

**Determinants of Financial Performance: An Empirical Study on  
Ethiopian Commercial Banks**

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## **Abstract**

*This study examines the determinants of financial performance of commercial banks in Ethiopia by using panel data of banks over the period 2002-2013. Since the data is secondary in nature, the quantitative approach to research was considered. Besides, the fixed effect model was used. The fixed effect model is preferred to the random effect model based on the hausman specification test. Under this study, both internal and external factors were included. The internal factors used in this study include capital structure; Income Diversification, operating cost and bank size whereas the external factors are effective tax rate, real GDP growth and inflation. Moreover, ROA and NIM were used as the performance measure. Based on the regression result, all bank specific variables except bank size affect performance of the bank significantly but negatively. However, bank size affects performance significantly and positively. In addition to this, macro-economic factors have no significant effect on the performance of banks except the tax rate which negatively but significantly affects ROA.*

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## **List of acronyms**

AIB: - Awash International Bank

BOA:-Bank of Abyssinia

CBB: - Construction and Business Bank

CBE: -Commercial Bank of Ethiopia

CLRM:-Classical Linear Regression Model

DB: - Dashen Bank

EVA: - Economic Value Added

GDP: - Gross Domestic Product

GMM: - Generalized Method of Moments

MOFED: - Ministry of Finance and Economic Development

NBE: - National Bank of Ethiopia

NI: -Net Income

NIB:-Nib International Bank

NIM: -Net Interest Margin

ROA: - Return On Asset

ROE: -Return On Equity

SCP: - Structure-Conduct-Performance

SSA: - Sub-Saharan Africa

TA:-Total Asset

UB:-United Bank

WB:-Wegagen Bank

## **Chapter one**

### **1. Introduction**

*This chapter begins by presenting brief background of the study which is followed by the statement of the problem. Under the statement of the problem, the study states the reasons to carry out this study. Following the statement of the problem, the general and specific objectives of the study are presented. After that, the next section presents the research hypothesis. Finally, significance of the study, scope and limitation of the study including organization of the paper are presented.*

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

As financial intermediaries, banks play an important role in the operation of an economy. They channel funds from savers to borrower for investment which is an important thing for one's country economic growth. As such, examining the determinants of financial performance of banks is crucial to the stability of the economy.

In banking literature, the determinants of financial performance can be divided into two namely, internal factors and external factors. Internal factors could be controlled by bank management. According to Mohana et al. (2012), the internal factors reflect differences associated to policies and decisions of a bank's management with regard to sources and uses of funds, capital, liquidity and expense management. Furthermore, external factors are beyond the control of the banks management, the environment within which a bank operates and the industry to which it belongs.

A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou *et al.* 2005). Therefore, the determinants of bank performance have attracted the attention of academic research as well as of bank management and bank supervisors. Many studies have inspected the determinants of banks' performance in many countries around the world. For instance, Yadollahzadeh *et al.*

(2013) studied the performance of commercial banks in Iran for nine banks over the period of 2006-2010 by using panel data regression method. The authors used ROA and ROE as dependent variables which are separately examined by explanatory variables including bank size, gearing ratio, nonperforming loans, asset management, operating efficiency and capital adequacy ratio. The research result reveals that the variables of bank size, management efficiency and capital adequacy ratio have a positive effect on the performance of commercial banks while the variables of operating efficiency, gearing ratio and non-performing loans have a negative effect on the performance. In case of Sub Saharan African countries, performance of the bank was affected by both internal and external factors. For example, Ezra (2013) studied the determinants of commercial banks profitability in SSA by using unbalanced panel data of 216 commercial banks taken from 42 countries in SSA for the time period of 1999-2006. Through the cost efficiency model, bank profitability was estimated using panel random effects method in static framework. The independent variables were growth in bank deposit, growth in bank asset, capital adequacy, operational efficiency and liquidity ratio including the external variables such as GDP growth and inflation. The result reveals that both the internal as well as external factors explain variation in commercial bank profitability over the study period. Furthermore, Okoth *et al.* (2013) studies the Determinants of Financial Performance of Commercial Banks in Kenya. The authors used linear multiple regression model and Generalized Least Square on panel data to estimate the parameters. The findings showed that bank specific factors significantly affect the performance of commercial banks in Kenya, except for liquidity variable.

