from balance sheet and profit and loss statement of concerned commercial bank.

Capital Adequacy: This measures capital strength or capital structure. Equity to asset ratio shows how asset of banks are funded by owners' equity. Proxy of bank's capital adequacy estimates the ability of the bank to absorb probable loss. As this ratio is the measure of capital strength, commercial bank with high equity to asset ratio are assumed to be safe in the period of loss and liquidity problem (Kosmidou, 2008).This implies that if a bank face serious asset quality problem and loan loss reserve is insufficient to write off bad debt, the bank able to write off bad debt using shareholder's equity. As mentioned by Berger (1995b), high equity to asset ratio reduces financing cost and increases profitability. On another hand, asset with higher risk also with higher return. Therefore, it is difficult to predict the sign of capital adequacy on profitability. Thus, in view of the above argument, the student researcher framed theFollowing hypothesis.

Ho1.There is no significant relationship between capital adequacy and profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Liquidity: Is a major important for evaluating profitability of the bank, reflecting the capacity to payback debt on short term and cope up with unexpected withdrawals by depositors(Roman and Danelitiu,2013). Ratio of liquidity measures as total liquid asset to total deposit (Rao and Lakew, 2012). In addition, Olweney and shipho conducted on determinants of commercial bank profitability measured liquidity as current asset to total deposit. A lower ratio implies that bank does not get fund easily to finance its shortage without incurring high interest rate[4]. On the other hand, since liquid asset is short term asset it is expected to give lower return. In addition, holding excess liquid asset exposes banks to the loss of interest income. This makes liquidity risk impacts bank profitability negatively. Hence, the student researcher sets the following hypothesis.

Ho2. There is no significant relationship between liquidity and profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Asset Quality: The asset side of bank's balance sheet is another variable that affect bank profitability. Total asset includes cash, deposit with banks including reserves at NBE, Loan, investment and fixed asset and others (Tesfaye, 2014). According to Olweny and shipho (2011) the non-performing loan to gross loan is the measure of asset quality (NPL/Total loan)[5]. The increase in doubtful, income which does not accrue income requires the bank to allocate its significant portion of its gross margin to provision to cover expected credit loss; thus, profitability will be lower. Bad loans are expected to curtail the profitability of a bank and the loan loss to total loans ratio is expected to negatively affect bank profitability. Following these literature and empirical investigation, the following hypothesis has been formulated.

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[4] National Bank of Ethiopia(2013), has set the minimum liquid asset of the Bank not to be less than 15% of the Bank's net current liability

[5] NBE has limited NPL size to 5% of its total loan

Ho3: There is no significant relationship between asset quality and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Operational Efficiency: It is the analysis of operating expense (non- interest expense) to total profit (Maredza, 2014). The study of Olweny and Shipho(2011) on determinants of commercial bank profitability used non- interest expense to total income. In Ethiopia regulator organ (NBE) has not set quantitative computation for operational efficiency (Tesfaye, 2014). The higher ratio indicates inefficiency of cost management. This includes salaries and payment employees and as well as other operating expenses. Therefore, there is negative relationship between bank profitability and operation expense. Following these evidences, the following hypothesis is formulated.

Ho4. There is no significant relationship between operational efficiency and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Income Diversification: It is percentage of bank's income other than interest income to total income (non-interest income/total asset). It constitutes essential proxy variables for bank's non-traditional activities. Banks diversify in order to reduce exposure to interest sensitive income and to decrease exposure to risks (Maredza, 2014 and Amdemikeal, 2012). A bank diversifies well, boost its income and hence, income diversification affect bank's profit positively. Hence, income diversification has expected positive sign on bank profitability (Rao and Lakew, 2012). Then, hypothesis is formulated as follow.

Ho5. There is no significant between Income diversification and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Bank size: Bank size accounts for existence of economies of scale and diseconomies of scale (Naceur and Goaied, 2008).It is measured as natural logarithm of Total asset (Saona, 2011). Economic theory suggest market structure affects firm's profitability(Haron, 1996) and if industry is subject to economies of scale, larger institution serve at lower cost(Rasiah,2010a).

The bank size increase as there is economies of scale and decrease as there is diseconomies of scale. Therefore, expectation of sign between bank size and bank profitability is subjected to empirical investigation. The following hypothesis is formulated accordingly.

Ho6.There is no significant relationship between bank size and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

3.4.2.2   Banking Industry Specific Factor

In addition to internal factors, banks profitability can be affected by sector specific factors.

Market share: Market share of individual banks may be changes as a result of competitive behavior in industry and economic stability of the country (Staikouras and Wood, 2000). As mentioned by Guru et al.(2002)[6], the deposit is equitable measure of market share in banking than total asset due to asset includes investment in securities and in subsidiaries. In addition, in Ethiopian commercial banking industry, market share in industry is measured by both number of branches and Total deposit (NBE, 2014). Therefore, this study used the ratio of deposit to total deposit in private commercial banks (NBE).   According to Jambere (2014) number of branch or market share is positively correlated with bank's deposit. Hence, deposit and bank profitability has positive significant relationship as aforementioned by researcher. Positive sign of market share indicates banks are paying lower rate on deposit and charging higher interest rate on loan that results the spread. When banks are highly competitive, they charge low interest rate on loan and pays higher interest rate on deposit which decrease profit negatively (Rao, 2012). Hence, student researcher framed the following hypothesis.

Ho7.There is no significant relationship between market share and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

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[6] Total d deposit at each bank as percentage of all banks' total deposit

3.4.2.3 Macroeconomic Factors

Macroeconomic factors are external factors beyond the control of bank's management decision. Rather it needs modify or adjust internal policies to minimize the effects. As aforementioned, these determinants are real GDP and inflation rate of the country.

Economic Growth: Economic growth is measured by Real GDP of the country. Economic growth can boost bank profitability through increasing bank cash flows and increasing demand of borrowing. Then, banks get interest income on granted loan and the default of loan or non-performing loan decreases with in line to economic growth adding interest income from loan and advances. As findings of previous studies (Heffernan and Fu, 2010; Pasiouras and Kosmidou, 2007 and Kosmidou et al.2006) found that real GDP positively affect bank profitability. Hence, the following hypothesis is formulated.

Ho8. There is no significant relationship between GDP and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Inflation: Inflation is one of macroeconomic determinants that affects both cost and revenues of banks. In regards to this, Ponce (2012) introduced that the effect of inflation on bank profitability depends on how inflation affects salaries and other operating costs of bank. Perry (1992) suggested that the effect of inflation on bank profitability depended on whether inflation is anticipated or unanticipated. When anticipated, interest rate is adjusted accordingly determining that interest margin. Therefore, revenue increases faster than cost and hence has positive impact on bank profitability. When inflation rate is unanticipated, it makes operating cost and other labor price increase faster than revenues and has negative impact on bank profitability. Von and chan(2009) asserted that inflation sign on bank profitability is not clear. Inflation is one of macroeconomic risk that determines banks interest margin. Hence, hypothesis developed in this regard is:

Ho9. There is no significant relationship between Inflation rate and bank profitability of Ethiopian private commercial banks for the period 2007 to 2014.

Accordingly, the following table summarized the relationship between hypothesized expected sign of explanatory variables (determinants of profitability) and (dependent variables (return on asset).

