

**DETERMINANTS OF PROFITABILITY OF PRIMARY PEER  
GROUP OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA**

**A RESEARCH THESIS SUBMITTED TO THE DEPARTMENT OF ACCOUNTING  
AND FINANCE FOR THE PARTIAL FULFILLMENT OF MASTER OF SCIENCE IN  
ACCOUNTING AND FINANCE**

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**ADAMA, ETHIOPIA**

## **Declaration**

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in any other university and that all sources of materials used for the thesis have been dully acknowledged.

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This is to certify that Ato **Andualem Kifle** has carried out his research work on the topic under the title of "**Determinants of profitability of primary peer group private commercial banks in Ethiopia**" under my supervision. This work is original in nature and it is suitable for submission for the award of degree for Master of Science in Accounting and Finance.

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This is to certify that the thesis prepared by Andualem Kifle Kebede, under the title of **"Determinants of Profitability of primary peer group of private commercial banks in Ethiopia."** submitted for the partial fulfillments of the requirements for the Degree of Masters of Science in Accounting and Finance Complies with the rules and regulations of the university and meets the expected standards with respect of originality and quality. Hence all reference materials contained therein have been dully acknowledged.

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# *Abstract*

*The purpose of this study is to investigate the determinants of profitability of primary peer group of private commercial banks in Ethiopia. This study adopted an explanatory approach by using panel data research design from the year 2005 to 2014. Purposive sampling method was used to apply for primary peer group private commercial banks in Ethiopia. Quantitative Secondary financial data collection are analyzed by using multiple linear regressions models for the bank profitability measure i.e.; returns on Asset (ROA). The explanatory variables i.e. capital adequacy, management efficiency, liquidity, asset quality, income diversification, bank size, deposit fund, employees efficiency and productivity, real GDP growth rate, inflation and market concentration has been used to determine the profitability of primary peer group private commercial banks. The findings of the empirical study showed that managerial efficiency, bank size, deposit fund, employees' efficiency and productivity, real GDP and market concentration have significant effect on the determinants of profitability. Whereas, capital adequacy, income diversification, liquidity, asset quality and inflation has no impact on the determinants of profitability of primary peer group private commercial banks in Ethiopia.*

**Keywords: profitability, primary peer group of private commercial banks, ROA**

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### **List of Acronyms III**

|       |                                              |
|-------|----------------------------------------------|
| AIB   | Awash International Bank                     |
| AQ    | Asset Quality                                |
| BoA   | Bank of Abyssinia                            |
| BSZ   | Bank size                                    |
| CAP   | Capital Adequacy                             |
| CBE   | Commercial Bank of Ethiopia                  |
| CLRM  | Classical Linear Regression Model            |
| DFIN  | Income Diversification                       |
| DPF   | Deposit fund                                 |
| EP    | Employees efficiency and productivity        |
| GDP   | Gross Domestic Product                       |
| HHI   | Herfindahl-Hirschman index                   |
| HP    | Hypotheses                                   |
| INF   | Inflation                                    |
| LQ    | Liquidity                                    |
| ME    | Managerial Efficiency                        |
| MKT   | Market Concentrations                        |
| MoFED | Ministry of Finance and Economic Development |
| NBE   | National Bank of Ethiopia                    |
| NIB   | Nib International Bank                       |

|     |                               |
|-----|-------------------------------|
| NIM | Net interest margin.          |
| OLS | Ordinary Least Square         |
| RMP | Relative Market Power         |
| ROA | Return on Asset               |
| ROE | Return on Equity              |
| SCP | Structure-Conduct-Performance |
| SSA | Sub Saharan Africa            |
| UB  | United Bank                   |
| WB  | Wegagen Bank                  |

# **Chapter- one**

## **Introduction**

### **1.1 Background of the study**

Profitability can be defined as the final measure of economic success achieved by a company in relation to the capital invested in it (Renato, S. V. 2010). Profitability performs a dynamic role in determining the business success of a firm. Profitability is the amount of money a firm can bring about with whatever resources the firm has. The eventual goal for any organization is maximizing its profitability. Consequently, firms can reap out the benefits associated with the increased profitability (AloyNiresh. et.al, 2014). Similarly, Yazdanfar (2013) stated that a firm's profitability is generally regarded as an important precondition for long term firm survival and success and also affects its economic growth, employment, innovation and technological change.

Profitability performance evaluation is carried out through two major measures: Financial measures and non-financial measures. (Okwo, I. et al 2013). Hence, the ultimate goal of a business entity is to earn profit in order to make sure the sustainability of the business in prevailing market conditions (Hifza Malik, 2011).

Camelia, B. (2011) study on factors influencing the company's profitability opine that in order one company to run on a long-term performance way, it is needed to develop, implement and maintain the strategies, measures and prepare coherent policies from economic and financial point of view, resulted from a good knowing of internal and external specific conditions in which the firm acts. Companies so as to know their specific internal and external conditions and thereby run on a long term performance way, they shall give valuable consideration of the internal and external determinant factors of their profitability

Besides this Banks are the most important financial intermediaries in the most economies that provide a bundle of different services has formed for profit making. As financial intermediaries, banks play a crucial role in the operation of most economies. The efficiency of financial intermediation can also affect economic growth. Besides, banks insolvencies can result in systemic crisis. Bank performance gets a great deal of attention in the finance literature

considering that banks serve a pivotal role in the economy. The performance of banks is expressed in various terms, such as competition, concentration, efficiency, productivity, and profitability. Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou, Brissimis & Delis, 2005).

Bank profits provide an important source of equity especially if re-invested into the business. This should lead to safe banks, and as such high profits could promote financial stability (Flamini *et al*, 2009).

However, too high profitability is not necessarily good. Garcia-Herrero *et al* (2007) observed that too high profitability could be indicative of market power, especially by large banks. This may hamper financial intermediation because banks exercising strong market power may offer lower returns on deposit but charge high interest rates on loans. Too low profitability, in turn, might discourage private agents (depositors and shareholders) from conducting banking activities thus resulting in banks failing to attract enough capital to operate. Furthermore, this could imply that only poorly capitalized banks intermediate savings with the corresponding costs for sustainable economic growth.

During the last two decades, the banking sector all around the world has experienced major transformations in its environment, resulting in significant impacts on its performance. There by both external and internal factors have been affecting the profitability of banks over time. Identifying the key success factors of commercial banks allows formulating policies for improving the profitability of the banking industry. The determinants of bank profitability have attracted the interest of academic researcher as well as of bank management, financial markets and bank supervisors. The global financial crisis of 2007-2009 also demonstrated the significance of bank profitability both in national and international economies and the need to keep it under surveillance at all times. However, there is general agreement that banks profitability is a function of internal and external factors. The internal determinants refers to the factors originate from bank accounts (balance sheets and/or profit and loss accounts) and therefore could be termed micro or bank specific determinants of profitability (Tobias & Themba, 2011). The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and profitability of banks. (Athanasoglou *et al*. 2006)

stated that the importance of banks is more pronounced in developing countries because financial markets are usually underdeveloped, and banks are typically the only major source of finance for the majority of firms and are usually the main depository of economic savings.

Commercial banks are the most dominant financial institutions in Ethiopia. The private sectors involvement started after Monetary and Banking proclamation No.83/1994. Even in the midst of a challenging environment, all key areas of banking operations; few private commercial banks join the banking industry after the new liberalized proclamations.

In Ethiopia, primary peer group of private commercial banks i.e. Awash International Bank, Dashen Bank, Bank of Abyssinia, United Bank, Nib International Bank and Wegagen Bank play important role as financial intermediaries in the economic growth process, channeling funds from savers to borrowers for investment. As financial intermediaries, those six private commercial banks were formed before any private banks established in Ethiopia after the falling of the Derg regime and play an important role in the operation of an economy. In such away, primary peer group of private commercial banks are key providers of funds and their stability is of paramount importance to the financial system. As such, an understanding of determinants of their profitability and the drivers of bank profitability for that matter is essential and crucial to the stability of the economy.

## **1.2 Statement of the Problem**

Bank performance gets a great deal of attention in the economic literature considering that banks serve a pivotal role in the economy. Moreover, the stream of bank failures experienced in the United States of America during the great depression of the 1940s prompted considerable attention to bank performance. The attention has grown ever since then (Heffernan 2005). As noted in Olweny & Shipo (2011) the global financial crisis of 2007/2008 also demonstrated the importance of bank performance both in national and international economies and the need to keep it under surveillance at all times.

Hence, investigating the factors affecting the profitability performance of the sector is the focus of the study. Therefore, the determinants of profitability have been debated for many years and still unsolved issue in the corporate finance literature and across the world.



For instance empirical study in the world shows analyzing bank profitability in groups of countries, such as Molyneux & Thornton (1992), Demircuc-Kunt and Huizinga (1999, 2001), Abreu & Mendes (2001), Bashir (2000), Hassan and Bashir (2), Athanasoglou, Delis and Stakouras (2006).003

Molyneux & Thornton (1992) were investigating a multi-country setting by examining the determinants of bank profitability for a panel of 18 European countries for the 1986-1989 time periods. It is found that significant positive association between the return on equity and the level of interest rates in each country, bank concentration and government ownership.

Demircuc-Kunt and Huizinga (1999) examine the determinants of bank profit and net interest margins, using a comprehensive set of bank specific characteristics, as well as macroeconomic conditions, taxation, regulations, financial structure and legal indicators for 80 countries, both developed and developing, in the 1988-1995 period. It is found that foreign banks have higher profitability than domestic banks in developing countries, while the opposite holds in developed countries. Nevertheless, their overall results show support for the positive relationship between the capital ratio and financial performance.

Abreu & Mendes (2001), and examines the determinants of bank's interest margins and profitability for some European countries. It is found that well-capitalized banks have lower expected bankruptcy costs and better profitability.

Athanasoglou, Delis & Stakouras (2006) have analyzed the effect of selected set of determinants on banks profitability in the South Eastern European region over 1998-2002 periods. It is found that concentration is positively correlated with bank profitability and inflation has a strong effect on profitability while banks profits are not significantly affected by real GDP per capita fluctuations.

In the other multi-country studies, Bashir (2000), Hassan & Bashir (2003) examine the determinants of Islamic banks' performance. Bashir (2000) reports that higher leverage and large loans to asset ratios. It is found that taxation has negative, macroeconomic setting and stock market development have positive impact on banks profitability. Hassan & Bashir (2003) investigate profitability for a sample of Islamic banks from 21 countries. They show that a higher loan ratio actually impacts profits negatively.

In Ethiopia, empirical studies have been conducted to investigate the determinants of bank profitability state owned as well as determinants of profitability private commercial banks. For instance, empirical study (Habtamu Nigussie, 2012) used variable include capital adequacy, Asset quality, managerial efficiency, liquidity, bank size and GDP .In his research In relation to ROA, managerial efficiency, bank size and level GDP growth rate have significant impact on the profitability of private banks.

Amdemichale(2012) on factor affecting profitability: An empirical study on Ethiopia banking industry used variables include capital ,bank size ,asset quality ,income diversification ,liquidity, operational efficiency, market concentration, GDP and inflation. Among the variables he used capital strength, operational efficiency, income diversification, asset quality and GDP growth has strong statistical significance on profitability.

Semu(2010) assessed the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. It also attempted to examine the possible factors that compel the banks to reduce or restrict lending, covering the period of 2005-2009. The findings of the study showed that net deposit and paid up capital have statistically significant relationship with banks performance measured in terms of ROA. New loan disbursement and liquidity had relationship with banks performance measured in terms of both return on asset and Return on Equity (ROE). However, the relationship was found to be statistically insignificant.

So far the empirical studies in the world used interest rates, bank concentration, government ownership, capital, inflation and GDP their findings of the studies differ significantly due to the variation of the environment and include on the analysis.

Summarizing, the overview of previous research which were conducted in the banking sector in the world including in Ethiopia their conclusion of their research result were inconsistence. Indeed what makes the profit determinants debate exciting is the determinants of profit are dynamic through time to time and differ with the nature of operating of the firm from place to place (Flamini et al., 2009).

Therefore, this study attempts to fill the above mentioned gap using the case of primary peer group private commercial banks in Ethiopia for both the internal and external factors that determine profitability by including additional explanatory variables, i.e. deposit fund,

employees productivity and efficiency and replicating the existing variables i.e. capital adequacy, managerial efficiency, asset quality, liquidity, real GDP, inflation and market concentration.

### **1.3. Objective of the study**

#### **1.3.1 General objective of the Study**

The main objective of the study is to investigate the determinants of profitability in primary peer group of private commercial banks in Ethiopia.

#### **1.3.2 Specific Objectives of the Study**

The specific objectives of the study were as follows:

- ❖ To evaluate the impact of capital adequacy on profitability of primary peer group private commercial banks in Ethiopian.
- ❖ To investigate the relationship between asset quality and profitability of primary peer group private commercial banks in Ethiopian.
- ❖ To examine impact of banks liquidity on profitability of primary peer group private commercial banks in Ethiopian.
- ❖ To check the role of management efficiency on profitability of primary peer group private commercial banks in Ethiopian.
- ❖ To examine the effect of deposit fund on profitability of primary peer group private commercial banks in Ethiopian.
- ❖ To see the effect of income diversification on profitability of primary peer group private commercial banks in Ethiopian.
- ❖ To evaluate, the role of bank size on determinants of profitability of primary peer group private commercial banks in Ethiopian.

- ❖ To check the effects of external variables i.e. real GDP and inflation on profitability of primary peer group private commercial banks in Ethiopia.
- ❖ To examine the effects of employees' efficiency and productivity on profitability of primary peer group Ethiopian private commercial banks.
- ❖ To see the outcome of market concentration on profitability of primary peer group Ethiopian private commercial banks.

#### **1.4. Literature driven hypotheses**

In order to archive the aforementioned specific objectives, the expected outcomes of each variable were proposed based on previous empirical findings and theoretical propositions. The following hypotheses were formulated.

##### **Capital adequacy**

Gavila *et al* (2009) argues that, although capital is expensive in terms of expected return, highly capitalized banks face lower cost of bankruptcy, lower need for external funding especially in emerging economies where external borrowing is difficult. Thus well capitalized banks should be profitable than lowly capitalized banks. Neceur (2003) using a sample of 10 Tunisian banks from 1980 to 2000 and a panel linear regression model, reported a strong positive impact of capitalization to ROA. Sufian and Chong (2008) also reported the same results after examining the impact of capital to the performance of banks in Philippines from 1990 to 2005. The banking sector in Ethiopia provides an interesting case to examine the impact of capital because NBE has set the minimum statutory requirement.

- ❖  $H_0$ : capital adequacy has no significant impact on determinants of profitability in primary peer group private commercial banks in Ethiopia.
- ❖  $H_1$ : capital adequacy has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

## Management efficiency

The relationship between expenditure and profits appears straightforward implying that higher expenses mean lower profits and the opposite, this may not always be the case. The reason is that higher amounts of expenses may be associated with higher volume of banking activities and therefore higher revenues. In relatively uncompetitive markets where banks enjoy market power, costs are passed on to customers; hence there would be a positive correlation between overheads costs and profitability (Flamini *et al*, 2009). Neceur (2003) found a positive and significant impact of overheads costs to profitability indicating that such cost are passed on to depositors and lenders in terms of lower deposits rates/ or higher lending rates.

- ❖ **H<sub>0</sub>**: Management efficiency has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>**: Management efficiency has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

## Income diversification

There is a long history of debates about the benefits and costs of diversification in banking literature. The proponents of activity diversification or product mix argue that diversification provides a stable and less volatile income, economies of scope and scale, and the ability to leverage managerial efficiency across products (Choi and Kotrozo, 2006). Chiorazzo *et al* (2008) noted that as a result of activity diversification, the economies of scale and scope caused through the joint production of financial activities leads to increase in the efficiency of banking organizations. They further argued that product mix reduces total risks because income from non-interest activities is not correlated or at least perfectly correlated with income from fee based activities and as such diversification should stabilize operating income and give rise to a more stable stream of profits (Uzhegova, 2010).