Even though different studies are conducted on the determinants of banks performance, their result is not conclusive as far as the impacts of the factors are concerned. This implies that, there is no consensus in the banking literature regarding the determinants of bank performance.

In Ethiopia, different studies are conducted on the determinants of the commercial bank performance but the authors didn't include important variables like capital structure and effective tax rate as a variable. Since capital structure and effective tax rate are important

variables that affect the performance of Ethiopian banks, this study examines the determinants of bank performance in Ethiopia by including these important variables.

Therefore, the aim of this research is to examine the determinants of financial performance of commercial banks in Ethiopia over the period of 2002-2013. This helps the bank managers to give due emphasis on the management of identified variables and provides them with understanding of activities that enhance their bank performance.

## **1.2. Statement of the Problem**

Commercial Banks play an important role in the economic development of the countries. For instance, they allocate resource and channel funds from savers to investors continuously (Okoth et al. 2013). They do so, if they get necessary earnings to cover their operational cost they incur. That is to say, for sustainable intermediation function, banks need to be gainful.

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

Today it becomes extremely essential for Commercial banks to examine their performance because their survival in the dynamic economic environment will be dependent upon their good performance. So, its wellbeing and successful operation captures the interest of different researchers and other professionals. Thus, a number of studies have examined the determinants of banks' performance in many countries around the world. For instance, Mobeen *et al.* (2011) for Pakistan banks, Nassreddine *et al.* (2013) for Tunisian banks, Okoth *et al.* (2013) for Kenyan banks, Ezra (2013) for SSA banks, Tan et al. (2012) for China banks, Sarita et al. (2012) for Indonesian banks, Dietrich et al. (2009) for Switzerland banks, Sufian (2011) for Korean banks, Sufian et al. (2009) for Bangladesh banks and others undertook studies on financial performance of bank.

Even though a lot of literatures are developed to examine the determinants of banks performance, those studies show different and even contradictory results. For instance, the impact of bank size on banks performance is hotly debated among researchers. While Mohana and Tekeste (2012) for Ethiopian banks, Yadollahzadeh *et al.* (2013) for Iran banks, Nassreddine *et al.* (2013) for Tunisian banks, Masood *et al.* (2012) for Islamic banks, Alkhatib (2012) for Palestine banks have found economies of scale for large banks, Dietrich *et al.* (2009) for Switzerland banks, Birhanu (2012) for Ethiopian banks, Ezra (2013) for sub Saharan African banks have found diseconomies of scale for large banks. Regarding capital structure which is measured by total debt to total equity, different researchers found different results. While Yadollahzadeh *et al.* (2013) for Iran banks found positive impact of capital structure on performance (ROA) but Masood *et al.* (2012) for Islamic banks of different country found negative relationship between capital structure and profitability (ROA).

Furthermore, Since Ethiopian banking sector has shown a rapid progress in terms of number of commercial banks, total assets and capital, widening their branch network, increasing their outreach to remote areas and continuously reporting profits of different magnitude, the examination of the determinants of financial performance is very necessary.

In Ethiopia, studies were made by Belayneh (2011) and Amdemikael (2012) on the determinants of commercial banks profitability. Moreover studies on profitability of private banks were made by Birhanu (2012) and Habtamu (2012) but they didn't include capital structure, Effective tax rate and other important variables that affect profitability. According to Khalaf (2013) Capital structure decision is the vital one since the profitability of an enterprise is directly affected by such decision. A combination of debt and equity that will minimize the firms cost of capital maximizes profitability (A.M.Goyal 2013).Banks that are able to make their financing decisions carefully would have a competitive advantage in the industry and thus makes superior profits. So, this study considers capital structure and other performance determinants in addition to the previous study as a variable that determines banks performance.