Table 3.1 Summary of Variables Employed for the Study

Determinants	Notion	Variable Measurement	Expected Sign
Profitability	**ROA**	Net profit after tax/Total Asset	**NA**
Independent Variable			
Capital Adequacy	**CA**	Equity/Total Asset	**+**
Liquidity	**LI**	Liquidity Asset/Total Deposit	**-**
Asset quality	**NPL**	NPL/Total loan	**-**
Operational Efficiency	**OE**	Non-interest expense/Total income	**-**
Income Diversification	**ID**	Non -interest income/Total Asset	**+**
Bank Size	**BS**	Natural logarithm of Total Asset	**+**
Market Share	**MS**	Deposit in each bank to Total deposit in Commercial banks	**+**
Economic Growth	**GDP**	Annual Real GDP (%)	**+**
Inflation Rate	**INF**	Annual inflation rate	**-**

Table of dependent and independent measurement

3.5   Model Specification and Analysis Techniques

To meet the objective, the study used panel data (cross section and time series data). As noted in Baltagi (2005) the advantage of using panel data is that it controls for individual heterogeneity, less co linearity among variables and tracks trends in the data something which simple time

series and cross sectional data cannot provide. In general, the study utilized descriptive statistics and Econometrics tool analysis.

3.5.1 Descriptive Statistics

Descriptive analysis tool like mean, standard deviation, maximum and minimum were used to show general trend of analysis and to identify outliners.

3.5.2 Econometric Analysis Tool

The study used multiple linear regression analysis and correlation method. Selection of estimation tools between fixed effect (FE) and random effect (RE) was based on Hausman test result. Accordingly, Hausman test result is in favor of fixed effect. As result, the study used fixed effect estimation tools. In addition, random effect is appropriate when number of cross section should is larger than number of time series and also sample has to be selected from large population. However, in addition to Hausman test result, in this study number of series data and cross section are both equal N=T=8 and as a result random effect estimation is not appropriate (Gujarati,2004 and Baltagi,2008). The study investigated the relationship between explanatory variables and dependent variable using Correlation method. To run the regression, E-view6 software was used.

3.5.3 Model Specification

As the objective this study is assessing the determinants of profitability, this study is explanatory approach in nature. Miles and Huberman (1994) stated explanatory research clarifies relationship between controlling variables and dependent variables. According to Creswell (2009), variables of quantitative variables should have to be specified for the simplicity of the understanding by readers

To investigate the relationship between determinants and profitability, model was developed similar to empirical studies like Olweny and Shipho(2011),Rao and Lakew(2012),Roman and Danuletiu(2013) and Tesfaye (2014). Therefore, the current study used the following model.

$ROAzt = Ci + β1CAzt + β2LIzt + β3NPLzt + β5OEzt + βIDzt + β6lnBSzt + β7MSzt + β8GDPt + β9INFt + uzt$

Where;

ROAzt= z bank profitability at time t

CA= Capital adequacy of bank z at time t

LI= liquidity of bank z at time t

NPL= non - performing loan of bank z at time t

OEzt= operation Efficiency of bank z at time t

ID = income diversification of bank z at time t

lnBzt= natural logarithm of bank z (Total Asset) at time t

MSzt= market share of bank z at time t

GDP=   real gross domestic product

INFt= inflation rate at time t and ut is disturbance or error term

 Where, C=constant term, β Coefficient of variables from time 2007 to 2014.

3.5.4   Model Assumptions Tests

The following the model, classical linear regression model assumptions were tested to check whether the assumptions violated or not. These assumptions are as follow:

No Multicollinearity: There is no linear relationship between independent variables (Studenmund, 2000 and Field, 2010).

Normality test: Implies disturbance term should be normally distributed or Given the value of X, the mean value of the random disturbance term (ui) is zero

Homoscedatisicty: Given for disturbance term, its variance has to be the same for all observation unless Hetrosecdasiticy.(Gujrati,2004)

No Autocorrelation: Implies the correlation between two disturbance term is zero (Gujarati, 2004). In addition, the study tested stationary of data using Augmented Dick Fuller (ADF)

This chapter deals with analysis of result based on linear regression using E-view6 software. Secondary data collected from each bank was analyzed in descriptive statistics and multiple regressions. Classical regression model assumption tests and results interpreted accordingly thereof. The first section of this chapter presented descriptive statistics followed by classical regression assumption tests and the second part of this chapter concerned with correlation and regression result interpretations. The final section of this chapter presented combined analysis of descriptive, correlations and regression results.

4.1 Descriptive Statistics Interpretation

This part started with descriptive statistics result of dependent variables and explanatory variables obtained from regression. The descriptive statistics included mean, maximum, minimum and standard deviation of both dependent and independent variables as revealed in table 4.1

Table 4.1 Summary of Descriptive Statistics

Variables	Observation	Mean	Maximum	Minimum	Std. Dev.
ROA	64	0.027	0.047	0.001	0.01
CA	64	0.148	0.508	0.09	0.064
LI	64	0.545	1.38	0.067	0.204
NPL	64	0.03	0.109	0.001	0.022
OE	64	0.377	1.97	0.202	0.239
ID	64	0.035	0.063	0.005	0.011
BS	64	8.542	10.004	5.583	0.947
MS	64	0.118	0.303	0.006	0.072
GDP	64	0.101	0.118	0.075	0.014
INF	64	0.187	0.444	0.062	0.133

Source: own computation by E-view

As shown in 4.1 tables, profitability of the banks is measured by after tax return on asset and 64 observations are taken for all variables. On average, banks profitability is .027 per year and with individual variation from the mean by.010. The standard deviation shows that deviation from mean is .010 which is very small. Of sampled banks, maximum ROA is .047 cents for each one birr invested in asset. On the other hand, least profitable banks earn .001 cents for each one birr invested in asset. This indicates that these banks have to optimize utilization of their asset to increase their earning on asset.

Looking into explanatory variables, descriptive statistics revealed some results. Capital adequacy is measured as the ratio of equity to total asset. On average, banks have 14.8% capital adequacy which is greater than 8% minimum limit set by regulatory organ (NBE). The maximum capital adequacy of sampled banks shows 50.8% and the minimum is 9% which is still greater than minimum set by NBE. Whereas, their deviation from the mean is 6.4% which is relatively large relative to ROA deviation among banks. On average, 14.8% implies that capital adequacy or capital structures of Ethiopian Private Banks were strong. Liquidity ratio is measured as liquid asset of bank to its total deposit[7]. On average, sampled banks are holding 54.5% of liquid asset per year. The Maximum liquidity capacity reveals that 138% with the indication of there is one birr and .38 cents for each one birr liabilities in balance sheet. Banks with least liquidity ratio holds 6.7% with deviation of 20.4% from the mean. NBE has put regulation that banks should not have less than 15% liquidity ratio that measured as liquid asset to customer deposit. The implication is that banks with lower liquidity ratio has to improve its liquidity ratio at least to minimum limit set by regulatory organ whereas those with maximum liquidity ratio have to manage their excess liquidity ratio.

Another descriptive result is that asset quality of bank that measured as non-performing loan to total loan granted to customers. On average, banks have 3% nonperforming loan per year. The

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[7] AS NBE (2013) directive customer deposit is banks' liability.

maximum of non-performing loan among sampled banks is 10.9% whereas lower non-performing loan is 0.1%. This indicates that on average banks have non-performing loan less than 5% set by NBE. The deviation of non- performing loan from mean is by 2.2%. Since non-performing loan affects bank profitability, those banks with more than maximum set have to minimize their non-performing loan. Operation efficiency measured as non -interest expense to total income also measures profitability. On average, of one birr total income, .38 cents incurred as operation expense per year. Maximum operation efficiency 1.97 implies that for one birr total income, there is one birr and 0.97 cents non-interest expense. Banks with least non-interest expense have 20.2% operation efficiency. Those banks well controlled their operating expenses incur .20 cents to generate one birr total income whereas for the period 2007 to 2014 those banks failed to control their operating expenses incur one birr and .97 cents to generate one birr income. This implies that there is 0.20 cents of non- interest expense for total income of one birr bank generates per year. The deviation of operation efficiency from mean is by 23.9% across individual banks. The implication is that degree of controlling non-interest expenses across banks for the period of 2007 to 2014 have been varied with 23.9 %. Therefore, banks with high non -interest expense have to minimize their expense for it negatively affects bank profitability. Income diversification of bank is measured as non-interest income to total asset. On average, banks have been diversifying their source of income by 3.5% per year and with 1.1% deviation across individual bank from the mean. Banks that have been well diversifying its income have 6.3% diversification ratios whereas those have been least diversifying have 0.5%.