The opposite argument to activity diversification is that it leads to increased agency costs, increased organizational complexity, and the potential for riskier behavior by bank managers. Kotrozo and Choi (2006) mentioned that activity diversification results in more complex organizations which “makes it more difficult for top management to monitor the behavior of the other divisions/branches. They further argued that the benefits of economies of scale/scope exist only to a point. The costs associated with a firm’s increased complexity may overshadow the benefits of diversification. As such, the benefits of diversification and performance would resemble an inverted-U in which there would be an optimal level of diversification beyond which benefits would begin to decline and may ultimately become negative.

- ❖ **H<sub>0</sub>**: Income diversification has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>**: Income diversification has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

## **Liquidity**

(Kamau, 2009). is argued that when banks hold high liquidity, they do so at the opportunity cost of some investment, which could generate high returns. The trade-offs that generally exist between return and liquidity risk are demonstrated by observing that a shift from short term securities to long term securities or loans raises a bank’s return but also increases its liquidity risks and the inverse is true. Thus a high liquidity ratio indicates a less risky and less profitable bank (Hempel et al, 1994). Thus management is faced with the dilemma of liquidity and profitability. Myers and Rajan (1998) emphasized the adverse effect of increased liquidity for financial Institutions stating that, although more liquid assets increase the ability to raise cash on short-notice, they also reduce management’s ability to commit credibly to an investment strategy that protects investors” which, finally, can result in reduction of the firm’s capacity to raise external finance” in some cases (Uzhegova, 2010).

- ❖ **H<sub>0</sub>**: Liquidity has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>**: Liquidity has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Bank size**

The impact of bank size on profitability performance is a controversial issue. Akhavein et al. (1997, as cited in Said & Tumin, 2011) reveals that there is a positive and significant relationship between size and bank profitability. Banchuenvijit (2012) Alkassim, F.2005; Shepherd 1972; Ammar et al. 2003) have made conclusion that there is a negative relationship between bank size total asset and profitability performance Amel, Barnes, Panetta and Salleo (2004) and Athanasoglou et al. (2008) suggested that the effects of the bank size on profitability may be positive up to a certain limit and beyond that point it could be negative due to various factors such as the sample country selected and period of study.

- ❖ **H<sub>0</sub>**: Bank size has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>**: Bank size has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Asset quality**

Regarding asset quality we use two ratios: loans to total assets (LA) and loans under follow-up (net) to total loans (LFA). A loan to total assets ratio is a measure of income source of banks and it is expected to affect profitability positively unless bank takes on unacceptable level of risk. Loans Under follow-up (net) (Loans under follow up - specific provisions) to total loans ratio is one of the important measure of asset quality and reflects changes in the health of bank's loan portfolio that affects performance of bank negatively (Aydogan, 1990). The higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio will be.

- ❖ **H<sub>0</sub>:** Asset quality has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>:** Asset quality has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Deposit fund**

Most studies from the literature agreed that, liability portfolio Management especially deposit liability may influence the profitability of commercial banks positively, among this (Moin, 2008) found. In contrary other researchers conclude that Since, time and savings, deposits represent a relatively higher cost source of funds, the more a commercial bank is committed to time and saving deposit, the higher would be the funding cost and hence the lower the profits (Ommeren, 2011).

- ❖ **H<sub>0</sub>:** Deposit fund has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>:** Deposit fund has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Efficiency and productivity (employees)**

Empirical evidence from Athanasoglou et al. (2005) shows that labor productivity growth has a positive and significant effect on bank profitability. This suggests that higher productivity growth generates income that partly channeled to bank profits. The commercial banks can target high levels of efficiency and productivity growth both by keeping the labor force steady and by increasing overall output. Ramlall (2009) said the higher the efficiency level of a bank, the higher the profits level.



- ❖ **H<sub>0</sub>:** Efficiency and productivity (employees) has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>:** Efficiency and productivity (employees) has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Real GDP**

In a high growth economic environment, banks tend to lend more and allowing banks to charge higher rates for the loans. According to the literature on the economic growth-profitability relation, economic growth is expected to have a positive effect on bank's profitability. In their studies Neely and Wheelock (1997), Demirguc-Kunt and Huizing (1999), Bikker and Hu (2002), Athanasoglou et al. (2008), and Dietrich and Wanzenried (2010) concluded a positive relation, in contrast, Naceur(2003) finds no impact for the economic growth on bank's profitability. Athanasoglou et al. (2006) finds no significant effect for the economic growth measured by the real GDP per capita on bank's profitability.

- ❖ **H<sub>0</sub>:** Real GDP has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>:** Real GDP has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Inflation**

The impact of bank inflation on profitability performance is a controversial issue. Guru et al. (2002), Jiang et al. (2003), Vong and Chan (2006), and Athanasoglou et al. (2008), on their studies, they stressed on the positive relation between inflation and the bank profitability. Perry (1992) finds that the affect of inflation on bank's profitability depends on the accuracy of anticipating the inflation. In contrast, Demirguc-Kunt and Huizinga (1999) find that in developing countries inflation and profitability tend to have negative relation especially when

capital ratio is high, due to the fact that costs tend to increase faster than revenue in inflationary environments. Naceur (2003) finds no effect for the inflation on bank profitability.

- ❖ **H<sub>0</sub>**: Inflation has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>**: Inflation has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **Market concentration**

A positive relationship between bank concentration and profitability was found by Short (1979) in a study which was based on a sample of banks from Canada, Western Europe and Japan. Smirlock (1985) posited that there is no relationship between concentration and profitability but between profitability and market share.

- ❖ **H<sub>0</sub>**: Market concentration has no significant impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.
- ❖ **H<sub>1</sub>**: Market concentration has significant positive/negative impact on determinants of profitability in primary peer group of private commercial banks in Ethiopia.

### **1.5. Significance of the study**

The study has been conducted on the determinant factors that affect the profitability of primary peer group privately owned commercial banks Ethiopia. The findings of this research will have great contribution to banks, debtors, business owners, customers, potential investors, government, and other stake holders. Particularly, the study provides bank managers with understandings of activities that would enhance their banks profitability. In addition, this research contributes to the existing literature on the determinants of profitability for the banking industry in general and privately owned commercial banks in particular.

Lastly the findings of this research can be a way in for future researchers on the topic.

## **1. 6. Scope of the study**

The scope of the study is restricted to internal and external factors affecting the profitability of primary peer group private commercial banks registered by the NBE and that have a ten years financial data i.e., 2005-2014.

The scope of the study includes the six leading private commercial banks in the country in terms of both branch network and market share namely, AIB, DB, BoA, WB, UB and NIB. Those banks it serves the public almost two decades is restricted to both internal independent variables i.e. capital adequacy, managerial efficiency, income diversification, liquidity, Bank size, asset quality, deposit fund, and external variables i.e. real Growth domestic product, market concentration, inflation and efficiency and productivity determinants that determine bank profitability .

## **1.7 Limitations of the study**

The main limitation of the study is that the researcher did not consider qualitative source of data for this research. And it is consider only secondary source of data.

## **1.8. Organization of the Paper**

The paper is organized on five chapters with its structure as follows. Chapter one presents the introduction for the main part of the paper. Chapter Two reviews the most significant theoretical and empirical studies including Ethiopian banking business environment. Chapter three focuses to presents methodology of the study. Chapter four also provide the interpretation and analysis of econometric model outcomes. Chapter five gives conclusion and recommendation with policy implication.

## **CHAPTER -TWO**

### **LITERATURE REVIEW**

Several determinants influence banks operations and banks profitability, recognizing and understanding the underlying concepts and definitions of the banking sector is essential in order to vouch results and analyses. Hence, chapter two serves as background for this study by describing concepts of financial intermediation and determinants that could determine banks profitability. Subsequent chapters will build on concepts and definitions described here. In light of the above, the purpose of this chapter is to review the literatures related to bank profitability and its determinants. The review has three sections. Section 2.1 presents a review of the theoretical aspects related to bank profitability and its determinants. This is followed by the empirical literatures, from global and Ethiopian review of the previous studies conducted in relation to bank profitability and its determinants in section 2.2 and 2.3 The Role of National Bank of Ethiopia Directive on Commercial Banks .

#### **2.1. Theoretical review**

This section reviews the basic theoretical issues related to banks and bank profitability and its determinants. Hence, section 2.1.1 presents the role of banks in the economy. Then, section 2.1.2 Presents the theories related to bank profitability.

##### **2.1.1. Role of banks in the economy**

To start very basic, this paragraph discusses the role of banks in the economy and examines the question why banks exist. At first sight, the answer to this question is very intuitive and simple; banks act as an intermediary between those who are in need for money and those who have excess of money.

Looking more closely to this question there could be a more detailed explanation. Namely, in a perfect capital market of Modigliani-Miller (1958), financial institutions are superfluous (Santos 2001); namely, entities can borrow and save directly through the capital market. In reality, such perfect market does not exist; transaction costs and monitoring costs distort capital markets.

Furthermore, capital markets suffer from the information asymmetry and the agency problem. The agency problem refers to the dissimilar incentives of borrowers and savers, in a broader context it refers to the dissimilar incentives of principles and agents (Jensen & Meckling 1976).

In a case of financial distress, borrowers are limited liable; implying that they have incentives to alter their behavior by taking on more risk than savers are willing to accept. Monitoring the borrowers' behavior is time consuming, complex and expensive for individuals.

In general, in inefficient markets, financial intermediation is beneficial since banks have lower monitoring and transaction costs than individuals, due to economies of scale and scope. Another important aspect of banking is the function of maturity transformation. Banks receive short-term savings from depositors and transform those savings into long-term loans to borrowers. By holding a part of the short-term savings in liquid assets and cash, banks could withstand daily withdrawals from depositors. Banks offer a unique service; lending long term while guaranteeing the liquidity of their liabilities to depositors, which can withdraw their money at any time without a decline in nominal value (Schooner & Talyor 2010 cited in van Ommeren 2011).

Capital markets cannot achieve maturity transformation with the same benefits as banks can. Individual investors face liquidity, price and credit risk, which they cannot diversify to the extent banks can. As savers do not withdraw their deposits at the same time, banks hold only a minor part of the savings in liquid cash. Thus, banks diversify liquidity risks over a large pool of savers. Individual savers can also diversify their investments in terms of credit and price risks but it remains unlikely that they could withdraw the investments at any time without facing liquidity issues.

Nowadays, bank activities are more diverse than ever. In the past decades, competition has increased and new activities have emerged. The traditional form of banking, receiving deposits and extending credits, has become less important. Ever since the complexity of balance sheet has increased, as did balance sheet and risk management (van Greuning & Bratanovic 2009 cited in van Ommeren 2011). Besides the incorporations of liquidity, price and credit risks in banking activities, banks increasingly faces market risks (e.g. interest rate risk and currency risk). One may assume that banks' risk managers properly diversify these risks and closely monitor borrowers' behavior to avoid bank failure or financial distress. Nevertheless, monitoring bank

behavior is required to safeguard the continuity and stability of the banking sector due to moral hazard issues.

### **2.1.2. Theories of bank profitability**

Studies on the performance of banks started in the late 1970s/early 1980s with the application of two industrial organizations models: the Market Power and Efficiency Structure theories (Athanasoglou et al. 2006). The balanced portfolio theory has also added greater insight into the study of bank profitability (Nzongang & Atemnkeng 2006). Thus, each of the aforementioned theories and others related to bank profitability and its determinants are discussed in detail in this Particular section as follows.

#### **The market power theories**

As noted in Tregena (2009) applied in banking the market power hypothesis posits that the performance of bank is influenced by the market structure of the industry. There are two distinct approaches within the market power theory; the Structure-Conduct-Performance (SCP) and the Relative Market Power (RMP) hypotheses.

According to the SCP approach, the level of concentration in the banking market gives rise to potential market power by banks, which may raise their profitability. Banks in more concentrated markets are most likely to make abnormal profits' by their ability to lower deposits rates and to charge higher loan rates as a results of collusive (explicit or tacit) or monopolistic reasons, than firms operating in less concentrated markets, irrespective of their efficiency (Tregenna 2009).

Unlike the SCP, the RMP hypothesis posits that bank profitability is influenced by market share. It assumes that only large banks with differentiated products can influence prices and increase profits. They are able to exercise market Power and earn non-competitive profits (Tregenna 2009).

#### **The efficiency theory**

The efficiency hypothesis, on the other hand posits that banks earn high profits because they are more efficient than others. There are also two distinct approaches within the efficiency; the X-efficiency and Scale-efficiency hypothesis.

According to the X-efficiency approach, more efficient firms are more profitable because of their lower costs. Such firms tend to gain larger market shares, which may manifest in higher levels on market concentration, but without any causal relationship from concentration to profitability (Athanasoglou et al. 2006).

The scale approach emphasizes economies of scale rather than differences in management or production technology. Larger firms can obtain lower unit cost and higher profits through economies of scale. This enables large firms to acquire market shares, which may manifest in higher concentration and then profitability (Athanasoglou et al. 2006).

### **The balanced portfolio theory**

The portfolio theory approach is the most relevant and plays an important role in bank performance studies (Nzongang & Atemnkeng 2006). According to the Portfolio balance model of asset diversification, the optimum holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial assets and the size of the portfolio. It implies portfolio diversification and the desired portfolio composition of commercial banks is results of decisions taken by the bank management.

Further, the ability to obtain maximum profits depends on the feasible set of assets and liabilities determined by the management and the unit costs incurred by the bank for producing each component of assets (Nzongang & Atemnkeng 2006).

## **2.2. Empirical review on determinants of commercial banks profitability**

A number of studies have examined the determinants of banks' profitability in many countries around the world. Most of the studies consider internal factors (i.e., banks' specific) and external Factors (i.e., industry-specific and economic environment) and examine either a particular country or a number of countries.

Many empirical literatures conducted on banks profit determinants belong to developed and developing countries' economies. Mainly focused on the U.S. banking system (e.g. Berger, 1995;

De young and Rice, 2004; Stiroh and Rumble, 2006 etc.) and the banking systems in the western developed countries for instance, European countries (Ommeren, 2011; staikouras and wood, 2004 etc.), south-east Europ (Athanasoglou et al., 2008), Korea (Sufian (2011)) and Greeke ( kasmidou et al., 2007; Athanasoglou et al., 2008; Kasmidou and Zopounidis, 2008 etc.). And in Africa (e.g Mathuva, 2002 in Kenya; Flamini et al., (2009) in SSA countries, Belayneh, 2011 in Ethiopia etc.). Those studies usually expressed bank profitability, as a function of internal and external determinants.

A number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study. The finding of each study depending on the operational environment of their banks, the economic and legal environment and the empirical results vary significantly, since both datasets and environments differ.

The internal determinants originate from bank accounts (balance sheets and/or profit and loss accounts) and therefore could be termed micro or bank-specific determinants of profitability. Internal determinants of bank profitability can defined as those factors that are influence by the banks' management decisions and policy objectives. Management effects are the results of differences in bank management objectives, policies, decisions, and actions reflected in differences in bank operating results, including profitability. Essentially, company-level determinants of bank profitability comprise characteristics of individual bank companies that affect their profitability. Shareholder and managerial decisions and activities can directly influence these characteristics; hence, they also differ from company to company. (Athanasoglou et al., 2006; Kasmidou, 2008 and Sufian, 2011).In this study such internal profitability determinants are includes: capital adequacy, credit risk, deposit liability, the level of liquidity, loan and advance, expense management, efficiency and productivity, bank size and non-interest income. The literature suggests that, the environment in which banks operate influences them, like any firm; from this, the external environment is the common and the uncontrolled one.