In light of the above facts and research gaps, the aim of this study is to examine the determinants of commercial banks performance in Ethiopia for the year 2002-2013.

### **1.3. Objectives**

#### **1.3.1. General objective**

The general objective of this study was to examine the determinants of financial performance of commercial banks in Ethiopia.

#### **1.3.2. Specific objectives**

The specific objectives of the research includes:-

1. To examine the impact of internal factors on commercial banks performance in Ethiopia.
2. To examine the impact of external factors on commercial banks performance in Ethiopia.
3. To assess the relationship between dependent and independent variables.
4. To offer suggestions that improves the financial performance of commercial banks in Ethiopia.

### **1.4. Research Hypotheses**

In order to attain the objective of the study, the null hypotheses are developed based on review of relevant and related literatures on the performance of commercial banks to be tested. Seven testable hypotheses formulated in this study are as follows:-

*H1. Operating cost negatively affects bank performance*

*H2. Capital structure positively affects bank performance*

*H3. Income diversification positively affects bank performance*

*H4. Bank size positively affects bank performance*

*H5. Effective tax rate negatively affects bank performance*

*H6. Gross Domestic Product has a positive impact on bank performance*

*H7. Inflation positively affects bank performance*

## **1.5. Significance of the Study**

This empirical study which deals with the determinants of financial performance of commercial banks in Ethiopia is beneficial for different stakeholders such as for the researcher, Banks managers and executives and for other researchers.

For the researcher, the finding of this study initiate for further research. Moreover, this study initiate the commercial Banks managers and executives to give due emphasis on the management of identified variables and provides them with understanding of activities that enhance their banks performance. Finally, the finding of the study is used as a reference by other researchers; thus, it can minimize the literature gap in the area of the study especially in Ethiopia.

## **1.6. Scope and Limitations of the study**

The scope of this study was restricted to the relationship between Return on Asset and Net Interest Margin with its determinants over the period 2002-2013. Even if there are so many factors such as capital adequacy, asset quality, management efficiency, earning quality, liquidity, bank size, technology, human capital, loan performance, gross domestic product(GDP), bank concentration, inflation, regulation, income diversification, effective tax rate among others that affects commercial banks performance, this study is limited to bank specific factors such as, Capital structure, operating cost, Income diversification and Bank size and external factors like GDP growth, effective tax rate and Inflation rate that determine the financial performance of commercial banks in Ethiopia.

Even if currently nineteen banks are operating in Ethiopia, this study includes eight leading commercial banks that are registered by NBE before 2007/08 namely, Commercial Bank of Ethiopia, Construction and Business Bank, Dashen bank, Awash international bank, Bank of Abyssinia, Wegagen bank, united bank, and Nib international bank.

## **1.7. Organization of the paper**

This study consists of five chapters. Chapter one presents introduction, statement of the problem, objective of the study, hypotheses, scope and limitations and significance of the

study. Chapter Two reviews the most significant theoretical and empirical studies. Chapter three presents methodology of the study. Then chapter four provides the interpretation and analysis of econometric model outcomes and finally, chapter five gives conclusions and recommendations with policy implication and further research direction.

## **Chapter Two**

### **2. Literature Review**

*The previous chapter presents the background, the statement of the problem, objective, hypothesis, scope and significance of the study. This chapter presents the literature related with bank performance. Accordingly, the review of the literature is divided into two parts. The first part discusses the theoretical foundation for the study, while the second part presents a survey of previous studies. Under the theoretical foundation, the overview of the Ethiopian banking industry, economic significance of banks and the factors affecting bank performance is presented. Followed by the review of previous studies done on the performance of commercial banks consists of both single country studies and panel country studies.*