The mean value of bank size is measured as log of total asset. On average, banks have log of 8.542 bank sizes per year whereas maximum and minimum bank size is 10.004 and 5.583 respectively. The implication is that Ethiopian private commercial banks have 8.5 bank sizes per year for the past eight years. The maximum indicates that large private commercial banks have

10.004 bank size measured by total asset. Whereas, small bank measured was tends to have 5.583 bank sizes. Bank size deviates from the mean by log of 0.947 across individual banks. Relatively, the deviation of large bank from mean and small bank from mean is not as such creating outliners. Because, from below 5.583 was near to 8.5 and from above 10.004 is near to 8.5. Therefore, Ethiopian private commercial banks have size that tends toward mean during the past eight years. Market share of banks measured as total deposit of each bank as percentage of all total deposit. The mean of banks market share per year is 11.8% in terms of deposit and whereas maximum market share for those expanded their market is 30.3%. Least market share indicated that bank with lower deposit shared market by 6%. The deviation implies that market share of banks deviates by 7.2% from mean.

Descriptive statistics also indicated banks macro environments components. The real GDP of Ethiopian for last eight years (2007-2014) on average 10.1% whereas maximum and minimum of GDP for last eight years is 11.8% and 7.5% respectively. The Ethiopian real GDP deviates by 1.4% from 2007 to 2014 which shows stability of economy and the result is more or less agrees with government reports. Another explanatory variables employed in the study is that inflation rate. On average, inflation rate mean is greater than real GDP mean with higher standard deviation indicating Ethiopian inflation rate is not stable. Inflation in Ethiopia is growing faster than economic growth.

4.2 Classical Linear Regression Model Assumption Tests

The results tested by four diagnostic tests of CLRM assumption to ensure whether classical assumptions are fitted or violated accordingly.

Empirical Model Estimation: As formulated in methodology, the model is:

$ROAz_t = C + \beta 1 CAz_t + \beta 2 LIz_t + \beta 3 NPLz_t + \beta 5 OEz_t + \beta IDz_t + \beta 6 lnBSz_t + \beta 1 MSz_t + \beta 2 GDP_t + \beta 3 INF_t + uz_t$

Where;

ROAzt= z bank profitability at time t

CA= Capital adequacy of bank z at time t

LI= liquidity of bank z at time t

NPL= Non performing loan of bank z at time t

OEzt= operation Efficieny of bank z at time t

ID = income diversification of bank z at time t

lnBzt= natural logarithm of bank z (Total Asset) at time t

MSzt= market share of bank z at time t

GDP= real gross domestic product

INFt= inflation rate at time t and ut is disturbance or error term

 Where, C=constant term, β Coefficient of variables from time 2007 to 2014.

4.2.1   Normality Tests

The test for normality means determining whether the data are well modeled by normal distribution or not. The tests of normal distribution may take place either graphical (Histogram or non-graphical: skewness or kurtosis tests for normality. The decision rule behind the skewness/kurtosis tests for normality states that if the p-value of the error term is greater at the chosen level of significance, ie 1%, 5%, 10%, it indicated that the error terms are normally distributed (Gujarati, 2004). Therefore, P value for residual is 0.594 confirmed that it is greater than 5 % significant level of tests and hence, disturbance term is normally distributed as indicted by the following histogram. The values of kurtosis is 2.81 implies it is almost close to 3 confirming that disturbance terms are normally distributed.

Graph 4.1 Graphical Method for Normality Tests

Series: Residuals	
Sample 2007 2014	
Observations 64	
Mean	2.49e-18
Median	-8.15e-05
Maximum	0.008519
Minimum	-0.011276
Std. Dev.	0.004508
Skewness	-0.297026
Kurtosis	2.807254
Jarque-Bera	1.040130
Probability	0.594482
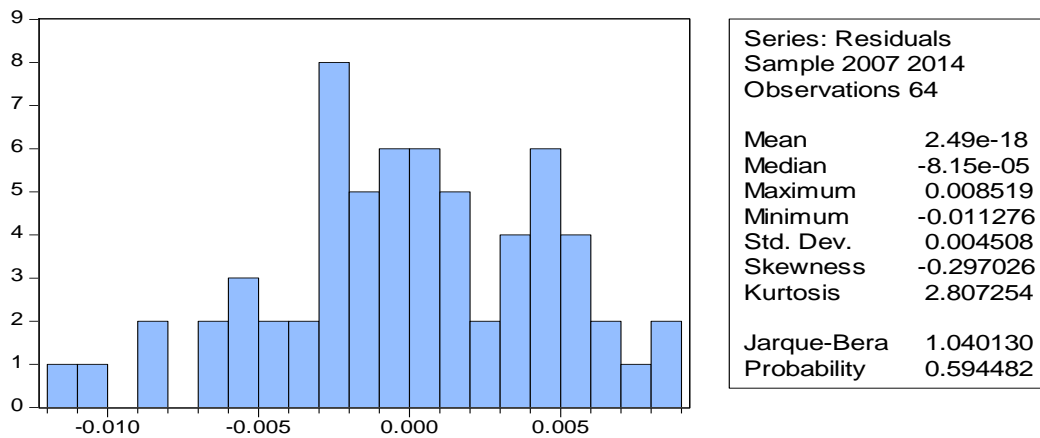
<center>**E-view6 result for Normality tests**</center>

4.2.2   White's Tests for Hetroscedasticity

White test was used for general tests of hetroscedasticity. It tests the null hypothesis that the variance of the error term is homogeneous (there is no Hetroscedasticity problem). To tests the presence of hetroscedasiticity, the residual sum of square for each observation have been calculated and regressed against the independent variables.

The decision rule for the three (F-statistics, Chi-square and scaled Explained SS) is at chosen significance level. If P- value is excess of the significance level, ie 1%,5%, there is no Hetroscedasticity or confirms of Homoscedastcity.

Table 4.2 White's Tests for Hetroscedasticity

F-statistic	2.05458	Prob. F(54,9)	0.10173
Obs*R-squared	61.3474	Prob. Chi-Square(54)	0.2294
Scaled explained SS	39.4651	Prob. Chi-Square(54)	0.9309

Accordingly, as shown in the Table 4.3, F- statistics, Chi-square and scaled explained SS are above 0.05 and hence there is no Hetrosecdasticity

4.2.3 Autocorrelation: Durbin Watson (DW) Tests

The study used 64 observation with 9 repressors and one regresses as panel data (2007-2014 and 8 banks). The assumption is that disturbance terms are independent or not correlated with one another. If errors are correlated with one another, there is autocorrelation (Gujarati, 2004). To check whether autocorrelation exist or not, the study utilized Durbin Watson tests. Due to the fact that autocorrelation is invalid with lag, test excluded time lag. The Durbin Watson tests statistics is 1.67 and Durbin Watson for 9 transgressors with 64 observation shows 1.301dl (lower limit) and 1.923du (upper limit). Accordingly, 1.67 statistics test is found between no decision zones and thus there is no evidence for the existence of autocorrelation. In addition, the tests for normality distribution by histogram evidenced that disturbance term are normally distributed. The decision rule involves the following table. In addition, Brook (2008) states that there is no autocorrelation when Durbin Watson is near to 2 and hence, 1.67 is not as such far from 2.