The external determinants are variables that not related to bank management but reflect the industry-related and macroeconomic environment that affects the operation and performance of commercial banks. External determinants of bank profitability are concerned with those factors, which are not influence by specific bank's decisions and policies, but by events outside the influence of the bank. Several external determinants are included in the performance



examination of commercial banks profitability: the financial market structure; the economic condition of the country, the legal and political environment all may influence the performance of the banks (Athanasoglou et al, 2006; kasmidou, 2008 and Sufian, 2011).Determinants of bank profitability studies conducted in single country are reviewed in section 2.2.1.This is followed by a review of determinants of bank profitability studies carried out on a panel of countries in section 2.2.2. Finally, related studies conducted in the Ethiopian context are reviewed in section 2.2.3

### **2.2.1. Single country studies**

This section presents all the single country studies reviewed by the researcher chronologically as far as the writers' views have tended to change over time. Berger (1995b) more or less belonged to one of the earliest researches conducted in the area of bank profitability. Berger (1995b) examined the relationship between the return on equity and the equity to asset ratio for a sample of United States banks for the 1983-1992 time periods. Using the granger causality model, he showed that the return on equity and equity to asset ratio tend to be positively related.

Guru et al. (2002) investigated the determinants of bank profitability in Malaysia, using a sample of 17 commercial banks during the 1986 to 1995 period. The profitability determinants were divided into two main categories, namely the internal determinants (liquidity, capital adequacy, and expenses management) and the external determinants (ownership, firm size and economic conditions). Their finding revealed that efficient expenses management was one of the most significant factors explaining high bank profitability. Among the macro indicators a high interest rate ratio was associated with low bank profitability and inflation was found to have a positive effect on bank performance.

Athanasoglou et al. (2008) examined the effect of bank-specific characteristics, industry-specific and macroeconomic determinants of bank profitability for Greek banks that covered the period 1985-2001. Specific attention was given for the testing of SCP hypothesis. The empirical results suggested that capital, labor productivity growth, operating expenses, inflation and cyclical output significantly affect profitability. However, the impact of bank size and ownership cannot be observed. Furthermore, the SCP hypothesis was not verified as the effect of the industry concentration on bank profitability was found insignificant.

Sufian & Chong (2008) examined the determinants of Philippines banks profitability during the period 1990–2005. The empirical findings suggested that all the bank-specific determinant variables had a statistically significant impact on bank profitability. The empirical findings also suggested that size, credit risk, and expense preference behavior are negatively related to banks' profitability, while non-interest income and capitalization had a positive impact. During the period under study, the results suggested that inflation had a negative impact on bank profitability, while the impact of economic growth, money supply, and stock market capitalization had not significantly explained the variations in the profitability of the Philippines banks.

Ben Naceur & Goaid (2008) examined the impact of bank characteristics, financial structure and macro-economic conditions on Tunisian banks' net interest margins and profitability during the period from 1980 to 2000. They suggested that banks which hold a relatively high amount of capital and higher overhead expenses tend to exhibit higher net-interest rate margin and profitability levels, while size was negatively related to bank profitability. During the period under study, they found that stock market development had a positive impact on bank profitability. The empirical findings suggested that private banks were relatively more profitable than their state owned counterparts. The result indicated that macroeconomic conditions had no significant impact on Tunisian banks' profitability.

Garcia-Herrero et al. (2009) analyzed the main determinants of profitability for Chinese banks by employing a panel data set for 87 banks from 1997-2004. They found that better capitalized banks, a relatively larger share of deposits, and more X-efficient banks tend to be more profitable. Hence, a less concentrated banking system as well as lower government intervention increases bank profitability. Furthermore, from the macroeconomic variables included, higher real interest rates on loans and inflation appear to foster profitability while the volatility of interest rates reduces it.

Gul et al. (2011) examined the relationship between bank-specific and macro-economic characteristics over Pakistan bank profitability by using data of top fifteen Pakistani commercial banks over the period 2005-2009. Their paper used the Pooled Ordinary Least Square method to investigate the impact of assets, loans, equity, deposits, economic growth, inflation and market

capitalization on major profitability indicators i.e., return on asset , return on equity, return on capital employed and net interest margin separately. The empirical results have found strong evidence that both internal and external factors have a strong influence on the profitability.

Olweny & Shipho (2011) examined the effects of banking sector factors on the profitability of commercial banks in Kenya. To this end, their study adopted an explanatory approach by using panel data research design. Annual financial statements of 38 Kenyan commercial banks from 2002 to 2008 were obtained from the Central Bank of Kenya and banking survey 2009 for the analysis purpose. The data was analyzed using multiple linear regressions method. The results of the analysis showed that all the bank specific factors had a statistically significant impact on profitability, while none of the market factors had a significant impact.

The determinants of profitability of Korean banking sector is examined by Sufian (2011), in which bank-specific and macroeconomic determinants are evaluated. By employing unbalanced bank level panel data, the period considered is 1992-2003. The empirical results revealed that liquidity level, diversification, credit risk, business cycle, and industry concentration significantly affect banks profitability.

One of the latest studies by Sufian & Noor-Mohamad-Noor (2012) examined the internal and external factors that influenced the performance of banks operating in the Indian banking sector during the period 2000–08. The empirical findings from this study suggested that credit risk, operating expenses, liquidity and size had statistically significant impact on the profitability of Indian banks.

The other very latest study by Ponce (2012) empirically analyzed the factors that determine the profitability of Spanish banks for the period of 1999–2009. Based on the findings of the study the researcher concluded that the high bank profitability during these years is associated with a large percentage of loans in total assets, a high proportion of customer deposits, good efficiency and a low doubtful assets ratio. In addition, as per the findings a higher capital ratios also increased the bank's return, but only when return on assets is used as the profitability measure. The findings also revealed that as no evidence of either economies or diseconomies of scale or scope exist in the Spanish banking sector.

### **2.2.2. Panel country studies**

Molyneux & Thornton (1992) were the first to explore thoroughly the determinants of bank profitability on a set of countries. They used a sample of 18 European countries during the 1986-1989 periods. They found a significant positive association between the return on equity and the level of interest rates in each country, bank concentration and government ownership.

Demirguc-Kunt and Huizinga (1999) examine the determinants of bank profit and net interest margins, using a comprehensive set of bank specific characteristics, as well as macroeconomic conditions, taxation, regulations, financial structure and legal indicators for 80 countries, both developed and developing, in the 1988-1995 period. It is found that foreign banks have higher profitability than domestic banks in developing countries, while the opposite holds in developed countries. Nevertheless, their overall results show support for the positive relationship between the capital ratio and financial performance.

Abreu & Mendes (2002) investigated the determinants of bank's interest margins and profitability for some European countries in the last decade. They reported that well capitalized banks face lower expected bankruptcy costs and this advantage "translate" into better profitability. Although with a negative sign in all regressions, the unemployment rate was relevant in explaining bank profitability. The inflation rate was also relevant.

In the other multi-country studies, Bashir (2000), Hassan and Bashir (2003) examine the determinants of Islamic banks' performance. Bashir (2000) reports that higher leverage and large loans to asset ratios. It is found that taxation has negative, macroeconomic setting and stock market development have positive impact on banks profitability. Hassan and Bashir (2003) investigate profitability for a sample of Islamic banks from 21 countries. They show that a higher loan ratio actually impacts profits negatively.

Athanasoglou et al. (2006) examined the profitability behavior of bank-specific, industry-related, and macroeconomic determinants, using an unbalanced panel dataset of South Eastern European credit institutions over the period 1998-2002. The estimation results indicated that, with the exception of liquidity, all bank-specific determinants significantly affect bank profitability in the anticipated way. A key result is that the effect of concentration was positive, which provides evidence in support of the structure-conduct-performance hypothesis, even though some

ambiguity arises given its interrelationship with the efficient-structure hypothesis. In contrast, a positive relationship between banking reform and profitability was not identified, whilst the picture regarding the macroeconomic determinants is mixed.

Pasiouras & Kosmidou (2007) measured the effects of 10 internal and external variables on profitability, including the capital ratio, cost to income ratio, loans to customers and short-term funding, bank size, inflation, GDP growth, concentration, and three determinants reflecting the development of banking and stock markets on bank returns for 584 domestic and foreign commercial banks in the 15 developed European Union countries over the period 1995-2001. The effects of all variables are found to be significant, regardless of bank ownership status except for the concentration ratio.

Using a sample of 389 banks on an unbalanced panel of 41 SSA countries over the period 1998-2006, Flamini et al. (2009) studied the determinants of bank profitability. The paper proposed that higher returns on assets are associated with larger bank size, activity diversification, and private ownership. Bank returns are affected by macroeconomic variables, which indicate that macroeconomic policies that promote low inflation and stable output growth promote the expansion of credit. The results also indicated moderate persistence in profitability. Causation in the Granger sense from returns on assets to capital occurs with a considerable lag, which means that it does not maintain high returns immediately in the form of capital increases. Thus, the paper gave some support to the policy of imposing higher capital requirements in the region to promote financial stability.

Ben Naceur & Omran (2011) analyzed the influence of bank regulations, concentration, and financial and institutional development on the Middle East and North Africa countries' commercial banks' margins and profitability during the period 1989 -2005. They found that bank specific characteristics, in particular bank capitalization and credit risk, had a positive and significant impact on banks' net interest margins, cost efficiency, and profitability. On the other hand, macroeconomic and financial development indicators had no significant impact on bank performance.

More recently; Said & Tumin (2011) examined performance and financial ratios of commercial banks in Malaysia and China. The purpose was to investigate the impact of bank-specific factors

which include liquidity, credit, capital, operating expenses and the size of commercial banks on their performance, which is measured by return on average assets and return on average equity. The results imply that ratios employed in the study have different effects on the performance of banks in both countries, except credit and capital ratios. Operating ratios influence performance of banks in China, but this influence was not true for Malaysian banks regardless of the measure of performance.

### **2.2.3 Review of previous studies on Ethiopia**

In the context of Ethiopia, to the knowledge of the researcher, there appears to be very limited Empirical studies have done on the assessment of determinants of profitability of banks. These studies include the recent studies of Semu (2010) and Damena (2011) etc. Those studies examined the impact of reducing loan by Ethiopian banks on their own performance and the determinants of commercial banks profitability in Ethiopia respectively. Thus, this particular section provides a detailed review of the three related studies conducted in the context of determinants of banks profitability in Ethiopia.

A study made by Semu (2010) assessed the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. It also attempted to examine the possible factors that compel the banks to reduce or restrict lending, covering the period of 2005-2009. Quantitative method particularly survey design approach was adopted for the study. The findings of the study showed that net deposit and paid up capital have statistically significant relationship with banks “performance measured in terms of return on equity. New loan disbursement and liquidity had relationship with banks performance measured in terms of both return on asset and Return on Equity (ROE). However, the relationship was found to be statistically insignificant. Net deposit and paid up capital had no statistically significant relationship with banks” performance in terms of Return on Asset (ROA).

### **2.3. The Role of National Bank of Ethiopia Directive on Commercial Banks**

The commercial banks in Ethiopia operating under highly regulated business environment. This rule and regulations are stated by the national bank of Ethiopia. The NBE directives have its own Positive and negative role on profitability particularly private owned commercial banks. This might be hindering the development of the bank. For instance, among the NBE directives some of which related with this study are stated here: Licensing and Supervision of Banking Business

directive No. SBB/29/2002(see,<http://www.nbe.gov.et>) under article 4 stated single borrower loan limit like this: “the aggregate loan or extension of credit by a bank to any one borrower, whether a natural person or business organization, shall at no time exceed 25% of the total capital of the bank’. Even if, this directive has the advantage to reducing the non-performing loan, it affecting the loan performance of private commercial banks. So the NBE can set other mechanisms to protecting nonperforming loan, rather than limited the borrowing capacity of the borrower. Because according to Flamini et al. (2009) conclusion, the main source of credit risk are; poor enforcement of creditor rights and obligation, weak legal environment, and insufficient information about the borrowers but giving much loan may not the source of the credit problem.

In addition to this, economic growth adds to risk as it promotes the deterioration of credit quality, and increases the probability of loan defaults. Other important directives which related to the determinants of profitability are Licensing and Supervision of Banking Business Minimum Capital Requirement for Banks Directives No. SBB/50/2011. This directive under article 4 of these directives stated the Minimum Paid-up Capital of the banks like this:

*The minimum paid up capital required to obtain a banking business license shall be Birr 500 Million (birr five hundred million), which shall be fully paid in cash and deposited in a bank in the name and to the account of the bank under establishment.*

Even though, the directive protect the private commercial banks by increase the stability of a national banking system and by decreasing the likelihood of a bank failure and a number of negative externalities exist in banking that cause risk to systematically under price. It affected the profitability of the private commercial banks by reducing the return which generate from the capital by the banks. Because my researchers believe capital is the main source of income for commercial banks provided as loan (Athanasoglo *et al.*, 2005). In addition to this, the directive sets; the bank which is fails to comply with the minimum paid up capital requirements must prohibit such bank from accepting new deposits, underwriting new loans and conducting international banking business until the deficiency in capital is corrected .

Moreover, this directive affect the profitability of the private commercial banking of Ethiopia.NBE set as a directive about risk weighted asset calculation under Licensing and Supervision of Banking Business Directive No. SBB/9/95 Computation of Risk Weighted Asset.

According to the directive, the manner of computation of Risk weighted assets and percentage weight attached to each asset shall be calculated in the manner as shown in the described here. Directives No. SBB/50/2011, under article 4 of these directives stated, all licensed banks shall at a minimum maintain capital to risk weighted assets ratio of 8% at all times. This is also the same with Basel I rule.



## **Chapter -Three**

### **Methodology**

#### **3.1 RESEARCH DESIGN**

Research design is a plan and procedure for a research that cover the decisions from broad assumptions to detailed methods of data collection and analysis. It is a design and specific method (data collection, analysis and interpretation) that should be used to study a specific top problem, researcher's personal experience and the audiences for the study (Jhon, 2009).

This study adopted an explanatory research design and panel data to see the causal relationship between dependent and independent variables. The advantage of using panel data is that it controls for individual heterogeneity, less co linearity variables and tracks trends in the data something which simple time-series and cross-sectional data cannot provide (Baltagi, 2005).

#### **3.2 Target population**

The target population of this study was all private commercial banks who are termed as primary peer group. These are; Awash international bank, Dashen Bank, Abyssinia Bank, United Bank, Wegagen Bank and Nib International Bank.

#### **3.3 Data source and type**

The source of data for this research was secondary sources .The secondary data is collected from internal and external sources. The internal sources are from balance sheet and income statement of the six private commercial banks which are established for about two decades. The external sources are from National Bank of Ethiopia (NBE), which regulates the banking sector of the country, Ministry of Finance and Economic Development which regulates the macroeconomic issues of the country annual reports. The financial data for the bank-specific variables collected from the audited financial statements (i.e. balance sheet and income statement) of the annual reports of each bank and from the National Bank of Ethiopia (NBE) general annual reports. The

balance sheet and income statement were obtained from the annually reported financial data during the period 2005 – 2014.

### **3.4 Sample design**

This study has applied purposive sampling design to select the six leading private commercial banks in Ethiopia. These banks are registered by National Bank of Ethiopia as primary peer groups for they are under operation in the country for about two decades. The total population of private commercial banks working in Ethiopia is sixteen .Out of the sixteen private commercial banks the six leading private commercial banks are; Awash international bank, Dashen bank, Abyssinia bank, Wegagen bank, united bank, Nib international bank. The researcher conducted his research on the selected six leading private commercial banks, because, these banks are working in the financial sector of Ethiopia for about 20 years. The reason behind purposively selected is that, banks that stayed long in the industry can't be compared with the newly established banks. The other reason to depend only on the above mentioned six private commercial banks is that, the remaining private commercial banks joined the industry five years after the formation of primary peer group private commercial banks.

### **3.5 Data analysis techniques**

Descriptive statistics and regression analysis were used to analyze collected data. Descriptive analysis used to describe relevant aspects of observable facts about the variable and provide detailed information about each relevant variable. The collected data analyzed by using descriptive statistics, correlations, and multiple linear regression analysis. The analyzed date was used by statically software known as E-views 6 software package and the outputs generated were presented by different tools like figures and tables.

### **3.6. Description of variables**

In order to examine the determinants of profitability of primary peer group private commercial banks in Ethiopia, the study employed twelve variables. These are one dependent variable and eleven independent.