#### **2.1. Ethiopian banking industry**

Bank of Abyssinia which was the first bank of Ethiopia was established in 1905 based on the contract signed between the National bank of Egypt, which was owned by British and Ethiopian Government (Habtamu, 2012). Based on the contract, the bank was allowed to engage in commercial banking (selling shares, accepting deposits and effecting payments in cheques) and to issue currency notes. Moreover, the contract prohibited the establishment of any other bank in Ethiopia, thus giving monopoly right to the Bank of Abyssinia. According to Lakew (2000) cited in Ebisa (2012) the Bank, which started operation a year after its foundation agreement was signed, opened branches in Dire Dawa, Harar, Dembi- Doloand Gore as well as an agency office in Gambela and a transit office in Djibouti. Even though the Bank could not attract deposits from Ethiopian nationals who were not familiar with banking services, it serves foreigners living in Ethiopia and holds government accounts (NBE, 2012).

The Ethiopian government under the rule of Emperor Haile Sellassie, closed the Bank of Abyssinia, paid compensation to its shareholders and with a capital of pound sterling 750,000. Then, Emperor Haile Sellassie established the Bank of Ethiopia which was fully owned by Ethiopians. The Bank started operation in 1932. The shareholders of the Bank of Ethiopia were the Emperor and the political leaders of the time. The Bank was allowed to

combine the task of central banking (issuing currency notes and coins) and commercial banking. The Bank of Ethiopia opened branches in Dire Dawa, Gore, Dessie, Debre Tabor and Harar (NBE, 2012).

The operation of bank of Ethiopia come to an end when Italian occupy Ethiopia (1936-1941), however a number of Italian financial institutions were working in the country. These were Banco Di Napoli, Banca Nazionale del Lavoro and Banco Di Roma. It should also be mentioned that Barclays Bank had opened a branch and operated in Ethiopia during 1942-43.

In 1946 Banque Del Indo chine was opened and functioned until 1963. In 1945 the Agricultural Bank was established but was replaced by the Development Bank of Ethiopia in 1951, which changed in to the Agricultural and Industrial Development Bank in 1970. In 1963, the Imperial Savings and Home Ownership Public Association (ISHOPA) and the Investment Bank of Ethiopia were founded. The later was renamed Ethiopian Development Corporation S.C. in 1965. In the same year, the Savings and Mortgage Company of Ethiopia S.C. was also founded (NBE, 2012).

With the exit of the Italians and the restoration of Emperor Haile Selassie's government, the State Bank of Ethiopia was founded in 1943 with a capital of 1 million Maria Theresa Dollars by a charter published as General Notice No. 18/1993 (E.C). Like that of the bank of Ethiopia, the state bank of Ethiopia also combined the functions of central banking with those of commercial banking by opening 21 branches, including one in Khartoum (the Sudan) and a transit office in Djibouti. In 1963, the State Bank of Ethiopia was divided into the National Bank of Ethiopia and the Commercial Bank of Ethiopia S.C. with the purpose of separating the functions of central banking from those of commercial banking. The new banks started operation in 1964(NBE, 2012).

As stated in NBE (2012), the first privately owned company in banking business established in 1964 was the Addis Ababa Bank S.C., which the share of the bank were owned by Ethiopian shareholders, foreigners living in Ethiopia and the National and Grindlays Bank of London. The Bank carried our typical commercial banking business. Banco Di Roma and Banco Di Napoli also continued to operate. Thus, until the end of 1974, there were state

owned, foreign owned and Ethiopian owned banks in Ethiopia. The banks were established for different purposes: central banking, commercial banking, development banking and investment banking. Such diversification of functions, lack of widespread banking habit among the wider population, the uneven and thinly spread branch network, and the asymmetrical capacity of banks, made the issue of competition among banks almost irrelevant (NBE, 2012).