Table 4.3. Durbin-Watson d Test: Decision Rules

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

Source: Gujarati, 2004

4.2.3.1   **Autocorrelation:** Breusch-Godfrey Serial Correlation LM Test

To further confirm non- existence of autocorrelation, Brook (2008) stated that serial correlation LM test is guarantee when Durbin Watson decision falls in no decision zone. The decision rule is that F- probability and chi-square have to be greater than chosen significant level. Accordingly, Breush Godfrey serial correlation LM test confirmed that there is no first order autocorrelation.

Table 4.4 Autocorrelation Breusch-Godfrey Serial Correlation LMTest

F-statistic	1.091028	Prob. F(7,47)	0.3843
Obs*R-squared	8.945927	Prob. Chi-Square(7)	0.2566

Source: own computation by E-View

4.2.4   Tests for Multicollinearity

Multicollinearity is the indication of linear relationship between independent variables (Kenndey, 2008).

Table 4.5 Pearson Correlation among Explanatory Variables

Variables	CA	LI	NPL	OE	ID	BS	MS	GDP	INF
CA	1								
LI	0.526	1							
NPL	-0.209	-0.078	1						
OE	0.598	0.526	-0.096	1					
ID	-0.376	-0.163	0.071	-0.596	1				
BS	-0.67	-0.562	0.058	-0.659	0.548	1			
MS	-0.583	-0.426	0.107	-0.441	0.215	0.649	1		
GDP	0.113	0.135	0.191	0.18	-0.189	-0.473	0.109	1	
INF	0.06	0.01	0.052	0.044	-0.01	-0.226	0.073	0.466	1

Source: E –view result for Multicollinearity Test

Bryman and Cramer (2001) stated that there is Multicollinearity among explanatory variables when correlation among them exceeds 0.80. Whereas Anderson, Sweeny and William (1990) used 0.70 correlation point as standard point for the indication of Multicollinearity.

As indicated in Pearson correlation table 4.3, the maximum correlation is 0.67 and the lowest correlation is 0.01. Therefore, there is no evidence for the existence of Multicollinearity among explanatory variables

4.2.5   Stationary Test

When data is characterized by constant mean, constant variance and constant auto covariance for a given lag, the data is said to be stationary and if not- stationary over a long period of time the data become a unit root or non-stationary (Brook, 2008). Testing of stationary series is necessary because unit root regression brings spurious regression.

Table 4.6:   Panel unit root test: Summary

Panel unit root test: Summary		
Exogenous variables: Individual effects, individual linear trends		
Tested at lags 1		
VARIABLES	Individual Unit Root -ADF Fisher	Prob.
ROA	-18.1682	0.0000***
CA	37.9011	0.0016***
LI	32.2562	0.0093***
NPL	26.4854	0.0476**
OE	32.9178	0.0076***
ID	59.4558	0.0000***
BS	34.278	0.005***
MS	27.5447	0.0358**
GDP	77.7634	0.0000***
INF	114.932	0.0000***

Null: Unit root (assumes individual unit root)

***,** denotes 1% and 5% significance level

To check whether panel data is stationary or not, unit root was tested by Augmented Dicke-Fuller (ADF) test. The ADF test assumes that if unit root of individual effect at chosen significance level ie 1%. 5%, 10% is less than chi-square probability; the unit root is rejected with evidence (Gujarati, 2004). The study first tested at level unit and failed to reject null hypothesis at for income diversification and market share. Therefore, the study used at first difference test unit with lag one allowing for individual intercept and trends. Accordingly, null hypothesis with assumption of unit root was rejected at 1% and 5% significance level as depicted in the 4.6 table

4.3 Panel Data Model Estimation

The model included panel data that collected from eight banks from 2007 to 2014 from each banks. Panel data tested by one of the three estimators Ordinary least square (OLS), fixed effect and random effect based on their efficiency (Woold, 2008). OLS assumes that regressors are uncorrelated with error and in addition, OLS works to minimize error terms. Accordingly, the assumption of OLS has to be BLUE (best linear unbiased efficient) was failed. The reason is that residual term estimated by OLS is 0.0012 whereas it is 0.0011 when estimated by FE is 0.0011. In addition, Durbin Watson was 1.63 with OLS and 1.67 with FE. Also, model fitness measured by R-square was 0.80 estimated by OLS and 0.82 with FE estimation as depicted in appendix A of this study. As long as OLS was failed to be BLUE, the study continued to estimate either with FE or RE.

Correlated Random Effects - Hausman Test

Table 4.7 Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.064	9	0.041

Source: computed by E-view6

Selection of estimation tools between fixed effect (FE) and random effect (RE) was based on Hausman test result. Accordingly, Hausman test result is in favor of fixed effect as depicted in table 4.7.

Hausman test was applied to select between fixed effect and random effect. Hausman test has asymptotic $\chi2$ distribution. The decision rule is based on probability of Chi2 significance at chosen level, FE is appropriate when significant and RE is appropriate if insignificant (Wooldridge, 2002). The Hausman tests result indicated that Chi2 (9) has probability of 0.041 with chi2 value of 18.064. Hausman test of FE and RE are found at appendix B of this study in detail.

Theoretically, random effect is appropriate when number of cross section is larger than number of time series and sample is selected from large population (Brook,2008). Baltagi (2008, p-17) that states that random effect is appropriate when number of cross section is large relative to number of series taken. In addition, random effect is appropriate when sample is selected from large population. In this panel data, number of cross section and number of year both equal, ie N=T=8 which does not support the use of random effect and in addition, sample is selected from fixed number of population. Therefore, Hausman test confirmed the use of fixed effect instead of RE to estimate panel model regression. In addition, FE estimator is more consistent than OLS regarding variables significance, model fitness and diagnostic tests.

The regression result by FE estimation is depicted in the table 4.6. The dependent variable of the study is ROA measured as profit after tax to total asset of the bank.

As depicted in the table 4.4, capital adequacy, income diversification, market share and real gross domestic have significant and positive relationship with profitability and their respective coefficients are 0.070, 0.651, 0.050, and 0.109 respectively. Thus, they have direct relationship with ROA and their increase leads to increase and as well their decrease leads to decrease profitability. On the other hand, liquidity, non-performing loan, operating efficiency, and

inflation rate are negatively related with profitability and their respective coefficients are 0.004, 0.049, 0.019, and 0.003, respectively. Operating efficiency found as significantly affecting profitability. In addition, bank size with coefficient of 0.002 also positively correlated with ROA. Based on significance level with FE estimation, capital adequacy, operating efficiency, income diversification, market share and real gross domestic are found as determinants of bank profitability and whereas non-performing loan is alerting as determinants of bank profitability at 10% significance level.

Table 4.8 Fixed Effect Regression Result –ROA as dependent Variable

Variables	Coefficient	Std. Error	t-Statistics	prob.
C	0.02726	0.029692	0.918092	0.3632
CA	0.070519	0.032298	2.183385	0.0340**
LI	-0.004941	0.004724	-1.045935	0.2984
NPL	-0.049913	0.028176	-1.771472	0.0904*
OE	-0.019198	0.006617	-2.901314	0.0056***
ID	0.651725	0.111821	5.828288	0.000000***
BS	0.002006	0.002646	-0.758125	0.4521
MS	0.050706	0.020943	2.421143	0.0087***
GDP	0.10954	0.05232	2.093654	0.042**
INF	-0.003416	0.005489	-0.622335	0.5367

R-squared	0.822585		
Adjusted R-square	0.762188	Durbin Watson	1.669214
S.E. of regression	0.004917		
Sum squared residual	0.001137		
F-statistic	13.61969		
Prob(F-statistic)	0.000000		

***. **,* denotes significance at 1%, 5% and 10% respectively.

The overall regression statistics shows that F, 13.619 with probability 0.00000 indicates that capital adequacy, liquidity, non- performing loan, operational efficiency, income diversification, bank size, market share, real gross domestic product and inflation are important factors of bank profitability for private banks in Ethiopia. The coefficients of multiple determinants $(adjusted\ R^2),$ which indicates the quality of model fitness, shows about 76.21% that changes of private bank profitability in Ethiopia is determined by the joint influence of independent variables included in the study. The adjusted $R^2(76.21\%)$ is more powerful than R^2 due to the fact that adjusted R- square penalizes included variables.