#### **Dependent Variable**

In the literature, banks profitability, typically measured by return on asset (ROA), return on equity (ROE), net interest margin (NIM). NIM reflects the difference between interest income and interest expense as a percentage of total assets. ROA reflects the ability of bank's management to generate profits from the bank's assets, although it may be biased due to off-balance-sheet activities. ROE shows the return to the shareholders on their equity. As highlighted by Athanasoglou et al. (2008) and Sufian (2011), many scholars suggest that ROA is the key ratio for the evaluation of bank profitability given that ROA is not distorted by high equity multipliers, while ROE disregards the risks associated with high leverage and financial leverage. In this respect, researcher rarely find the paper utilizes ROE as a single measure of profitability.

Rumler & Waschiczek (2010) is one of the examples. Other papers utilize ROE for checking the consistency with ROA, e.g. Ben Naceur & Omran (2011) and Sufian (2011). While a bulk of studies employed ROA as profitability measure, e.g. Pasiouras & Kosmidou (2007), Athanasoglou et al. (2008) and Olweny & Shipho (2011). Therefore, this study attempts to measure profitability by using ROA similar to most of the aforementioned researchers. ROA is measured as net profit before tax divided by total assets similar to Olweny & Shipho (2011).

#### **Independent Variables description and measurement**

The determinants of profitability of primary peer group private commercial banks in Ethiopia are affected by factors emanated from internal environment and external environment. The independent variables used in the study are classified as eight internal and three external factors. The internal variables used in this study were capital adequacy, asset quality, liquidity, managerial efficacy, deposit fund, income diversification, bank size, employees' efficiency and

productivity. The external variables were also real GDP, inflation and market concentration.

**Capital Adequacy:** The ratio of equity to total assets (CA) is considered one of the basic ratios for capital strength. It is expected that the higher this ratio, the lower the need for external funding and the higher the profitability of the bank. It shows the ability of bank to absorb losses and handle risk exposure with shareholder. Equity to total assets ratio is expected to have positive relation with performance that well-capitalized banks face lower costs of going bankrupt which reduces their costs of funding and risks (Berger, 1995; Bourke, 1989; Hassan & Bashir, 2003).

**Asset quality:** Regarding asset quality we use two ratios: loans to total assets (LA) and loans under follow-up (net) to total loans (LFA). A loan to total assets ratio is a measure of income source of banks and it is expected to affect profitability positively unless bank takes on unacceptable level of risk. Loans Under follow-up (net) (Loans under follow up - specific provisions) to total loans ratio is one of the important measure of asset quality and reflects changes in the health of bank's loan portfolio that affects performance of bank negatively (Aydogan, 1990). The higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio will be.

**Liquidity:** The ratio of liquid assets to total assets is used in this study as a measure of liquidity. The higher this percentage the more liquid the bank is. Insufficient liquidity is one of the major reasons of bank failures. However, holding liquid assets has an opportunity cost of higher returns. Bourke (1989) finds a positive significant link between bank liquidity and profitability. However, in times of instability banks may choose to increase their cash holding to mitigate risk. Unlike Bourke (1989), Molyneux & Thornton (1992) come to a conclusion that there is a negative correlation between liquidity and profitability levels.

**Management efficiency:** The total cost of a bank (net of interest payments) can be separated into operating cost and other expenses (including taxes, depreciation etc.). From the above, only operating expenses can be viewed as the outcome of bank management. The ratio of these expenses to total assets is expected to be negatively related to profitability, since improved management of these expenses will increase efficiency and therefore raise profits. This expected

negative correlation applies in particular to the Greek case, where personnel expenses are affected by relatively low productivity and the excess capacity of the larger publicly-owned banks.

**Bank size:** In most finance literature, total assets of the banks are used as a proxy for bank size. Bank size is represented by natural logarithm of total asset ( $\log A$ ). The effect of bank size on profitability is generally expected to be positive (Smirlock, 1985). There is consensus in academic literature that economies of scale and synergies arise up to a certain level of size. Beyond that level, financial organizations become too complex to manage and diseconomies of scale arise. The effect of size could therefore be nonlinear; meaning that profitability is likely to increase up to a certain level by achieving economies of scale and decline from a certain level in which banks become too complex and bureaucratic. Hence, the expected sign of the coefficient of bank size is unpredictable based on academic literature. This analysis uses the logarithm of total asset to capture the potential non-linear effect of size similar to Athanasoglou et al. (2008) and Sastrosuwito & Suzuki (2011).

**Income Diversification:** Financial institutions in recent years have increasingly been generating income from “off-balance sheet” business and fee income. Albertazzi & Gambacorta (2006) as cited by Uzhegova (2010) noted that the decline in interest margins, has forced banks to explore alternative sources of revenues, leading to diversification into trading activities, other services and non-traditional financial operations.

The concept of revenue diversifications follows the concept of portfolio theory which states that banks can reduce firm-specific risk by diversifying their portfolios. Moreover, the decline in interest margins during the last decade has changed the traditional role of banks and forced them to search for new sources of revenue. In this context, using annual bank level data of all Philippines commercial banks Sufian & Chong (2008) found a positive relationship between the ratio of total non-interest income to total assets, a proxy for income diversification and bank profitability. Following, the study of Sufian & Chong (2008) the ratio of non-interest income to total assets is entered in the regression analysis as a proxy for income diversification in the current study. The variable is expected to exhibit a positive relationship with bank profitability which is in line with balanced portfolio theory. In this study, the income which generate from the non interest sources will measured by non-interest income to total income ratio.

The importance of fee-based services of commercial banks is to increase the non-interest income. As the result activity of fee-based services and their product diversification is captured by non-interest income to total income ratio. Although, In the case of commercial banks the majority income generate from interest income, commercial banks profitability highly affected by interest fluctuation and loan default risk. But Banks those incomes are highly depend on non-interest income can protect the profit from decline during this situation. Since, this income never affected by interest fluctuation and loan default risk. In the banking industry of Ethiopia as check by (Belayneh, 2011) there is a positive relation between non-interest income and profitability.

**Deposits fund:** The amounts of interest income Commercial banks earn mainly depend on the amount and quality of the fund deposited with them by the public. There are three major sources of deposit funds for the commercial banks; namely: current or demand deposits, fixed or time deposits / term deposits and Savings deposits. On current or demand deposits, the bank no pays practically interest. The depositor can be withdrawn in part or in full at any time by issuing cheque. Fixed / Time / Term deposits are so- called for commercial banks because they are left with the bank for a certain fixed period before the expiry of which they cannot be withdrawn except after giving due notice. On such deposits, the bank pays higher interest. Savings deposits can withdraw any time subject to certain limitations regarding the amount withdrawn or the frequency of withdrawals. In fact, only a small percentage of savings are withdraw at any particular time. Since, withdrawals can and do take place, the commercial bank has to keep a certain proportion of its assets in liquid form Rasiah (2010).

As we know the primary function of the commercial banks are collecting deposits and giving loan to the public from this deposits. The competitiveness and the profitability of the bank are depending profits. Commercial banks compete for deposits in order to become larger and thus to be able to supply more funds to the public. On the degree of well performing of this activity. About this, Rasiah (2010) stated like:

*Commercial banks, accepts cash and hold on to as much of it as possible because the more it has and can retain the more funds it can lend to the public. That is, the more cash a commercial bank has the greater is its capacity to make profits. Moreover, the commercial bank always utilizes its funds to the full in lending funds; the greater is the commercial banks' profitability.*

*Hence, the competition for deposits is really a competition for However, such financial growth is profitable only if the commercial bank does not incur additional expenses to obtain and retain cash.*

Most studies from the literature agreed that, liability portfolio Management especially deposit liability may influence the profitability of commercial banks positively, among this (Moin, 2008) found.

In contrary other researchers conclude that Since, time and savings, deposits represent a relatively higher cost source of funds, the more a commercial bank is committed to time and saving deposit, the higher would be the funding cost and hence the lower the profits (Ommeren, 2011).

In the case of Ethiopian commercial banks business environment regarding the impact of deposits on profitability research conducted by (Belayeneh, 2011) concluded that, even though, deposit is the main source of funds for banks, the number one expense item for a banking sector is interest payment on saving and fixed deposits. Because of this, study revealed fixed deposit has a negative and significant impact on Ethiopian commercial banks profitability. In addition to this, the result shows that the impact of saving deposit on banks profitability is unstable and insignificant.

**Annual real GDP growth rate:** It is a measure of the total economic activity and it is adjusted for inflation. It is expected to have an impact on numerous factors related to the demand and supply for banks deposits and loans. According to the literature on the association between economic growth and financial sector profitability, GDP growth is expected to have a positive relation on bank profitability (Demirguc-Kunt & Huizinga, 1999; Bikker & Hu, 2002). In this context, we expected a positive relationship between bank profitability and GDP development as the demand for lending is increasing (decreasing).

**Annual inflation rate:** This measures the overall percentage increase in Consumer Price Index (CPI) for all goods and services. Inflation affects the real value of costs and revenues. The relationship between the inflation and profitability may have a positive or negative effect on profitability depending on whether it is anticipated or unanticipated (Perry, 1992). If an inflation rate is anticipated, banks can adjust interest rate in order to increase revenues than costs. On the

contrary, if inflation rate is not anticipated, banks cannot make proper adjustments of interest rate that costs may increase faster than revenues. But most studies observe a positive impact between inflation and profitability (Bourke, 1989; Molyneux & Thornton 1992; Hassan & Bashir 2003; Kosmidou, 2006).

**Market concentration:** The previous researcher like Ommeren (2011) and Athanasoglou et al. (2005) measured concentration using the Herfindahl-Hirschman (H-H) index. In this study also measured market concentration like the previous researcher by using the Herfindahl-Hirschman (H-H) index, which is the sum of the squares of market share of the sample banks included in this particular study. Market share of each bank is measured by the ratio of a bank's total asset to total asset of all banks. It is the number, size, and distribution of banks in a particular market or country. An HH-index of 10,000 indicates that there is only one bank in the country while if the number of banks goes to infinite the HH-index will return almost to zero Athanasoglou et al. (2005)

The high concentration ratio in the market creates greater than average efficiency in these markets yielding a positive profit concentration relationship (Berger et al., 1989). They pointed out four sources of anti-competitive behaviors may be arisen as a consequence of high market concentration: first, if a firm is enjoying a large share of market and it is able to set the prices in excess of competitive levels with a lesser pressure on managers for maintaining operation costs at or near their competitive level. Second Managers' self-interest behavior may lead to making more risky financing decisions (which are above the shareholders' expectation) to reduce the variation in earnings to protect their positions. Third increase in the political cost associated with obtaining and depending on the existing market power. And the fourth the retention of inefficient managers or the maintenance of inefficient practices allowing managers to live a quiet life to pursue other objectives or maintain market power gains.

A positive relationship between bank concentration and profitability was found by Short (1979) in a study which was based on a sample of banks from Canada, Western Europe and Japan. However, some contemporary studies have challenged the acceptability of the positive relationship predicted between market concentration and profitability. Smirlock (1985) posited that there is no relationship between concentration and profitability but between profitability and market share. His study, which used 2,700 unit-banks in state, found no evidence for the



relationship between concentration and profitability. However, he found strong evidence for the relationship between market shares (which are used as proxy for the firm's profitability). He showed that market concentration is not a signal of collusive behavior but rather the superior efficiency of the leading firms.

The SCP hypotheses have been applied in different research by various researchers and supported positive relationship between market concentration (measured by concentration ratio) and performance (measured by profits) exists. Furthermore, SCP recognized the competitiveness of small market share banks with large market share is weak as a result the positive relationship between market concentration and performance (profitability) of high market share banks exist (Berger and Hannan, 1989 and Goddard et al., 2004). In Ethiopia banking business environment study conducted by (Belayneh, 2011) indicated that the existence of negative and significant relationship between the declining market concentration and Ethiopian commercial banks profitability.

**Efficiency and Productivity(employees):** In the literature on bank performance, the single ratios such as net interest income over total assets, operating expense to operating income, operating expense to total assets and gross income to the numbers of employees had been used to assess manager's and employee's efficiency in banks. Especially the last ratio is almost the best measurement of employee's efficiency and productivity. The former considers the proportion of every birr of income spent on the average by a bank as a measure of the efficiency of the bank's management. The higher this ratio indicates better managerial efficiency of the bank. The latter ratio relates the expenditure of the bank (as an input) to its asset base (as a measure of its output).

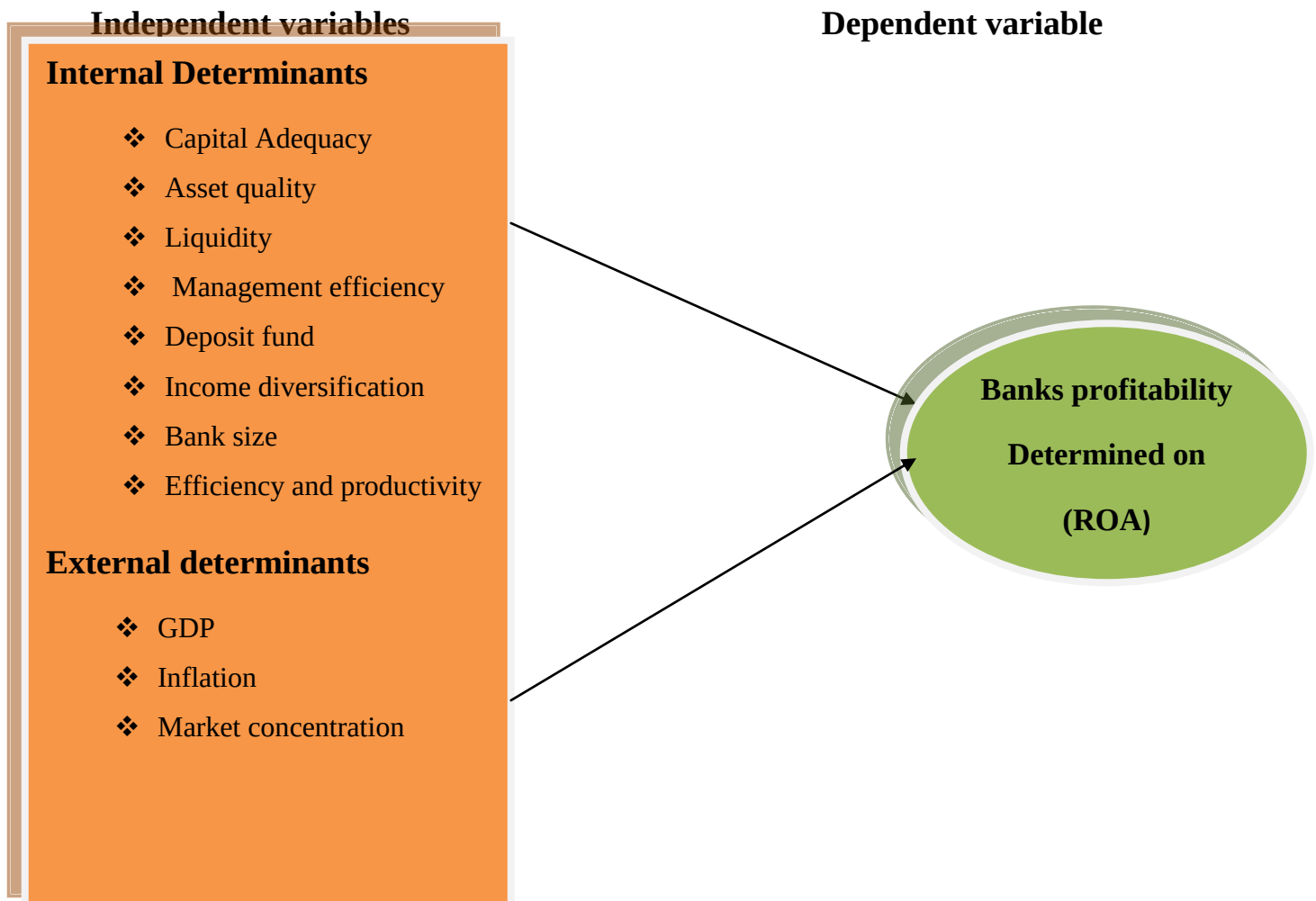
According to Aburime (2006) Clear suggestion, the single ratio measures of efficiency can hardly serve as proxy for the technical efficiency measures. The single ratio measures are too simplistic and are devoid of sufficient information to capture the input-output relationship and characteristics of a typical bank in view of their highly aggregated nature. Higher the efficiency levels of a bank, higher its profits level. Hence, a positive relationship posited between efficiency and profitability of banks. Empirical evidence from Athanasoglou et al. (2005) shows that labor productivity growth has a positive and significant effect on bank profitability. This suggests that higher productivity growth generates income that partly channeled to bank profits. The

commercial banks can target high levels of efficiency and productivity growth both by keeping the labor force steady and by increasing overall output.