4.4   Correlation Result between dependent variable and independent Variables

As indicated in the table 4.5, the correlation between income diversification and ROA is about 0.832 indicating there is high positive correlation between income diversification and ROA.

Table 4.9   Correlation result between dependent and independent Variables

Variables	ROA	CA	LI	NPL	OE	ID	BS	MS	GDP	INF
CA	0.383	1								
LI	-0.192	0.526	1							
NPL	-0.221	-0.209	-0.078	1						
OE	-0.67	0.598	0.526	0.096	1					
ID	0.832	-0.376	-0.163	0.071	-0.596	1				
BS	0.201	-0.67	-0.562	0.058	-0.669	0.548	1			
MS	0.619	-0.583	-0.426	0.107	-0.441	0.215	0.649	1		
GDP	0.348	0.113	0.135	0.191	0.18	0.189	-0.473	0.109	1	
INF	-0.049	0.06	0.01	0.052	0.044	0.01	-0.226	0.073	0.466	1

Source: E-view regression result for variables correlations.

. This implies that when banks diversify their source of income, their profitability increases. Operating efficiency -0.67 correlations with ROA indicated that profitability of the bank and operating efficiency is negatively correlated. The correlation matrix also indicated that market share, capital adequacy, real gross domestic product, and bank size are positively correlated to ROA with correlation value of 0.619, 0.383, 0.348, and 0.201, respectively

On the other hand, bank liquidity, non-performing loan, inflation rate are negatively correlated with ROA with correlation value of -0.192, -0.221, and -0.049 respectively. Inflation rate and bank profitability are negatively correlated.

4.5   Result Analysis

This part concerned with combined analysis of so far interpreted results in descriptive statistics, correlation and regressions. ROA is dependent variable and capital adequacy, liquidity, non-performing loan, operating efficiency, income diversification, bank size, market share, real GDP and inflation rate are as independent variables. The study discussed and analyzed significant determinants of bank profitability and non-performing loan that is going to affect bank profitability as it alerting.

Capital Adequacy (CA)

Capital adequacy is positively correlated with profitability and statistically significant at 5% significance level (P-value=0.034). Sign expected was either positive or negative due to capital adequacy was subjected to empirical finding. As a result, the null hypothesis assumption of there is no significant association between capital adequacy and profitability was rejected with p-value evidence. The correlation of 0.38 between CA and ROA reveals that CA and ROA were significantly correlated and variation in ROA has been explained by capital adequacy of banks for the last eight years (2007-2014). Capital adequacy measured as total equity to total asset with positive sign indicate that as capital adequacy increases, the profitability of the bank increases.

The positive sign of capital adequacy and its positive correlation of Ethiopian private commercial banks from 2007 to 2014 reveal that banks were well capitalized. When banks are well capitalized, they can easily defend against loan loss when loan loss reserve is insufficient to cover loan loss from loan grated to customers. In addition well capitalized bank reduce risk of bankruptcy and lowers cost arise from externally financing. The study is similar with previous Ethiopian studies of Habtamu(2012), Rao and Lakew(2012), Amdemikael(2012) and Semu(2010) and with other country Kosmidiou et al.(2006). According to Berger (1995) positive sign of capital adequacy to profitability indicates that if bank wants to expand to new line of investment, it has the opportunity invest from itself without suffering from external funding finance.

Operating Efficiency (OE)

Operation efficiency is measured as non- interest expense to total income. Empirical study found that operational efficiency is negatively correlated with bank profitability and found statistically significant at 1% significance (P-value=0.0056). Correlation of 0.67 between OE and ROA implies that OE has been determining profitability of Ethiopian private commercial banks for the past eight years. As discussed in descriptive statistics part, higher ratio indicates that inefficiency of cost management whereas lower ratio indicates cost efficiency. Negative coefficient sign in regression result implies that non- interest expense negatively affects profit of the bank as it statistically significant. As a result, the null hypothesis assumption of there is no significant relationship between profitability and operation efficiency is rejected with the support of statistical significance. The implication is that private commercial banks in Ethiopia that have well controlled operation costs reported high profit and whereas those failed to control the cost have reported low profit from 2007 to 2014. In addition, the study is consistent with previous studies of Rao and Lakew(20140), Gure et al.(1999), Jaber and AL-khawaldheh and AL-

khawaldheh (2014) and Maredza (2014). The finding reflected that management and managers of banks should have to minimize operation costs of the bank to increase profitability.

Income Diversification (ID)

Income diversification is measured as non-interest income to total asset. Income diversification is found to be statistically significant at 1% significance level (P-value =0.00000) and positively correlated with bank profitability. This implies that ID has significantly determines variation of ROA. The positive correlation of 0.832 between ID and ROA confirms that private banks in Ethiopia were earning significant revenues from other than interest income for the last eight years. As banks diversifies their source of income, their profitability increase matching with portfolio mix.

Even though the study was effects of determinants, the 65.17 % coefficient of ID has its own implication. The implication is that among explained variables as determinant of bank profitability, the ID impacts ROA by 65.17%. In other words, ID alone has been determining bank profitability almost by 65 % for the past eight years in Ethiopian private commercial banks. The study is consistent with the studies of Sufian and Chong (2008), Flamini et al.(2009), and Amdemikael(2012). Therefore, income diversification has been determining bank profitability of Ethiopian private commercial banks for the past eight years.

Market share (MS)

Market share is measured as total deposit of each bank as to all total deposit of all private commercial banks. The study found that market share was significant at 1% significant level (P-value=0.0087) and positively correlated with ROA. As result, the null hypothesis with no significant relationship between market share and profitability is rejected. In addition, the correlation of 0.62 between MS and ROA implies that variation of ROA is highly explained by MS. The positive sign indicates that banks with high market share earn high profit. The structure support performance hypothesis evidenced that banks in oligopoly market earns positive profit as

a result of their market share. In oligopoly, banks pay low interest rate on deposit collected and charge higher interest rate on loan. Accordingly, bank that has collected large deposit (high market share) earn high profit through lending collected deposit at higher interest rate. Therefore, Ethiopian private commercial banks with high market share have been earning significant revenue from expanded market share for the past eight years. In fact, currently many Ethiopian private banks are aggressively operating number of braches confirms this reality. The study is consistent with the study of Rao and Lakew(2012) and Amdemikael(2012). Therefore, one concludes that market share significantly determines Ethiopian private commercial bank profitability.

Real Gross Domestic Product (GDP)

It is measured as percentage change of gross domestic gross product of Ethiopia. It was positively correlated with ROA and statistically significant at 5% significant level (p-value=0.042). The sign of GDP is positive as expected. As a result, null hypothesis statement with there is no significant relationship between GDP and profitability was rejected with p-value evidence. Its correlation with ROA is about 0.348 indicating the variation of ROA across individual banks is explained by GDP. In addition, the coefficient of GDP 10.95% indicates that GDP has been determining private commercial bank profitability for the past eight years. In other words, GDP impacts bank profitability next to income diversification. The implication is that bank profitability is increasing with substantial growth of country's economic growth. The finding is consistent with studies of Habtamu (2012), Kosmidou et al.(2006), Jaber and AL-khawaldheh and AL-khawaldheh(2014). One can conclude that Ethiopian private commercial profitability has been determined by GDP for the past eight years.

Inflation Rate (INF)

Inflation rate of Ethiopia is negatively associated with Ethiopian private bank profitability. Statistically, it is found to insignificant at 5% significance level (0.53). As a result null,the

hypothesis of there is no significant association between profitability and inflation rate is failed to be rejected statistically. When inflation is anticipated, interest rates are adjusted accordingly and bank's revenues increase faster than cost and hence, inflation rate and profitability are positively correlated. On the other hand, when inflation remained as an unanticipated, the cost of operation increase faster than revenues and inflation rate and bank profitability are negatively correlated. The implication is that Ethiopian private commercial banks' profit abilities have been negatively correlated inflation rate for the past eight years. The study is consistent with the studies of Sufian and Chong (2008), Rao and Lakew(2012).

Non- Performing Loan (NPL)

Asset quality is measured as non-performing loan to total loan. Empirical finding indicated that bank profitability and non-performing loan are negatively correlated as expected. However, it failed to reject at 5% significance level, the null hypothesis with no significant association between bank profitability and asset quality. However, with 10% significance level (p-value=0.09), there is significant relationship between asset quality and bank profitability. The negative sign indicates that non-performing loan is negatively affecting bank profitability. In addition, since non- performing loan has a negative effect on bank profitability, it needs credit risk management and thus why NBE has set limit for NPL to 5%. The study is consistent with previous Ethiopian studies found by Rao and Lakew(2012). On the other hand, Amdemikael found negative relationship and statistically significant relationship between asset quality and bank profitability.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

This part deals with summary, conclusion of the findings and capable recommendation in line to the findings.

5.1   Summary

The study was conducted on determinants of bank profitability in case of Ethiopian private commercial banks. It is well known that economic growth within a country is dependent on the essential intermediary role of the banking sector. Achieving reasonable profit is challenging for banking sector. What challenges bank profitability are bank internal factors like capital adequacy, liquidity, asset quality, operation efficiency, income diversification and bank size. In addition, industry specific factor like market share and macroeconomic factors like real GDP and inflation rate are also challenges of profit making in private commercial banks in Ethiopia. To determine the effects of these variables on bank profitability, the study used panel data of eight banks from Ethiopian private commercial banks and macroeconomic data. To deal with, the study used balanced data cross section and time series data (eight banks data from 2007-2014). The study analyzed data through both descriptive statistics and econometrics tool with E-view6 software.

For profitability measurement, dependent variable studied was ROA using nine explanatory variables. These independent variables are capital adequacy, liquidity, non-performing loan, operation efficiency, income diversification, bank size, market share, and real GDP and inflation rate. The study was analyzed through both descriptive statistics (mean, std. deviation, maximum and minimum) and econometrics tools. The econometrics analysis was estimated through multiple regressions using of fixed effect estimation.

The study has identified the effects determinants of bank profitability from banks' internal factors, industry specific and external factors. As a result, from banks internal factors in line to previous studies in Ethiopia and other countries, capital adequacy, operation efficiency, income

diversification were found as determinants of bank profitability for private commercial banks in Ethiopia. In addition, non-performing loan of private commercial banks is almost near to influence profitability of the banks. From bank specific, market share was found as determinants bank profitability and from external factors real DGP is found as determinants of bank profitability. Whereas liquidity, bank size and inflation rate have not been determining the bank profitability even though they have association with bank profitability.

5.2   Conclusions

In general, as discussed in analysis, Ethiopian private commercial banks profitability has been determined by internal factors like capital adequacy, operating efficiency, income diversification and by industry specific market share. In addition, the profitability of private commercial banks in Ethiopia has been determined by real gross domestic product of the country. Even though liquidity, bank size and inflation rate were associated to bank profitability, they remained as statistically non-determinants of bank profitability. The exception is that at 10% significant level, non-performing loan matters bank profitability. The finding indicated that ID impacts bank profitability positively by 65.17%. The implication is that income diversification alone determined profitability of private commercial by more than 50%. Since the impact is very big, private commercial banks in Ethiopia have to give due attention to income diversification. In terms of impact on profitability, real GDP of the country was the second one next to income diversification. It has been impacted profitability of private commercial banks almost by 11% during the last eight years. Therefore, since real GDP also impacts profitability, private commercial banks have to consider country's economic policy when they design their target objective

Capital adequacy has been positively influencing bank profitability. It implies that as capital adequacy has been increasing, the bank profitability has been increasing. As reviewed from different emprecial findings, when banks continues to increase their capital adequacy,

profitability also increases. Strong capital adequacy helps banks to defend on asset loss from non-performing loans. Of internal factors, Income diversification has been determinants of bank profitability. The study entails banks who have been continued to diversify their source of income have been reporting high profitability. In addition, it has been highly impacting private bank profitability by 65.17 beta coefficients. In relation to other determinants of bank profitability identified, the impact of income diversification is very huge. Market share has been determining private commercial banks profitability for the past eight years. The amount of deposit banks have been mobilizing has been affecting bank profitability.

From macro level factors, Real GDP has been impacting bank profitability. Real GDP of the Ethiopia increment has been positively impacting Ethiopian private commercial banks profitability. In addition, following the income diversification, Real GDP was also the second one that has been affecting bank profitability by10.95% beta coefficients. Operating efficiency has been negatively influencing private commercial banks profitability for the past eight years. The implication is that high ratio of non-interest expense to total income shows inefficiency. As operation efficiency coefficient increase, bank profitability decrease. The finding indicated that those banks have been controlling non-interest expense have been reporting high profit whereas those failed to control reported low profit. Non-performing loan has been negatively correlated with profitability. Even though, NPL is not determinants at 5% significant level, it is significant at 10% significance level. The implication is if banks failed to manage their credit loan, it is going to determine bank profitability negatively.

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5.3 Recommendations

Based on the findings of the study, the following feasible recommendations were forwarded. Private bank should focus on these key internal determinants of bank profitability. The followings are forwarded recommendations.

❖ Since capital adequacy is positively correlated with bank profitability, banks have to increase their equity. The equity increment can take place through dividend capitalization and retained earnings.

❖ Bank management, finance manager and branch managers should be aware of miscellaneous expenses that increase expense. Since the study found that non- interest expense to total income was highly affecting negatively bank profitability, banks should systematically manage non-interest expenses. When banks purchase fixed asset, potential information like quality in terms of service life, market price, usefulness for intended purpose and other issues that minimize expense have to be considered. In addition, supply expenses, utility expenses and other miscellaneous expenses need the follow up of coordinated staff and managers.

❖ Income diversification measured as non – interest income to total income. The implication was income from other than interest income has been significantly affecting bank profitability. The finding indicted that income diversification mostly impacted bank profitability by 65.17%. With evident from findings, banks have the room for improvement of their profitability by greater than 65% only by working on income diversification. Therefore, banks should focus on income from commissions, service charges and foreign exchange gain and also can invest on other sectors like real state. Real state is currently demanding by residents and investment in real state may increase banks' income diversification.

❖ Market share measured as percentage of each bank total deposit to all private commercial total deposit. Market share is positively affects bank. In reality, even among private banks, those who have high market share (big deposit) are earning high profit. Deposit mobilization can take place

through branch network expansion, door to door service on customer demand; giving customer with flexibility to in and out regarding fixed deposit. In addition, private banks can mobilize deposit through recruiting market officer and cooperating market committee in each branch like the state owned commercial Bank of Ethiopia (CBE). Therefore, private banks should mobilize deposit.

❖ Banks have to go with country's real GDP direction. With the increase of real GDP, banks should have to increase quality of service with updated technology to charge equivalent commission that increase profit. With the increment of Ethiopian real GDP, foreign investors are establishing different manufacturing, hotel, schools, hospitals and other service like audit agency. Since these investors are mostly from emerging countries, they need substantial banking service. Therefore, banks have to give them different financing tool like bankers acceptance, letter of credit, finishing loan, and factoring financing to merchandise. When real GDP increase, people also develop need of quality service motives and with low cost service. Therefore, banks with no and limited ATM machine have to install ATM machines and need to install mobile banking. In such, banks can charge equivalent fee that increase profitability.