Ramlall (2009) said the higher the efficiency level of a bank, the higher the profits level. In this research efficiency and productivity were measured by the ratio of gross income to total employees.

### 3.7. Conceptual Framework

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



Source: Own design

**Figure 3.6:** Relation between profitability and its determinants

### 3.8. Model specification

The researcher used the multiple linear regression models and ordinary least square (OLS) estimation method. The characteristics of the model and proposed variables likely not violate the classical assumptions underlying the OLS model. Therefore the five basic assumption of classical linear regression model were tested. These CLRM assumptions were used to give certain properties to the OLS estimators. The precision of OLS estimators was measured by their standard errors in the study. In addition the overall goodness of fit of multiple regression model was measured by the coefficient of determination  $R^2$  adjusted  $R^2$ . Modeling was based on panel data techniques. A multiple linear regression model was used to determine the relative importance of each independent variable to determine banks profitability.

The p-value of explanatory variables was used to test the hypotheses at a 1%, 5% and 10% significance level. The multiple linear regressions model for ROA shown on equations below. These models were run by using E-views 6 software. The six private commercial banks financial statement for the period covering from 2005-2014 was used to analyze the profitability of primary peer group of private banks in Ethiopia. The adopted regression models are presented as follow:

$$ROA_{it} = \alpha + \beta_1 CAP + \beta_2 ME + \beta_3 DFIN + \beta_4 LQ + \beta_5 BSZ + \beta_6 AQ + \beta_7 DPF + \beta_8 EP + \beta_9 GDP + \beta_{10} INF + \beta_{11} MKt + \epsilon_{it}$$

Where:

**ROA<sub>it</sub>** = Return on asset for bank i at time t

**CAP<sub>it</sub>** = Capital strength for bank i at time t

**ME<sub>it</sub>** = Managerial efficiency for bank i at time t

**DFIN<sub>it</sub>** = Income diversification for bank i at time t

**LQ<sub>it</sub>** = Liquidity risk for bank i at time t

**BSZ<sub>it</sub>** = The natural logarithm of total asset for bank i at time t

**AQ<sub>it</sub>** = Credit risk for bank i at time t

**DPF<sub>it</sub>** = Deposit fund for bank i at time t

**EPit** = Efficiency and productivity for bank i at time t

**GDPit** = Real GDP growth for bank i at time t

**INFit** = Inflation rate for bank i at time t

**MKTit**= Market concentration for bank i at time t

**eit** =error term, and  $t = 2005-2014$ ,  $\alpha$ = constant for each bank (fixed effects),  $\beta$ = internal and external coefficients

## CHAPTER- FOUR

### RESULTS AND DISCUSSION

This chapter deals with the results of study which include descriptive statistics of variables, correlation results for dependent and explanatory variables, diagnosis test for the regression models, and regression analysis for profitability measures i.e. return on asset and Secondary data analysis was done by using E-views 6 software.

#### 4.1. Descriptive statistics of variables

In this section descriptive statistics for the dependent; Return on Asset (ROA) and explanatory variables involved in the regression model are presented. Mean, maximum, minimum and standard deviation values are included in the table below. These figures under the table shows give overall description about statistics data used in the regression models for all variables.

Table 4.1 Descriptive statistics of variables

| Variables | Observation | Mean  | Max    | Min   | Std. Dev |
|-----------|-------------|-------|--------|-------|----------|
| ROA       | 60          | 0.040 | 0.059  | 0.005 | 0.009    |
| CAP       | 60          | 0.130 | 0.279  | 0.020 | 0.043    |
| ME        | 60          | 0.843 | 10.575 | 0.078 | 1.297    |
| DFIN      | 60          | 0.037 | 0.076  | 0.019 | 0.011    |
| LQ        | 60          | 0.363 | 0.569  | 0.159 | 0.104    |
| BSZ       | 60          | 9.764 | 10.341 | 9.030 | 0.305    |
| AQ        | 60          | 0.035 | 0.098  | 0     | 0.018    |
| DPE       | 60          | 0.773 | 0.871  | 0.668 | 0.050    |
| EP        | 60          | 0.178 | 0.290  | 0.099 | 0.035    |
| GDP       | 60          | 0.110 | 0.133  | 0.086 | 0.014    |
| INF       | 60          | 0.171 | 0.364  | 0.028 | 0.110    |
| MKT       | 60          | 0.405 | 0.505  | 0.352 | 0.047    |

Source: Output of EViews 6.

According to the above table 4.1, all variables comprised 60 observations and the profitability measure used in this study namely; ROA indicates that the primary peer group of Ethiopian banks attained, on average, a positive before tax profit over the last ten years. For the total sample, the mean of ROA was 4% with a minimum of 0.5% and a maximum of 5.9%. That means, the most profitable bank among the sampled banks earned 5.9 cents of profit before tax for a single birr invested in the assets of the firm. On the other hand, the least profitable bank of the sampled banks earned 0.5 cents of profit before tax for each birr invested in the assets of the firm. The standard deviation statistics for ROA was 0.009 which indicates that the profitability variation between the selected banks was very small. The result implies that these banks need to optimize the use of their assets to increase the return on their assets.

Regarding the explanatory variables of the model there are some interesting statistics that have to be mentioned. Despite the small dispersion in the minimum and maximum observation of ROA there could be seen relatively high variation in the equity to asset ratio. On average, the equity-to-asset ratio equals 13% with a maximum of 27.9%, which was considerably above the statutory requirement of 8% set by NBE based on Basel II recommendation, even if its minimum value was 2%. The standard deviation statistics for capital strength was 0.043 which shows the existence of relatively higher variation of equity to asset ratio between the selected banks compared to the variation in ROA.

On the other hand, the mean of operating expenses to gross income ratio is 84.3%. This implies most banks from the sample incurred 84.3% operating expenses out of the total gross income per year. In other words the bank incurred 0.843 cents as operating expenses out of one birr gross income. The most efficient banks incurred 7.8% of operating expenses and the inefficient banks incurred 105.75% percent operating expenses. This indicated the efficient banks have cost management advantage over the inefficient banks.

When it comes to diversification of income from the selected primary peer group private commercial banks 7.6% of the income generated other than the main source of income while the minimum percentage of income was reported 1.9% and standard deviation shows the existence of less variation among the primary peer group of selected private commercial banks in diversifying their source of revenue.

On the other hand, the outputs of the descriptive statistics indicate that, the ratio of liquid assets to total assets was 36.3%, on average, with a minimum of 15.9% and a maximum of 56.9%. The mean value of liquidity shows that the primary peer group of Ethiopian private commercial banks was very liquid, two times more than the minimum statutory liquidity ratio of 20 percent set by National Bank of Ethiopia (NBE) in January 2012.

The bank size plays an important role to maintain the position of a bank in the market. The size of primary peer group of private commercial banks under this study has mean value of 9.76, and the maximum and minimum value of 10.34 and 9.03 respectively. But the standard deviation value is 0.3 which the second highest value among independent variables. These results show that primary peer group of selected commercial banks in Ethiopia have a small variation in their total asset.

Asset quality has the average value of 3.56% and the standard deviation value of 1.8%. The minimum and maximum value is 0% and 9.85 respectively. The mean value of asset quality indicates that about 3.56% percent of total loan and advance of primary peer group of private commercial banks in Ethiopia was comprises non-performing loans. Thus, primary peer group of private commercial banks have a satisfactory asset quality; because the result is not far from the average value (5 percent) of NPL from their loan and advance as reported in Access Capital Research (2010).

Concerning deposit-asset ratio there is large variation indicated by the range between 66.8% and 87.1%. The mean of deposit to asset ratio is 77.3%. This indicates the large portion of the asset of most commercial banks composed from customer deposit. This has a negative implication when large numbers of financial institution liability holders seek to withdraw their financial institution at the same time.

The mean of efficiency and productivity of employee to earnings before interest and tax ratio is 17.8%. The maximum and the minimum values are 29% and 9.9% respectively. This implies there is high variation in man power utilization in banks in the industry.

Table 4.1 also shows that the mean real GDP growth in Ethiopia for the last ten years was 11% with a maximum of 13.3% and a minimum of 8.6 %. Table 4.1 also presents for GDP a small

standard deviation of 0.014; this implies that economic growth in Ethiopia during the period of 2005 to 2014 remains reasonable stable and the result was more or less in agreement with the governments report regarding economic growth.

The other macro-economic variable employed in this study inflation, had somewhat a higher standard deviation 11% compared to GDP; this implies that inflation rate in Ethiopia during the study period remains somewhat unstable.

Finally, the last descriptive statistics of the Herfindahl – Hirschman index indicate that there is significant variation in concentration of banks in the banking sector. The mean of industry concentration was 0.40, meaning that the industrial concentration level of the primery peer group of Ethiopian private commercial bank during the analyzed period 2003-2014 was highly concentrated. The most concentrated bank in the sector has the maximum value of 50.5% share and the least concentrated bank in the sector has the minimum value of 35% share. This indicates the current market share difference in primary peer group of private commercial bank sector in Ethiopia.

## **4.2. Correlation analysis between study variables**

Correlation analysis is a statistical tool which is used to measure the strength or degree of linear association between two variables. The correlation coefficient, which always lays between -1 and +1, was used to measure the strength and magnitude or degree of linear association between two series. A correlation coefficient of +1 shows a strong and positive linear relationship between two variables. On the contrary, a correlation coefficient of -1 indicates a strong and negative linear association between two series. A correlation coefficient of 0 shows that there is little or no linear relationship between two variables.

In this section the correlation between profitability measures; return on asset, and explanatory variables; capital adequacy, managerial efficiency, diversification of income , liquidity, bank size, asset quality, deposit fund, efficiency and productivity, GDP, inflation and market concentration have been presented and analyzed. A correlation matrix used to ensure the correlation between explanatory variables with return on asset. Cooper & Schindler (2009) suggested that a correlation coefficient above 0.8 between explanatory variables should be



corrected for because it is a sign for multicollinearity problem. Mashotra (2007) argued that the correlation coefficient can be 0.75. Lastly, Hair *et al.* (2006) argued that also correlation coefficient below 0.9 may not cause serious multicollinearity problem.

#### **4.2.1. Correlation analysis between return on asset and explanatory variables**

The ROA reflects the ability of a bank's management to generate profits from the bank's assets and this profitability measure is correlated with other explanatory variables either positively or negatively. In table 4.2 below, the correlation analysis was undertaken between profitability measure; return on asset and explanatory variables; capital adequacy, management efficiency, diversification of income, liquidity, bank size, asset quality, deposit fund, efficiency and productivity, GDP, INF and market concentration.

As it can be seen from the table below, there was a positive correlation between return on asset and capital adequacy, diversification of income, liquidity, bank size and inflation. This relationship supports Dietrich & Wanzenried (2009). It is found that, better capitalized banks seem to be more profitable, Uzhegova (2010) further argued that product mix reduces total risks because income from non-interest activities is not correlated or at least perfectly correlated with income from fee based activities and as such diversification should stabilize operating income and give rise to a more stable stream of profit. Kamau (2009) argued that when banks hold high liquidity, they do so at the opportunity cost of some investment which could generate high return, Smirlock (1985) supported that the effect of bank size to be positive relationship on profitability and finally Burke (1989), Molyneux & Thorn (1992), Hassan & Bashir (2003), Kosmidou (2006) has observed a positive correlation impact on inflation and profitability.

Whereas, there is a negative correlation between primary peer groups of private commercial banks profitability measure; return on asset and management efficiency, asset quality, deposit fund, efficiency and productivity and GDP. This relationship supported prior researcher that Sufian & Chong (2008) argued poor expense management is the main contribution to poor profitability, Kosmidou (2008) conclude that a negative significant relationship between asset quality to bank profitability, this was in line with the theory that increased exposure to credit risk is normally associated with decrease firms profitability.

Table 4.2 Correlation matrix of Dependent and Independent Variables

|      | ROA    | CAP    | ME     | DFIN   | LQ     | BSZ    | AQ     | DPF    | EP     | GDP    | INF    | MKT   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| ROA  | 1.000  |        |        |        |        |        |        |        |        |        |        |       |
| CAP  | 0.426  | 1.000  |        |        |        |        |        |        |        |        |        |       |
| ME   | -0.590 | -0.119 | 1.000  |        |        |        |        |        |        |        |        |       |
| DFIN | 0.649  | 0.259  | -0.212 | 1.000  |        |        |        |        |        |        |        |       |
| LQ   | 0.144  | -0.115 | -0.047 | 0.266  | 1.000  |        |        |        |        |        |        |       |
| BSZ  | 0.235  | 0.068  | -0.084 | 0.197  | -0.104 | 1.000  |        |        |        |        |        |       |
| AQ   | -0.317 | -0.165 | 0.411  | -0.061 | 0.470  | -0.459 | 1.000  |        |        |        |        |       |
| DPF  | -0.431 | -0.648 | 0.124  | -0.316 | -0.134 | 0.037  | 0.109  | 1.000  |        |        |        |       |
| EP   | -0.134 | 0.261  | 0.062  | -0.013 | -0.159 | 0.599  | -0.151 | 0.040  | 1.000  |        |        |       |
| GDP  | -0.062 | -0.230 | 0.026  | 0.022  | 0.075  | -0.510 | 0.185  | 0.150  | -0.472 | 1.000  |        |       |
| INF  | 0.017  | 0.105  | 0.078  | -0.081 | 0.207  | 0.170  | 0.131  | -0.111 | 0.023  | -0.447 | 1.000  |       |
| MKT  | -0.137 | -0.192 | 0.005  | -0.186 | -0.254 | -0.764 | 0.158  | 0.189  | -0.587 | 0.674  | -0.312 | 1.000 |

Source: Output of Eview-6

#### 4.2.2. Correlation analysis between explanatory variables

The correlation between explanatory variables; capital adequacy, management efficiency ,diversification of income ,liquidity ,bank size ,asset quality ,deposit fund ,efficiency and productivity ,GDP ,INF and market concentration included in this study are presented and analyzed.

A correlation is a single number that describes the degree of relationship between two variables. In other words, multicollinearity describes the relationship among explanatory variables. As indicated under the table 4.3 on the correlation matrix almost all correlations that have occurred among explanatory variables are surprisingly weak correlations; this indicates there is no the existence of multicollinearity problem on the study. Even if, relatively high positive correlation existed between employee productivity and bank size (**0.87**) the researcher ignored this near multicollinearity problem. Because Hair *et al.* (2006) argued that also correlation coefficient below 0.9 may not cause serious multicollinearity problem.

As presented in table 4.3 below, capital adequacy has a positive correlation coefficient with diversification of income, bank size ,efficiency and productivity and inflation except a negative

relationship between management efficiency ,liquidity, deposit fund, GDP and market concentration with the value 0.259,0.068,0.175,0.106,-0.119,-0.115,-0.165,-0.648,-0.230 and -0.192 respectively.

Managerial efficiency has a positive multicollinearity coefficient with asset quality, deposit fund, GDP, inflation and market concentration with the value of 0.411, 0.124, 0.026, 0.078, and 0.005 respectively and has also a negative correlation among income diversification ,liquidity, employees efficiency and productivity with the value of -0.212,-0.047,-0.084 and -0.086 respectively.