5.4 Suggestions for Future Research

The study sought to investigate determinants of profitability in case of Ethiopian private commercial banks. The researcher used only secondary data to know how much historical data have been determining bank profitability. The study did not exhaustively incorporate all variables that affect bank profitability like ownership, human capital efficiency, technology, money supply and interest rate. Coming researcher can incorporate these missed factors in their study.

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APPENDIX A: Ratios Used in the Study

Year	Bank	ROA	CA	LI	NPL	OE	ID	logBS	MS	Real GDP	INF
2007	AIB	0.037	0.126	0.415	0.045	0.202	0.033	8.251	0.156	0.118	0.172
2008	AIB	0.030	0.123	0.539	0.049	0.237	0.036	8.481	0.168	0.112	0.444
2009	AIB	0.022	0.107	0.642	0.058	0.217	0.028	8.872	0.180	0.100	0.085
2010	AIB	0.032	0.106	0.662	0.049	0.263	0.043	9.108	0.162	0.106	0.081
2011	AIB	0.036	0.121	0.523	0.037	0.230	0.048	9.314	0.166	0.114	0.332
2012	AIB	0.033	0.126	0.350	0.027	0.497	0.034	9.482	0.151	0.085	0.241
2013	AIB	0.025	0.116	0.285	0.024	0.334	0.030	9.786	0.164	0.097	0.080
2014	AIB	0.028	0.118	0.336	0.023	0.321	0.032	10.004	0.163	0.075	0.062
2007	DB	0.031	0.090	0.344	0.002	0.276	0.027	8.706	0.279	0.118	0.172
2008	DB	0.031	0.095	0.474	0.004	0.234	0.032	8.951	0.303	0.112	0.444
2009	DB	0.026	0.093	0.593	0.001	0.267	0.033	9.183	0.287	0.100	0.085
2010	DB	0.026	0.091	0.518	0.002	0.256	0.039	9.422	0.269	0.106	0.081
2011	DB	0.031	0.095	0.526	0.003	0.242	0.046	9.593	0.253	0.114	0.332
2012	DB	0.037	0.104	0.411	0.002	0.233	0.047	9.771	0.236	0.085	0.241
2013	DB	0.031	0.104	0.382	0.002	0.273	0.040	9.891	0.207	0.097	0.080
2014	DB	0.042	0.118	0.370	0.060	0.286	0.046	9.997	0.192	0.075	0.062
2007	BOA	0.020	0.119	0.376	0.049	0.420	0.019	8.130	0.156	0.118	0.172
2008	BOA	0.003	0.098	0.415	0.098	0.668	0.022	8.359	0.171	0.112	0.444
2009	BOA	0.018	0.095	0.600	0.109	0.364	0.024	8.608	0.163	0.100	0.085
2010	BOA	0.022	0.093	0.576	0.080	0.310	0.033	8.745	0.136	0.106	0.081
2011	BOA	0.025	0.091	0.477	0.034	0.317	0.035	8.893	0.130	0.114	0.332
2012	BOA	0.026	0.110	0.373	0.026	0.312	0.036	9.017	0.113	0.085	0.241
2013	BOA	0.026	0.109	0.296	0.020	0.295	0.028	9.226	0.111	0.097	0.080
2014	BOA	0.024	0.136	0.320	0.018	0.341	0.025	9.330	0.099	0.075	0.062
2007	WB	0.032	0.116	0.227	0.046	0.406	0.039	8.155	0.157	0.118	0.172
2008	WB	0.034	0.147	0.397	0.063	0.345	0.047	8.325	0.146	0.112	0.444
2009	WB	0.035	0.163	0.821	0.065	0.275	0.047	8.541	0.129	0.100	0.085
2010	WB	0.039	0.183	0.809	0.041	0.289	0.055	8.656	0.101	0.106	0.081
2011	WB	0.040	0.166	0.469	0.045	0.265	0.062	8.995	0.127	0.114	0.332
2012	WB	0.040	0.192	0.719	0.024	0.296	0.044	9.030	0.096	0.085	0.241
2013	WB	0.033	0.176	0.323	0.023	0.336	0.037	9.249	0.099	0.097	0.080
2014	WB	0.028	0.186	0.358	0.017	0.404	0.036	9.353	0.091	0.075	0.062
2007	UB	0.029	0.165	0.451	0.031	0.339	0.032	7.688	0.097	0.118	0.172
2008	UB	0.028	0.144	0.567	0.027	0.388	0.033	8.086	0.120	0.112	0.444
2009	UB	0.020	0.112	0.687	0.032	0.310	0.029	8.445	0.131	0.100	0.085
2010	UB	0.030	0.108	0.693	0.038	0.254	0.044	8.682	0.125	0.106	0.081
2011	UB	0.030	0.117	0.587	0.028	0.248	0.038	8.952	0.130	0.114	0.332
2012	UB	0.034	0.125	0.660	0.024	0.267	0.036	9.081	0.113	0.085	0.241
2013	UB	0.028	0.120	0.607	0.019	0.314	0.031	9.208	0.105	0.097	0.080

2014	UB	0.025	0.133	0.665	0.015	0.385	0.027	9.382	0.102	0.075	0.062
2007	NIB	0.029	0.163	0.370	0.035	0.293	0.023	7.866	0.108	0.118	0.172
2008	NIB	0.031	0.164	0.540	0.039	0.302	0.029	8.203	0.122	0.112	0.444
2009	NIB	0.034	0.172	0.708	0.048	0.315	0.036	8.478	0.119	0.100	0.085
2010	NIB	0.035	0.154	0.622	0.041	0.326	0.049	8.695	0.110	0.106	0.081
2011	NIB	0.035	0.165	0.067	0.043	0.294	0.048	8.870	0.110	0.114	0.332
2012	NIB	0.031	0.185	0.468	0.028	0.287	0.045	9.021	0.098	0.085	0.241
2013	NIB	0.024	0.182	0.316	0.025	0.338	0.031	9.121	0.087	0.097	0.080
2014	NIB	0.022	0.183	0.242	0.021	0.302	0.032	9.282	0.086	0.075	0.062
2007	CBO	0.006	0.307	0.631	0.013	0.786	0.009	6.054	0.014	0.118	0.172
2008	CBO	0.022	0.219	0.672	0.013	0.529	0.017	6.519	0.018	0.112	0.444
2009	CBO	0.002	0.153	0.505	0.014	0.722	0.011	6.930	0.021	0.100	0.085
2010	CBO	0.014	0.107	0.734	0.045	0.506	0.030	7.478	0.029	0.106	0.081
2011	CBO	0.019	0.098	0.705	0.020	0.421	0.039	7.824	0.033	0.114	0.332
2012	CBO	0.028	0.114	0.632	0.015	0.345	0.036	8.208	0.037	0.085	0.241
2013	CBO	0.029	0.107	0.817	0.017	0.379	0.046	8.785	0.048	0.097	0.080
2014	CBO	0.047	0.148	0.494	0.019	0.346	0.063	8.903	0.059	0.075	0.062
2007	LIB	0.001	0.508	1.377	0.014	1.969	0.005	5.583	0.006	0.118	0.172
2008	LIB	0.001	0.298	0.973	0.011	0.762	0.016	6.353	0.014	0.112	0.444
2009	LIB	0.001	0.202	0.629	0.011	0.652	0.017	6.859	0.019	0.100	0.085
2010	LIB	0.030	0.177	0.669	0.016	0.358	0.040	7.218	0.024	0.106	0.081
2011	LIB	0.020	0.195	0.704	0.015	0.369	0.036	7.500	0.022	0.114	0.332
2012	LIB	0.031	0.179	0.798	0.016	0.316	0.042	7.809	0.023	0.085	0.241
2013	LIB	0.038	0.184	0.671	0.013	0.298	0.044	7.987	0.023	0.097	0.080
2014	LIB	0.027	0.174	0.687	0.013	0.401	0.037	8.192	0.029	0.075	0.062