Table 4.3 correlation matrix of independent variables

|      | CAP    | ME     | DFIN   | LQ     | BSZ    | AQ     | DPF    | EP     | GDP    | INF    | MKT   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| ROA  |        |        |        |        |        |        |        |        |        |        |       |
| CAP  | 1.000  |        |        |        |        |        |        |        |        |        |       |
| ME   | -0.119 | 1.000  |        |        |        |        |        |        |        |        |       |
| DFIN | 0.259  | -0.212 | 1.000  |        |        |        |        |        |        |        |       |
| LQ   | -0.115 | -0.047 | 0.266  | 1.000  |        |        |        |        |        |        |       |
| BSZ  | 0.068  | -0.084 | 0.197  | -0.104 | 1.000  |        |        |        |        |        |       |
| AQ   | -0.165 | 0.411  | -0.061 | 0.470  | -0.459 | 1.000  |        |        |        |        |       |
| DPF  | -0.648 | 0.124  | -0.316 | -0.134 | 0.037  | 0.109  | 1.000  |        |        |        |       |
| EP   | -0.134 | -0.086 | 0.367  | -0.056 | 0.879  | -0.468 | 0.099  | 1.000  |        |        |       |
| GDP  | -0.230 | 0.026  | 0.022  | 0.075  | -0.510 | 0.185  | 0.150  | -0.472 | 1.000  |        |       |
| INF  | 0.105  | 0.078  | -0.081 | 0.207  | 0.170  | 0.131  | -0.111 | 0.023  | -0.447 | 1.000  |       |
| MKT  | -0.192 | 0.005  | -0.186 | -0.254 | -0.764 | 0.158  | 0.189  | -0.587 | 0.674  | -0.312 | 1.000 |

Source: Output of Eview-6

As per above table income diversification has a positive correlation coefficient except asset quality deposit fund inflation and market concentration with the value of -0.061,-0.316,-0.081and -0.186 respectively. Liquidity has negative correlation coefficient except asset quality, GDP and inflation with the value of 0.470, 0.075 and 0.207 respectively. Size has positive relation with deposit fund 0.347, employee productivity **0.87** and inflation 0.17.

Hence, the majority of the asset of the primary peer group of Ethiopian private commercial banks composed from deposit liability. When the size of the bank increased, the man power utilization capacity of the bank also increased. That is why the existence of relatively high positive correlation between size and employee productivity. Lastly, market concentration has a negative correlation between capital adequacy -0.192, diversification of income -0.186, liquidity -0.254, bank size -0.765, employee's efficiency -0.653 and inflation -0.312 and a positive correlation between management efficiency 0.005, asset quality 0.159, deposit fund 0.189 and GDP with value of 0.674.

### **4.3. Regression analysis results and discussions**

In this section regression analysis for banks profitability measures; return on asset and the relationship between determinants of bank profitability and explanatory variables. Regression analyses were done to examine the relationship between profitability measures and independent variables. A fixed cross-sectional effect is specified in the estimation to capture unobserved idiosyncratic effects of different banks. In addition, as noted in Gujarati (2004) if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model. Hence, the choice here is based on computational convenience. On this score, fixed effect model may be preferable than random effect model (Gujarati 2004). Since the number of time series (i.e. 10 year) is greater than the number of cross-sectional units (i.e. 6 primary peer group of private commercial banks in Ethiopia) and adjusted  $R^2$  value and Durbin-Watson stat value increases with the use of cross-sectional fixed effect model, fixed effect model is preferable than random effect model in this case.

As noted in Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators. Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not in the model. Thus, the following section discusses about the nature and significance of the model specification tests and CLRM assumption were as follows.

#### **4.4 Results for test of classical linear regression model (CLRM) assumptions**

The five basic assumptions relating to the linear regression model (CLRM) were made in this study. Test of these assumption were required to show the fulfillment of desirable properties of estimation technique and to ascertain the validity of hypotheses test results on the coefficient estimates. The diagnostic tests were made by the researcher before running the regression model, which says the return on asset was a function of independent variables to ensure that the data fits the basic assumption of classical linear regression model.

##### **Test for average value the error term**

The test for the mean of the error term is zero is the first diagnostic test conducted in the study. According to Brooks (2008) the existence of constant term in the regression equation will prevent the violation of the assumption the average value of errors is zero. Because the equation or multiple regression model developed in this study included the constant term the assumption of the mean value the error term is zero was not violated.

##### **Test of Heteroscedasticity test: white test**

The second assumption of CLRM stated that the variance of the errors is constant,  $\sigma^2$  this is known as the assumption of homoscedasticity. If the residuals of the regression have systematically changing variability over the sample, that is a sign of heteroscedasticity. White test was used for general test of heteroscedasticity. Since, table 4.4 below, shows that the test result for regression analysis's  $p$ -value are considerably in excess of 0.05, so that there is no evidence for the presence of heteroscedasticity.

Table 4.4 Heteroskedasticity Test: White test results

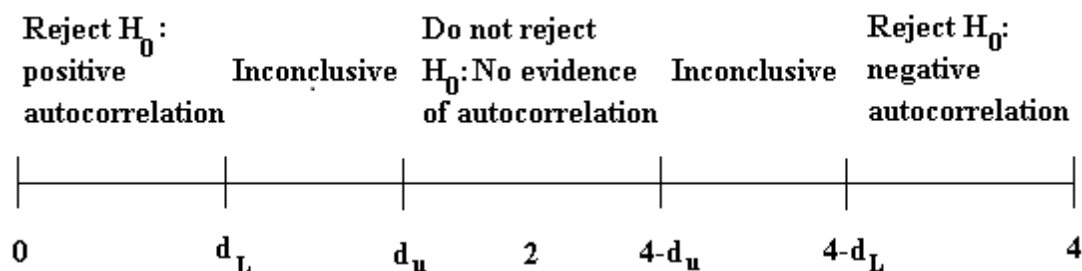
|                     |          |                      |        |
|---------------------|----------|----------------------|--------|
| F-statistic         | 1.280466 | Prob. F(11,48)       | 0.2643 |
| Obs*R-squared       | 13.61208 | Prob. Chi-Square(11) | 0.2552 |
| Scaled explained SS | 16.22720 | Prob. Chi-Square(11) | 0.1329 |

Source: Output of Eview-6

### Autocorrelation test: Durbin-Watson (DW) test

This is an assumption that the error term are linearly independent of one another (uncorrelated with one another). If the errors are correlated with one another, it would be stated that they are autocorrelated. To test for the existence of autocorrelation or not, the popular Durbin-Watson test was employed. As noted in Brook (2008) the rejection/non-rejection rule would be given by selecting the appropriate region from the following figure.

Figure 4.1 Durbin-Watson has 2 critical values: an upper critical value ( $d_U$ ) and a lower critical value ( $d_L$ )



The Durbin-Watson test statistic value in table 4.5 was 1.600. To identify determinants of primary peer group Ethiopian private commercial banks, 60 ( $10 \times 6$ ) observations were used in the model. In addition, there were 11 repressors and an intercept term in the model. Therefore, to test for autocorrelation, the DW test critical values were used. The relevant critical lower and upper values for the test are  $d_L = 1.037$  and  $d_U = 1.865$  respectively, for 60 observations and 11 repressors. The values of  $4 - d_U = 4 - 1.865 = 2.135$ ;  $4 - d_L = 4 - 1.037 = 2.963$ . The critical value i.e. 1.60 lies between the lower and the upper limit, there is inconclusive evidence regarding the presence or absence of positive first-order serial correlation.

Table 4.5 Autocorrelation Test: Durbin Watson

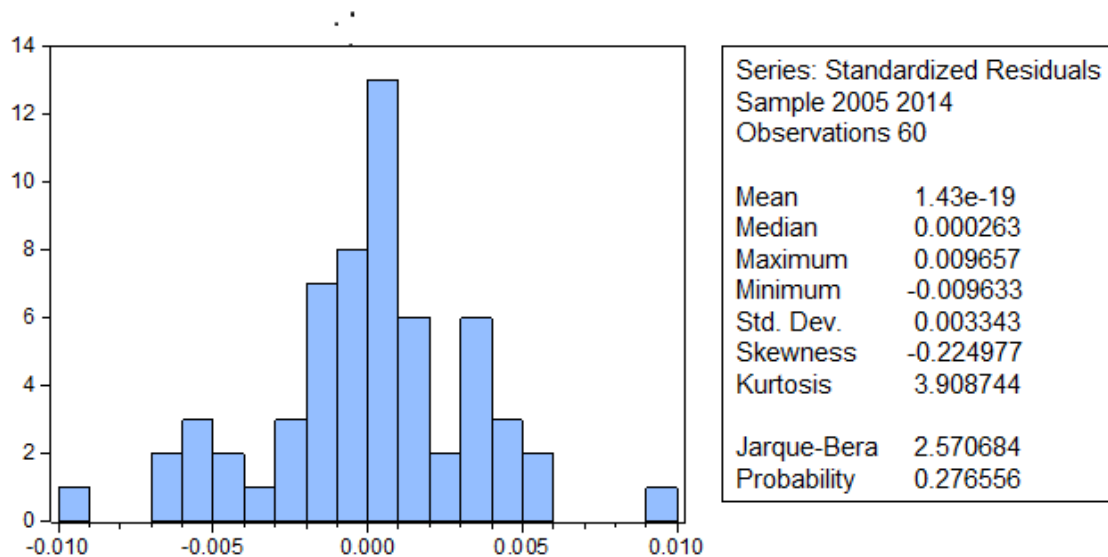
| Variables                 | DW test static result |
|---------------------------|-----------------------|
| All explanatory variables | 1.60                  |

Source: Output of Eview-6

### Normality test: Bera-Jarque (BJ) test

Finally, assumption five require to check whether the disturbances are normally distributed or not. According Chris brooks (2008), one of the most commonly applied tests for normality is the Bera-Jarque (BJ) test. Bera-Jarque uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments, the mean and the variance. If the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant. This means that the  $p$ -value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level.

Figure 4.2 Normality test of residual (Bera-Jarque )



Source: Output of Eviews 6

Thus, the study were test for this assumption and as it can be seen from the above table, the Bera-Jarque result was a probability of 0.28 for return on asset regression model this implies that the inferences we made about the coefficient estimates was appropriate.

#### 4.5 Regression analysis result between ROA and explanatory variables

This section presents the empirical findings from the econometric results on the factors affecting the determinants of primary peer group of private commercial banks profitability in Ethiopia. The section covers the empirical regression model used in this study and the results of the regression analysis.

**Empirical model:** As presented in the third chapter the empirical model used in the study in order to identify the factors that can affect determinants of profitability of primary peer group of private commercial banks in Ethiopia provided as follows:

$$\text{ROA}_{it} = 0.55 + 0.001\text{CAP} - 0.002\text{ME} + 0.09\text{DFIN} - 0.011\text{LQ} - 0.05\text{BSZ} - 0.08\text{AQ} - 0.06\text{DPF} + 1.25\text{EP} + 0.11\text{GDP} + 0.01\text{INF} - 0.08\text{MKt}$$

In the following table coefficients, standard errors, t-values, and p-values for explanatory variables, and R-squared, Adjusted R-squared, Standard Error of regression, F-statistic, Prob (F-statistic) for the regression, and number of observations included in the study are presented.

Table 4.6 Regression analysis result between ROA and explanatory variables

| Variables          | Coefficient | Std. Error         | t-Statistic | Prob.     |
|--------------------|-------------|--------------------|-------------|-----------|
| C                  | 0.546866    | 0.115595           | 4.730895    | 0.0000*** |
| CAP                | 0.014137    | 0.021095           | 0.670154    | 0.5063    |
| ME                 | -0.002956   | 0.000499           | -5.919974   | 0.0000*** |
| DFIN               | 0.092200    | 0.074020           | 1.245607    | 0.2197    |
| LQ                 | -0.005962   | 0.009671           | -0.616495   | 0.5408    |
| BSZ                | -0.047719   | 0.010522           | -4.535152   | 0.0000*** |
| AQ                 | -0.080707   | 0.058596           | -1.377334   | 0.1755    |
| DPF                | -0.061654   | 0.018465           | -3.338926   | 0.0017*** |
| EP                 | 1.25E-07    | 2.20E-08           | 5.694206    | 0.0000*** |
| GDP                | 0.109719    | 0.064948           | 1.689336    | 0.0984*   |
| INF                | 0.003425    | 0.005631           | 0.608123    | 0.5463    |
| MKT                | -0.077441   | 0.038571           | -2.007756   | 0.0510**  |
| R-squared          | 0.863786    | Durbin-Watson stat |             | 1.603622  |
| Adjusted R-sq      | 0.813102    | Number of Obs.     |             | 60        |
| S.E. of regression | 0.003916    |                    |             |           |
| F-statistic        | 17.04251    |                    |             |           |
| Prob(F-statistic)  | 0.000000    |                    |             |           |

\*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10% levels respectively

Source: Output of Eviews 6



As it can be seen from the above table 4.6 the estimation result of the operational panel regression model used the R-squared statistics and the adjusted-R squared statistics of the model was 86.4% and 81.3% respectively. The result indicates that the changes in the independent variables explain 81.3% of the changes in the dependent variable. That is capital adequacy, management efficiency, income diversification, liquidity, bank size, asset quality, deposit fund, efficiency and productivity, GDP, inflation rate and market concentration collectively explain 81.3% of the changes in ROA. The remaining 18.7% of changes was explained by other factors which are not included in the model. Thus these variables collectively, are good explanatory variables of the determinants p-value was sufficiently low and F-statics value of 0.000 indicates strong statistical significance, which enhanced the reliability and validity of the model.

Based on the results show in the table 4.6 all explanatory variables except capital adequacy, income diversification, liquidity, asset quality and inflation had significant impact on profitability. Among the significant variables managerial efficiency, bank size, employees' efficiency of profitability of primary peer group of private commercial banks in Ethiopia. The null hypothesis of F-statistic (the overall test of significance) that the R-squared is equal to zero was rejected at 1% were significant at 1%significance level since the p-value were 0.0000 except deposit fund was a p-value of 0.0017.

Finally, variables like market concentration and GDP were significant at 5% and 10% significance levels.

Besides, also show that the coefficient of managerial efficiency ,liquidity ,bank size, asset quality, deposit fund and market concentration against ROA were negative as far as the coefficient for those variables were negative with the values are -0.006,-0.05,-0.08,-0.06 and -0.08 respectively. These indicated that there were an inverse relationship between the aforementioned six independent variables and ROA.

On the other hand, variables like capital adequacy, income diversification, employees' productivity, GDP and inflation rate had a positive relationship with profitability as far as their respective coefficients values were 0.01, 0.09, 1.25, 0.11 and 0.003. This revealed that there was a direct relationship between the above five independent variables and ROA. In general as per

the regression results provided in table 4.6 among the eleven explanatory variables used in this study six of them were significant.

So far, the results of the documentary analysis which includes tests for the classical linear regression model, descriptive statistics, correlation matrix and regression analysis have been presented. The results of the tests for the classical linear regression model showed as the data fit the basic assumptions of CLRMs. At last based on the regression result the determinants of profitability try to test the hypotheses of each independent variable discussed individually as follows.

#### **4.6 Hypotheses testing for independent variables**

**Capital adequacy (CAP):** The result of coefficient of the capital adequacy (CA) is positive and it is statistically insignificant determinants of profitability for ROA with the p-value of 0.5063 significance level. This finding is consistent with previous studies with regulators would like to have higher minimum requirements to reduce cases of bank failures, whilst bankers in contrast argue that it is expensive and difficult to obtain additional equity and higher requirements restrict their competitiveness (Koch, 1995). Beckmann (2007) argued that high capital lead leads to low profits since banks with a high capital ratio are risk-averse, they ignore potential risk investment opportunities and, as a result, investors demand a lower return on their capital in exchange for lower risk. Hence, the researcher failed to reject the null hypothesis because according to the finding of the study, capital adequacy has no impact on determinants of profitability of primary peer group private commercial banks in Ethiopia.