APPENDIX B: White Heteroskedasticity Test:

Heteroskedasticity Test: White

F-statistic	2.054577	Prob. F(54,9)	0.10173
Obs*R-squared	61.34742	Prob. Chi-Square(54)	0.2294
Scaled explained SS	39.46508	Prob. Chi-Square(54)	0.9309

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/03/15   Time: 00:39
Sample: 2007 2014
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.024581	0.006765	-3.633595	0.0055
CA	0.015942	0.005614	2.839611	0.0194
CA^2	-0.000513	0.005195	-0.098821	0.9234
CA*LI	-0.001795	0.001920	-0.935108	0.3741
CA*NPL	-0.010703	0.025433	-0.420833	0.6837
CA*OE	-0.011200	0.004369	-2.563495	0.0305
CA*ID	-0.016999	0.035700	-0.476158	0.6453
CA*BS	-0.000949	0.000564	-1.682227	0.1268
CA*MS	0.003495	0.010681	0.327188	0.7510
CA*GDP	-0.013899	0.014278	-0.973451	0.3558
CA*INF	-0.002191	0.001367	-1.602892	0.1434
LI	0.006851	0.002982	2.297631	0.0472
LI^2	-0.000424	0.000249	-1.704513	0.1225
LI*NPL	-0.006602	0.002607	-2.532379	0.0321
LI*OE	0.000111	0.000602	0.183537	0.8584
LI*ID	0.000139	0.004522	0.030766	0.9761
LI*BS	-0.000620	0.000277	-2.238747	0.0519

LI*MS	0.001247	0.001678	0.742774	0.4766
LI*GDP	-0.004900	0.004140	-1.183777	0.2668
LI*INF	-0.000846	0.000689	-1.228082	0.2506
NPL	-0.005204	0.013806	-0.376909	0.7150
NPL^2	0.024787	0.022179	1.117574	0.2927
NPL*OE	-0.007209	0.006830	-1.055581	0.3187
NPL*ID	0.054902	0.060551	0.906708	0.3882
NPL*BS	-6.21E-05	0.001287	-0.048267	0.9626
NPL*MS	0.015796	0.013166	1.199799	0.2608
NPL*GDP	0.063038	0.037272	1.691315	0.1250
NPL*INF	-0.004125	0.003980	-1.036298	0.3271
OE	0.008402	0.004283	1.961521	0.0814
OE^2	0.001817	0.000784	2.318522	0.0456
OE*ID	0.054315	0.019287	2.816196	0.0202
OE*BS	-0.000989	0.000430	-2.300655	0.0469
OE*MS	0.008942	0.004491	1.991341	0.0776
OE*GDP	-0.023140	0.014013	-1.651319	0.1331
OE*INF	-0.000563	0.000573	-0.983744	0.3509
ID	-0.029840	0.021752	-1.371842	0.2033
ID^2	0.172748	0.052524	3.288918	0.0094
ID*BS	-0.000520	0.002539	-0.204776	0.8423
ID*MS	0.065982	0.028041	2.353072	0.0431
ID*GDP	-0.022162	0.043787	-0.506142	0.6249
ID*INF	-0.010371	0.007647	-1.356342	0.2080
BS	0.003446	0.000986	3.495857	0.0068
BS^2	-9.51E-05	3.71E-05	-2.559085	0.0307
BS*MS	-3.87E-05	0.000702	-0.055142	0.9572
BS*GDP	-0.009933	0.002561	-3.878053	0.0037
BS*INF	0.000193	0.000221	0.873724	0.4050
MS	-0.013351	0.007232	-1.846177	0.0979
MS^2	0.002070	0.004146	0.499309	0.6295
MS*GDP	0.073327	0.021177	3.462519	0.0071
MS*INF	-0.002918	0.001987	-1.468943	0.1759
GDP	0.128005	0.046498	2.752922	0.0224
GDP^2	-0.182508	0.162419	-1.123687	0.2902
GDP*INF	-0.005528	0.019680	-0.280907	0.7851
INF	0.000891	0.002565	0.347172	0.7364
INF^2	-0.000382	0.002173	-0.175913	0.8643

R-squared	0.958553	Mean dependent var		2.00E-05
Adjusted R-squared	0.709874	S.D. dependent var		2.71E-05
S.E. of regression	1.46E-05	Akaike info criterion		-19.67375
Sum squared resid	1.92E-09	Schwarz criterion		-17.81846
Log likelihood	684.5601	Hannan-Quinn criter.		-18.94286
F-statistic	2.054577	Durbin-Watson stat		2.260237
Prob(F-statistic)	0.101732			

APPENDIX C : OLS Result

Dependent Variable: ROA
Method: Panel Least Squares
Total panel (balanced) observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002665	0.019739	0.135019	0.8931
LI	-0.002932	0.004073	-0.719689	0.4748
CA	0.063389	0.018786	3.374338	0.0014
NPL	-0.003915	0.029693	-0.131847	0.8956
OE	-0.019449	0.005315	-3.659344	0.0006
ID	0.548105	0.081971	6.686551	0.0000
BS	0.000610	0.001778	0.343304	0.7327
MS	0.026875	0.015742	1.707175	0.0935
GDP	0.031317	0.072390	-0.432613	0.6670
INF	-0.002024	0.005324	-0.380115	0.7054

R-squared	0.800112	Mean dependent var	0.026942
Adjusted R-squared	0.766797	S.D. dependent var	0.010084
S.E. of regression	0.004870	Akaike info criterion	-7.669041
Sum squared resid	0.001280	Schwarz criterion	-7.331716
Log likelihood	255.4093	Hannan-Quinn criter.	-7.536152
F-statistic	24.01674	Durbin-Watson stat	1.633566
Prob(F-statistic)	0.000000		

APPENDIX D: - Hausman Test

Correlated Random Effects - Hausman Test
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.064	9	0.041

Variable	Fixed	Random	Var(Diff.)	Prob.
CA	0.070519	0.063389	0.000687	0.7857
LI	-0.004941	-0.002932	0.000006	0.6694
NPL	-0.049913	-0.003915	-0.000095	0.4610
OE	-0.019198	-0.019449	0.000015	0.9489
ID	0.651725	0.548105	0.005730	0.1710
BS	0.002006	0.000610	0.000004	0.1804
MS	0.050706	0.026875	0.000189	0.9192
GDP	0.109540	-0.031317	0.002545	0.1320
INF	-0.003416	-0.002024	0.000002	0.2640

APPENDIX E: Random Effect Test

Dependent Variable: ROA
Method: Panel Least Squares
Total panel (balanced) observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002665	0.019739	0.135019	0.8931
LI	-0.002932	0.004073	-0.719689	0.4748
CA	0.063389	0.018786	3.374338	0.0014
NPL	-0.003915	0.029693	-0.131847	0.8956
OE	-0.019449	0.005315	-3.659344	0.0006
ID	0.548105	0.081971	6.686551	0.0000
BS	0.000610	0.001778	0.343304	0.7327
MS	0.026875	0.015742	1.707175	0.0935
GDP	0.031317	0.072390	-0.432613	0.6670
INF	-0.002024	0.005324	-0.380115	0.7054

R-squared	0.800112	Mean dependent var	0.026942
Adjusted R-squared	0.766797	S.D. dependent var	0.010084
S.E. of regression	0.004870	Akaike info criterion	-7.669041
Sum squared resid	0.001280	Schwarz criterion	-7.331716
Log likelihood	255.4093	Hannan-Quinn criter.	-7.536152
F-statistic	24.01674	Durbin-Watson stat	1.633566
Prob(F-statistic)	0.000000		