**Management efficiency (ME):** The other important determinants of profitability is management efficiency which was negative and statistically significant at 1% significance level (p-value=0). This showed that minimizing banks operating costs in these banks would certainly improve the banks performance in general and profitability in particular. This finding was consistent with many previous studies, e.g. Athanasoglou et al. (2008), Sufian & Chong (2008) and Sastrosuwito & Suzuki (2011). Coming back to this particular study, the result revealed that in the context of the Ethiopian banking industry like that of Sufian & Chong (2008) result, the ratio of cost to income exhibits a negative and significant impact on the ROA. Therefore, operational efficiency exists as one of the major determinant factor that can influence Ethiopian banks profitability in

an unfavorable way. Hence, the null hypothesis was rejected in the study because operating expense has a negative significant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. This result was also consistent with the existed reality in the Ethiopian banking industry where the efficiency was definitely lower.

**Diversification Income (DFIN):** The ratio of non-interest income to total assets which is a measure of diversification and business mix have a positive effect on profitability, which is in agreement with a prior expectation. In addition, this variable was not statistically significant at significance level ( $p\text{-value}=0.2197$ ) in explaining the variability in ROA of primary peer group private commercial banks. Thus, income diversification was considered as a vital driver of the profitability of these banks in Ethiopia. That means in the private banks for the last ten years a portion of revenue were generated from this activities and one of the relevant drivers of their performance in general and profitability in particular. Hence the researcher failed to reject the null hypothesis because according to the finding of the study, income diversification no impact on determinants of profitability of primary peer group private commercial banks in Ethiopia. This result was also consistent with the previous findings Albertazzi and Gambacorta (2006) as cited by Uzhegova (2010) noted that the decline in interest margins, has forced banks to explore alternative sources of revenues, leading to diversification into trading activities, other services and non-traditional financial operations. Beside, this the concept of revenue diversifications follows the concept of portfolio theory which states that individuals can reduce firm-specific risk by diversifying their portfolios. Further more the result of this study was also in agreement with what is existed in reality in the Ethiopian context which shows the shifting of banks from interest based income to non-interest one as a result of relatively growing competition this days.

**Liquidity risk (LQ):** Liquidity is one of the determinants of profitability of primary peer group of private commercial banks. The impact of liquidity on profitability is negative and insignificant. However, even if the coefficient of liquidity was negative, it was not statistically significant with ( $p\text{-value}= 0.5408$ ), showing that its influence is negligible. Therefore, the researcher failed to reject the null hypothesis because according to the finding of the study, liquidity has no impact on determinants of profitability of primary peer group private commercial banks in Ethiopia. Moreover, the insignificant parameter indicates that the liquidity structure does not affect these

banks profitability. Referring to previous studies, Molyneux & Thornton (1992) and Guru et al. (2002) find a negative relationship between liquidity and bank profitability.

**Bank size (BSZ):** Bank size which is measured by the natural log of total assets had a negative impact on the profitability of primary peer group of private commercial banks in Ethiopia and conforms to a hypothesis. The variable was also statistically significant at 1% significance level in the model with a p value of 0.00001. Hence, the null hypothesis was rejected in the study because bank size has a negative significant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. Prior study support larger banks too complex to manage and diseconomies of scale arise. The effect of size could therefore be nonlinear; meaning that profitability is likely to increase up to a certain level by achieving economies of scale and decline from a certain level in which banks become too complex and bureaucratic. This analysis uses the logarithm of total asset to capture the potential non-linear effect of size similar to Athanasoglou et al. (2008) and Sastrosuwito & Suzuki (2011).

**Asset Quality (AQ):** The other important determinant of profitability in primary peer group of private commercial banks in Ethiopia is Asset quality. The variable was statically insignificant with the p value of 0.1755 and a negative beta coefficient of -0.080707. Consistent with these evidences, the null hypothesis was failed to rejected in the study because asset quality has a negative insignificant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. Thus, the negative sign of loan loss reserve to total loans implies that banks should exert efforts on implementing credit risk management, which the national bank of Ethiopia(NBE) is seriously working on to assist the banks to evaluate credit risk more effectively and to avoid problems associated with loan defaults. According to most literature (e.g. Athanasoglou et al., 2008 and Ommeren, 2011) this variable is the proxy for the asset quality of the firm. When the asset quality of the firm reduce the credit risk exposure of the firm is increased. According to this empirical fact, the problem symptom of asset quality is not present in primary peer group of private commercial banks in Ethiopia. This implies the existence of small amount non-performing loan from the total loan and advance. Since asset quality has negative and insignificant impact on these banks profitability.

**Deposit fund (DPF):** Concerning deposit fund, it has negative and significant effect on the assets return (ROA) of primary peer of private commercial banks in Ethiopian at 1% significance

level with a p value of 0.0017 a negative beta coefficient value of -0.061654. Therefore the null hypothesis was rejected in the study because deposit fund has a negative significant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. This research finding is also consistent with the prior empirical evidence (e.g Ommeren, 2011; and Belayeneh, 2011 ), they believed that, Since, time and savings deposits represent a relatively higher cost source of funds, the more a banks were committed to time and saving deposit, the higher would be the funding cost and hence the lower the profits. However, this finding is contradicted with empirical evidence from Naceur and Goaied (2001) indicate that the best performing banks are those who have maintained a high level of deposit accounts relative to their assets. Increasing the ratio of total deposits to total assets means increasing the funds available to use by the bank in different profitable ways such as investments and lending activities. In turn, this should increase the bank's returns on assets ceteris paribus (Allen & Rai, 1996, Holden & El-Bannany, 2006; Rasiah, 2010; and Moin, 2008). They suggested that, the primary function of the commercial banks are collecting deposits and giving loan to the public from these deposits.

**Efficiency and productivity (Employees):** Regarding with that employees efficiency and productivity growth has a positive and significant effect on profitability at a significant of 1% with (p-value 0.000). They reflect that, due to banks is service rendering organization and most employees are front-line workers, this variable extremely determines the profitability of the banks. Therefore the null hypothesis was rejected in the study because employees efficiency and productivity has a positive significant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. This suggests that higher productivity growth generates income that is partly channeled to bank profits. In other words, primary peer group of private commercial banks increase their profits from improved labor productivity, which, among other things, is a result of the higher quality of newly hired labor and improve the performance of the total number of employees. This finding is consistent with that of Athanasoglou et al. (2005) and Ramlall (2009) indicates that the higher the efficiency and productivity level of a bank, the higher the profits level.

**Gross domestic product (GDP):** The other import and determinants of profitability in primary peer group of private commercial banks are gross domestic product (GDP) .The level of GDP

growth rate is a measure of the total economic activity and is expected to have an impact on numerous factors related to the supply and demand for loans and deposits. It is statistically significant at 10 percent level of significance with a p value of 0.0984 and it has a positive beta coefficient of 0.109719 in relationship with return on assets (ROA). Therefore, the null hypothesis was rejected in the study because GDP has a positive significant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. The result is consistent with the findings of Andreas and Gabrielle (2009), Athanasoglou *et al* (2008), and Yuqi Li (2006).

**Inflation (INF):** The coefficient of inflation was positive as anticipated, but it was not statistically significant, thus, the effect of inflation on primary peer group of private commercial banks profitability is not significant. The findings also suggested that as inflation is not a significantly determinant as far as the parameter for this variable is insignificant as illustrated by the largest p-values of 0.5463 all the remaining variables. Therefore, the researcher failed to reject the null hypothesis because according to the finding of the study, inflation has no impact on determinants of profitability of primary peer group private commercial banks in. In terms of inflation impact on ROA, previous studies of Demirguc-Kunt & Huizinga, 1999 showed a positive result and this implies that during the period of the study, inflations was anticipated which gave banks the opportunity to adjust the interest rates accordingly, resulting in revenues that increased faster than costs, with a positive impact on profitability. However, the result of this study clearly shows as inflation has a positive impact on profitability and statistically not significant determinant of commercial banks profitability in Ethiopia.

**Market concentration (MKT):** The empirical results show that market concentration affects bank profitability negatively and is statistically significant with a 5% significance level for primary peer group of private commercial banks. Therefore, the null hypothesis was rejected in the study because market concentration has a negative significant impact on determinates of profitability of primary peer group of private commercial banks in Ethiopia. This outcome is inconsistent with (Berger *et al.* 1989; Short, 1979 and Goddard *et al.*, 2004) and other more recent studies, which claim that concentration is usually positive related to profitability once other effects are controlled for in the profitability equation. Market concentration is a long held view that market power is necessary to ensure stability in banking. Banks that are profitable and

well-capitalized are best positioned to withstand shocks to their balance sheet. Hence banks with market power, and the resulting profits, are considered to be more stable Northcott (2004).

Table 4.7 Summary of hypothesized and actual impact of explanatory variables on the Dependent variable

| <b>Variables</b>          |                                               | <b>Hypothesized</b>           | <b>Actual impact</b>       |
|---------------------------|-----------------------------------------------|-------------------------------|----------------------------|
| <b>Internal variables</b> | <b>Capital adequacy</b>                       | positive/negative significant | Positive and Insignificant |
|                           | <b>Management efficiency</b>                  | positive/negative significant | Negative and Significant   |
|                           | <b>Diversification of income</b>              | positive/negative significant | Positive and Insignificant |
|                           | <b>Liquidity management</b>                   | positive/negative significant | Negative and Insignificant |
|                           | <b>Bank size</b>                              | positive/negative significant | Negative and Significant   |
|                           | <b>Asset Quality</b>                          | positive/negative significant | Negative and Insignificant |
|                           | <b>Deposit fund</b>                           | positive/negative significant | Negative and Significant   |
|                           | <b>Efficiency and productivity(employees)</b> | positive/negative significant | Positive and Significant   |
| <b>External variables</b> | <b>GDP</b>                                    | positive/negative significant | Positive and Significant   |
|                           | <b>Inflation</b>                              | positive/negative significant | Positive and Insignificant |
|                           | <b>Market concentration</b>                   | positive/negative significant | Negative and Significant   |

## **Chapter- Five**

### **Conclusions and Recommendations**

It is fact, strong and healthy financial system is a prerequisite for sustainable economic growth of a given country. In order to survive negative shocks and maintain a good financial stability, the financial managers and policy maker should identify the key performance determinants of commercial banks. Because of this, the current study specified an empirical framework to investigate the effect of internal and external determinants on the profitability of primary peer group of Ethiopian private commercial banks from 2005 to 2014. The internal determinants refers to the factors originate from bank accounts (balance sheets and/or profit and loss accounts). The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions.

Empirical results from previous studies conclude that internal factors explain a large proportion of banks profitability; nevertheless, external factors have also an impact on the performance. Over the last ten years a number of important changes occurred in the Ethiopian banking industry, leading to increased competition and pressure bank profitability. The study also used an appropriate econometric methodology for the estimation of variables coefficient under fixed effect regression models. The following sections discussed about the final conclusion remarks of the study and applicable recommendations.

#### **5.1 Conclusions**

- As observed from the regression result from the table 4.6, the explanatory power of independent variables determinants of  $R^2$  model are 86.3% .This indicates, the researcher can conclude that the profitability of primary peer group of Ethiopia private commercial banks explained by both internal and external determinates.
- This study conforms a negative and highly significant relationship between managerial efficiency and profitability on primary peer group Ethiopian private commercial banks for ROA model at 1% significant level. Since managerial efficiency has negative and significant impact on profitability of the sector. This indicted that, poor expense



management is one of the main contribution to poor profitability performance of not only primary peer group of Ethiopian private commercial banks but also other banks in Ethiopia.

- Regarding bank size, the researcher find bank size has negative and highly significant intern of ROA at 1% significant level .This inverse relationship between bank size and profitability. Significant in terms of asset size, suggest that large banks tend to earn lower profits. This indicates that primary peer group of private commercial banks in Ethiopia is inconsistence with the market power (MP) hypotheses, which stated relative size of s firm expands its market power and profit increase. From this research conclude that, primary peer group of private commercial banks in Ethiopia are adversely affected their profitability by asset size. Probably this might due to the existence of bureaucratic, bottleneck system and managerial inefficiency to manage their assets.
- Concerning deposit, it is negatively and significantly affected on ROA of primary peer group Ethiopian private commercial banks at 1% significant level .This indicated, banks received more deposit liability from saving and time/term deposit than demand deposit. Therefore saving and term deposit were relatively high cost of funding hence low profitability.
- Regarding efficiency and productivity the result of this study revealed that efficiency and productivity growth has a positive and significant effect on profitability with at 1% significance level. This suggested that, other things remain constant, primary peer group of private commercial banks in Ethiopia increase the profit from improved labor productivity, which is a result of higher quality of newly hired labor and improvement of the performance of the total number of employees. It also indicates employee's efficiency and productivity is quality of human resource department managers.
- Concerning with regard to macroeconomic indicator, GDP has higher positive and significant effect on profitability with 10% significance level. This result about GDP

supports the argument of the positive association between economic growth and the financial sector performance supported by other empirical literature.

- Finally, market concentration variables, the empirical result shows that market concentration affect negatively and statistically significant at 5% significance level. From this primary peer group of private commercial banks in Ethiopia were moving to a more competitive environment structure at current time.

## **5.2 Recommendations**

Based on the conclusion of the study, the following possible recommendations were forwarded by the researcher.

The bank managers and banks policy maker should be high concern and set direction to collect deposit funds from other than saving and fixed term deposit from un bankable area to minimize stiff computation on deposit collection. Because these sources of funds incur high cost of interest that affect significantly the bank's profitability.

In addition to these banks should give notice in reduction of expenses and other duplication of capital costs, to improve the profitability of the industry. By reducing operating, administrative and personnel expense through using common facilities such as ATM, mobile banking, internet banking.

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#### Appendix –I: Regression analysis result between ROA and explanatory variables

Dependent Variable: ROA  
Method: Panel Least Squares  
Date: 05/02/15 Time: 19:30  
Sample: 2005 2014  
Periods included: 10  
Cross-sections included: 6  
Total panel (balanced) observations: 60

| Variable                              | Coefficient | Std. Error            | t-Statistic | Prob.     |
|---------------------------------------|-------------|-----------------------|-------------|-----------|
| C                                     | 0.546866    | 0.115595              | 4.730895    | 0.0000    |
| CAP                                   | 0.014137    | 0.021095              | 0.670154    | 0.5063    |
| ME                                    | -0.002956   | 0.000499              | -5.919974   | 0.0000    |
| DFIN                                  | 0.092200    | 0.074020              | 1.245607    | 0.2197    |
| LQ                                    | -0.005962   | 0.009671              | -0.616495   | 0.5408    |
| BSZ                                   | -0.047719   | 0.010522              | -4.535152   | 0.0000    |
| AQ                                    | -0.080707   | 0.058596              | -1.377334   | 0.1755    |
| DPF                                   | -0.061654   | 0.018465              | -3.338926   | 0.0017    |
| EP                                    | 1.25E-07    | 2.20E-08              | 5.694206    | 0.0000    |
| GDP                                   | 0.109719    | 0.064948              | 1.689336    | 0.0984    |
| INF                                   | 0.003425    | 0.005631              | 0.608123    | 0.5463    |
| MKT                                   | -0.077441   | 0.038571              | -2.007756   | 0.0510    |
| Effects Specification                 |             |                       |             |           |
| Cross-section fixed (dummy variables) |             |                       |             |           |
| R-squared                             | 0.863786    | Mean dependent var    |             | 0.040494  |
| Adjusted R-squared                    | 0.813102    | S.D. dependent var    |             | 0.009058  |
| S.E. of regression                    | 0.003916    | Akaike info criterion |             | -8.013902 |
| Sum squared resid                     | 0.000659    | Schwarz criterion     |             | -7.420504 |
| Log likelihood                        | 257.4171    | Hannan-Quinn criter.  |             | -7.781792 |
| F-statistic                           | 17.04251    | Durbin-Watson stat    |             | 1.603622  |
| Prob(F-statistic)                     | 0.000000    |                       |             |           |

## Appendix –II Heteroskedasticity Test: White test results

Heteroskedasticity Test: White

|                     |          |                      |        |
|---------------------|----------|----------------------|--------|
| F-statistic         | 1.213845 | Prob. F(11,48)       | 0.3039 |
| Obs*R-squared       | 13.05799 | Prob. Chi-Square(11) | 0.2896 |
| Scaled explained SS | 17.98708 | Prob. Chi-Square(11) | 0.0819 |

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/02/15 Time: 19:53

Sample: 1 60

Included observations: 60

White Heteroskedasticity-Consistent Standard Errors & Covariance

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | 4.07E-05    | 0.000169   | 0.240356    | 0.8111 |
| CAP^2    | 1.09E-05    | 0.000368   | 0.029710    | 0.9764 |
| ME^2     | -3.32E-07   | 2.00E-07   | -1.655635   | 0.1043 |
| DFIN^2   | 0.017134    | 0.005395   | 3.175685    | 0.0026 |
| LQ^2     | -0.000224   | 0.000106   | -2.102525   | 0.0408 |
| BSZ^2    | -5.09E-07   | 1.57E-06   | -0.324372   | 0.7471 |
| AQ^2     | 0.002372    | 0.002068   | 1.147196    | 0.2570 |
| DPF^2    | 0.000124    | 8.41E-05   | 1.474127    | 0.1470 |
| EP^2     | -2.74E-16   | 1.32E-16   | -2.074156   | 0.0435 |
| GDP^2    | 0.000586    | 0.001624   | 0.360891    | 0.7198 |
| INF^2    | 5.43E-05    | 7.55E-05   | 0.719047    | 0.4756 |
| MKT^2    | -0.000217   | 0.000258   | -0.841240   | 0.4044 |

|                    |          |                       |           |
|--------------------|----------|-----------------------|-----------|
| R-squared          | 0.217633 | Mean dependent var    | 1.95E-05  |
| Adjusted R-squared | 0.038341 | S.D. dependent var    | 4.09E-05  |
| S.E. of regression | 4.01E-05 | Akaike info criterion | -17.23453 |
| Sum squared resid  | 7.71E-08 | Schwarz criterion     | -16.81566 |
| Log likelihood     | 529.0358 | Hannan-Quinn criter.  | -17.07068 |
| F-statistic        | 1.213845 | Durbin-Watson stat    | 2.249213  |
| Prob(F-statistic)  | 0.303929 |                       |           |

### Appendix –III Ratio Analysis

BANK    YEAR    ROA    CAP    ME    DFIN    LQ    BSZ    AQ    DPF    EP    GDP    INF    MKT

|     |      |        |          |          |          |          |          |          |          |          |       |       |        |
|-----|------|--------|----------|----------|----------|----------|----------|----------|----------|----------|-------|-------|--------|
| DB  | 2005 | 0.0283 | 0.071053 | 0.876289 | 0.021053 | 0.315123 | 9.534026 | 0.032258 | 0.828363 | 0.159340 | 0.128 | 0.061 | 0.5055 |
|     | 2006 | 0.0406 | 0.084910 | 0.621622 | 0.027497 | 0.264381 | 9.657629 | 0.026549 | 0.812143 | 0.136667 | 0.120 | 0.106 | 0.4666 |
|     | 2007 | 0.0427 | 0.090217 | 0.519380 | 0.027313 | 0.276610 | 9.781109 | 0.023131 | 0.804668 | 0.135200 | 0.115 | 0.158 | 0.4325 |
|     | 2008 | 0.0424 | 0.093371 | 0.525526 | 0.031933 | 0.372399 | 9.893706 | 0.023277 | 0.785796 | 0.144265 | 0.112 | 0.253 | 0.3994 |
|     | 2009 | 0.0362 | 0.093394 | 0.579545 | 0.032981 | 0.483182 | 9.988247 | 0.022911 | 0.814240 | 0.175281 | 0.097 | 0.364 | 0.3598 |
|     | 2010 | 0.0370 | 0.090909 | 0.562759 | 0.038991 | 0.425418 | 10.09179 | 0.021809 | 0.821196 | 0.161080 | 0.102 | 0.028 | 0.3520 |
|     | 2011 | 0.0429 | 0.095254 | 0.519210 | 0.046284 | 0.424682 | 10.16613 | 0.019889 | 0.807736 | 0.152130 | 0.133 | 0.181 | 0.3986 |
|     | 2012 | 0.0509 | 0.104330 | 0.472265 | 0.047239 | 0.329600 | 10.24351 | 0.021473 | 0.802829 | 0.144439 | 0.086 | 0.341 | 0.3875 |
|     | 2013 | 0.0411 | 0.103595 | 0.632225 | 0.040312 | 0.306927 | 10.29550 | 0.022463 | 0.802710 | 0.192463 | 0.099 | 0.135 | 0.3675 |
|     | 2014 | 0.0595 | 0.118277 | 0.469304 | 0.061715 | 0.297913 | 10.34167 | 0.023975 | 0.805081 | 0.242140 | 0.104 | 0.081 | 0.3754 |
| AIB | 2005 | 0.0247 | 0.102426 | 1.090909 | 0.024708 | 0.389039 | 9.347520 | 0.062016 | 0.871518 | 0.191304 | 0.128 | 0.061 | 0.5055 |
|     | 2006 | 0.0375 | 0.102911 | 0.621622 | 0.030806 | 0.314489 | 9.470410 | 0.049145 | 0.868991 | 0.166670 | 0.120 | 0.106 | 0.4666 |
|     | 2007 | 0.0532 | 0.113316 | 0.377451 | 0.033681 | 0.294517 | 9.583199 | 0.043392 | 0.814660 | 0.135231 | 0.115 | 0.158 | 0.4325 |
|     | 2008 | 0.0423 | 0.123859 | 0.553922 | 0.035685 | 0.380705 | 9.683047 | 0.046384 | 0.802905 | 0.151420 | 0.112 | 0.253 | 0.3994 |
|     | 2009 | 0.0315 | 0.116768 | 0.767327 | 0.031294 | 0.496030 | 9.807730 | 0.054921 | 0.772536 | 0.187783 | 0.097 | 0.364 | 0.3598 |
|     | 2010 | 0.0441 | 0.118313 | 0.515670 | 0.048206 | 0.508874 | 9.900094 | 0.047044 | 0.768534 | 0.176033 | 0.102 | 0.028 | 0.3520 |
|     | 2011 | 0.0499 | 0.129300 | 0.421782 | 0.052689 | 0.400168 | 10.00500 | 0.036352 | 0.765520 | 0.168709 | 0.133 | 0.181 | 0.3986 |
|     | 2012 | 0.0444 | 0.134875 | 0.555556 | 0.037028 | 0.264783 | 10.07689 | 0.027049 | 0.771048 | 0.181961 | 0.086 | 0.341 | 0.3875 |
|     | 2013 | 0.0438 | 0.135339 | 0.726994 | 0.040245 | 0.240393 | 10.17199 | 0.023087 | 0.844269 | 0.221079 | 0.099 | 0.135 | 0.3675 |
|     | 2014 | 0.0470 | 0.143384 | 0.744017 | 0.039941 | 0.380657 | 10.24554 | 0.022750 | 0.668932 | 0.236163 | 0.104 | 0.081 | 0.3754 |
| BOA | 2005 | 0.0398 | 0.123481 | 0.451220 | 0.022882 | 0.368626 | 9.313200 | 0.049433 | 0.790958 | 0.10924  | 0.128 | 0.061 | 0.5055 |
|     | 2006 | 0.0430 | 0.141849 | 0.467213 | 0.019407 | 0.275582 | 9.452399 | 0.031075 | 0.768172 | 0.16760  | 0.120 | 0.106 | 0.4666 |
|     | 2007 | 0.0279 | 0.118669 | 1.284211 | 0.019140 | 0.300942 | 9.530967 | 0.046855 | 0.801237 | 0.16908  | 0.115 | 0.158 | 0.4325 |
|     | 2008 | 0.0051 | 0.098287 | 10.57540 | 0.022253 | 0.337834 | 9.630422 | 0.088948 | 0.814477 | 0.17816  | 0.112 | 0.253 | 0.3994 |
|     | 2009 | 0.0265 | 0.094808 | 1.012027 | 0.023540 | 0.492329 | 9.738512 | 0.098274 | 0.820614 | 0.22514  | 0.097 | 0.364 | 0.3598 |
|     | 2010 | 0.0312 | 0.093790 | 0.739796 | 0.032962 | 0.471815 | 9.797959 | 0.074215 | 0.818312 | 0.23020  | 0.102 | 0.028 | 0.3520 |
|     | 2011 | 0.0355 | 0.090822 | 0.759690 | 0.033800 | 0.397899 | 9.862000 | 0.033320 | 0.834707 | 0.19986  | 0.133 | 0.181 | 0.3986 |
|     | 2012 | 0.0350 | 0.110073 | 0.782007 | 0.027427 | 0.299657 | 9.915900 | 0.025684 | 0.821723 | 0.20653  | 0.086 | 0.341 | 0.3875 |
|     | 2013 | 0.0284 | 0.109389 | 0.078201 | 0.022312 | 0.194590 | 10.00557 | 0.019991 | 0.838780 | 0.20654  | 0.099 | 0.135 | 0.3675 |
|     | 2014 | 0.0464 | 0.135598 | 0.658397 | 0.039996 | 0.243526 | 10.05210 | 0.013586 | 0.806669 | 0.19928  | 0.104 | 0.081 | 0.3754 |
| WB  | 2005 | 0.0389 | 0.111386 | 1.031746 | 0.043317 | 0.383663 | 9.208800 | 0.050898 | 0.797030 | 0.15625  | 0.128 | 0.061 | 0.5055 |
|     | 2006 | 0.0416 | 0.112882 | 0.968085 | 0.044267 | 0.292607 | 9.353900 | 0.048336 | 0.787074 | 0.16756  | 0.120 | 0.106 | 0.4666 |
|     | 2007 | 0.0439 | 0.115805 | 0.732026 | 0.038793 | 0.379310 | 9.541579 | 0.044084 | 0.782759 | 0.16603  | 0.115 | 0.158 | 0.4325 |
|     | 2008 | 0.0460 | 0.146560 | 0.794737 | 0.046545 | 0.437091 | 9.615400 | 0.059225 | 0.719030 | 0.16151  | 0.112 | 0.253 | 0.3994 |
|     | 2009 | 0.0500 | 0.163345 | 0.519531 | 0.046698 | 0.569558 | 9.709000 | 0.061080 | 0.728410 | 0.19122  | 0.097 | 0.364 | 0.3598 |
|     | 2010 | 0.0553 | 0.183211 | 0.540881 | 0.055381 | 0.528736 | 9.759000 | 0.039612 | 0.683211 | 0.16858  | 0.102 | 0.028 | 0.3520 |
|     | 2011 | 0.0568 | 0.165860 | 0.561135 | 0.062027 | 0.513832 | 9.906000 | 0.045361 | 0.738990 | 0.18552  | 0.133 | 0.181 | 0.3986 |
|     | 2012 | 0.0548 | 0.279090 | 0.550218 | 0.048880 | 0.333141 | 9.921500 | 0.024315 | 0.689829 | 0.20328  | 0.086 | 0.341 | 0.3875 |
|     | 2013 | 0.0435 | 0.242363 | 0.719647 | 0.035213 | 0.267077 | 10.01670 | 0.022388 | 0.726444 | 0.23604  | 0.099 | 0.135 | 0.3675 |
|     | 2014 | 0.0356 | 0.255858 | 1.095000 | 0.036380 | 0.159147 | 10.05087 | 0.016699 | 0.745779 | 0.29033  | 0.104 | 0.081 | 0.3754 |
| UB  | 2005 | 0.0400 | 0.116496 | 0.720930 | 0.041938 | 0.451072 | 9.030599 | 0.038786 | 0.806151 | 0.13553  | 0.128 | 0.061 | 0.5055 |
|     | 2006 | 0.0375 | 0.119450 | 0.616667 | 0.034396 | 0.370857 | 9.203840 | 0.028884 | 0.762977 | 0.14432  | 0.120 | 0.106 | 0.4666 |
|     | 2007 | 0.0398 | 0.164911 | 0.747126 | 0.032066 | 0.355474 | 9.339050 | 0.030496 | 0.705909 | 0.15131  | 0.115 | 0.158 | 0.4325 |
|     | 2008 | 0.0387 | 0.144000 | 0.722222 | 0.033538 | 0.426154 | 9.511800 | 0.026882 | 0.751692 | 0.15840  | 0.112 | 0.253 | 0.3994 |
|     | 2009 | 0.0287 | 0.111780 | 0.925373 | 0.029020 | 0.534394 | 9.667640 | 0.030669 | 0.777300 | 0.21252  | 0.097 | 0.364 | 0.3598 |

|     |      |        |          |          |          |          |          |          |          |         |       |       |        |
|-----|------|--------|----------|----------|----------|----------|----------|----------|----------|---------|-------|-------|--------|
|     | 2010 | 0.0420 | 0.108209 | 0.641129 | 0.044098 | 0.555461 | 9.770550 | 0.036343 | 0.801391 | 0.16670 | 0.102 | 0.028 | 0.3520 |
|     | 2011 | 0.0417 | 0.116619 | 0.504644 | 0.037794 | 0.460652 | 9.887950 | 0.027769 | 0.785141 | 0.17141 | 0.133 | 0.181 | 0.3986 |
|     | 2012 | 0.0462 | 0.125413 | 0.556650 | 0.035621 | 0.325822 | 9.943800 | 0.023256 | 0.769091 | 0.18628 | 0.086 | 0.341 | 0.3875 |
|     | 2013 | 0.0306 | 0.120365 | 1.153595 | 0.030567 | 0.206655 | 9.999040 | 0.018680 | 0.808078 | 0.22991 | 0.099 | 0.135 | 0.3675 |
|     | 2014 | 0.0264 | 0.020343 | 1.331537 | 0.027650 | 0.287641 | 10.07060 | 0.014620 | 0.757199 | 0.22930 | 0.104 | 0.081 | 0.3754 |
| NIB | 2005 | 0.0381 | 0.129330 | 0.681818 | 0.030023 | 0.267898 | 9.238540 | 0.041483 | 0.706120 | 0.09910 | 0.128 | 0.061 | 0.5055 |
|     | 2006 | 0.0399 | 0.140602 | 0.580247 | 0.075974 | 0.214603 | 9.306800 | 0.038644 | 0.716330 | 0.13281 | 0.120 | 0.106 | 0.4666 |
|     | 2007 | 0.0406 | 0.163023 | 0.566038 | 0.023399 | 0.266974 | 9.416140 | 0.034122 | 0.720752 | 0.15060 | 0.115 | 0.158 | 0.4325 |
|     | 2008 | 0.0434 | 0.163836 | 0.603774 | 0.029315 | 0.365205 | 9.562290 | 0.037843 | 0.676712 | 0.13795 | 0.112 | 0.253 | 0.3994 |
|     | 2009 | 0.0456 | 0.151654 | 0.602740 | 0.035781 | 0.485542 | 9.681870 | 0.045946 | 0.685667 | 0.15238 | 0.097 | 0.364 | 0.3598 |
|     | 2010 | 0.0477 | 0.153576 | 0.638596 | 0.048568 | 0.513649 | 9.776040 | 0.038885 | 0.691174 | 0.16522 | 0.102 | 0.028 | 0.3520 |
|     | 2011 | 0.0483 | 0.164651 | 0.561047 | 0.045557 | 0.512514 | 9.851990 | 0.041200 | 0.725112 | 0.17989 | 0.133 | 0.181 | 0.3986 |
|     | 2012 | 0.0470 | 0.184630 | 0.560411 | 0.039391 | 0.360198 | 9.917800 | 0.027231 | 0.705413 | 0.19055 | 0.086 | 0.341 | 0.3875 |
|     | 2013 | 0.0428 | 0.182176 | 0.701531 | 0.030727 | 0.246473 | 9.961184 | 0.025094 | 0.727720 | 0.10240 | 0.099 | 0.135 | 0.3675 |
|     | 2014 | 0.0363 | 0.182744 | 0.705882 | 0.026147 | 0.178268 | 10.03130 | 0.025094 | 0.737237 | 0.21174 | 0.104 | 0.081 | 0.3754 |