As stated in NBE (2012), following the declaration of socialism in 1974 the government extended its control over the whole economy and nationalized all large corporations. Thus, the existing private banks and 13 insurance companies were nationalized and along with state owned banks, placed under the coordination, supervision and control of the National Bank of Ethiopia. The three private banks, Banco Di Roman, Banco Di Napoli and the Addis Ababa Bank S.C. were merged and form Addis Bank. Eventually in 1980 this bank was itself merged with the Commercial Bank of Ethiopia S.C. to form the —Commercial Bank of Ethiopia, thereby creating a monopoly of commercial banking services in Ethiopia. In 1976, the Ethiopian Investment and Savings S.C. was merged with the Ethiopian government Saving and Mortgage Company to form the Housing and Savings Bank .The Agricultural and Industrial Development Bank continued under the same name until 1994 when it was renamed as the Development Bank of Ethiopia.

Thus, from 1975 to 1994 there were four state owned banks and one state owned insurance company, i.e., the National Bank of Ethiopia (The Central Bank), the Commercial Bank of Ethiopia, the Housing and Savings Bank, the Development Bank of Ethiopia and the Ethiopian Insurance Corporation (Habtamu, 2012).

According to Ebisa (2012) after the down fall of the Derg regime, there are opportunities to invest in financial institutions with policies encouraging private investors to invest in the banking, MFIs and insurance companies. Although the history of private commercial banks in the country is very short, the banks have managed to contribute their part in provision of banking services and sharing the monopolies enjoyed formerly by the state owned Commercial Bank of Ethiopia (Ebisa, 2012). Accordingly , in Ethiopia the lists of private commercial banks include Awash International Bank, which is the first private commercial

bank in the country and others followed like Dashen Bank, United Bank, Wegagen Bank, Bank of Abyssinia, and Cooperative Bank of Oromia, Lion International Bank, Oromia International Bank, Zemen bank, Bunna International Bank, Nib Bank, Berhan International Bank and others under formation such as Addis cooperative Bank, Hawassa bank, Dehub Global Bank ,Abay bank, and others under formation are included.

Currently, the banking industry of Ethiopia is dominated by the three state owned banks namely, commercial bank of Ethiopia, construction and business bank and development bank of Ethiopia. Due to the existence of these three dominant state owned banks, the private commercial banks play a minimal role in the financial system of the country. However the state owned banks were comparatively inefficient relative to private banks (Ebisa, 2012).

## **2.2. Economic Significance of Banks**

The existence of a strong and effective banking system is very important for the economic development of a country. According to Li yuqi (2007) banks through acceptance of deposit of money from persons who do not need it at the present and lending it to persons who want it for investment, serve as financial intermediaries thereby providing ideal source of fund for investment that is crucial in increasing production, exports, creation of jobs and foreign exchange earnings of the country. Similarly, bank lending to customers who need the money for consummation, purchase of various goods and services, construction of houses, and education increases demand for those goods and services, thereby encouraging producers and service providers to expand their undertakings and increase production (Fasil and Merhatibeb, 2009). Expansion and increase in production requires employment of additional workers, thereby creating new jobs, encourage producers and suppliers of raw materials to increase their production and supply. Banks also play a positive role in encouraging savings by providing an incentive to save through payment of interest on deposits/savings and providing safety and security. Saving is also an important source of future investment and the improvement of the living standards of the society (Wubitu, 2012).

The power of the national bank in fixing interest rates is particularly crucial in both investment and saving. If the rate of interest fixed by the bank on deposits /i.e. the interest

banks pay on money deposited on saving and other accounts / is attractive, it will encourage people to save their money rather than spend it (Fasil and Merhatibeb, 2009). However, such interest should not discourage people from investment and productive activities and turn them to rent collection /potential investors may decide to deposit their money and collect interest. According to (Fasil and Merhatibeb, 2009) if the rate of interest charged by banks on money given on loan to borrowers is lower, it may encourage potential borrowers and investors to borrow and invest, thereby contributing their part in the expansion and increase of production of goods and services, creation of employment opportunities, increase in exports and foreign exchange earnings of the country. The existence of a network of banks covering all parts of a country facilitates business transactions in the country by making payments easier, safer and cheaper. Payment through banks also avoids the risk of loss or theft of money.

### **2.3. Factors Affecting Banks Performance**

Different studies undertaken on the performance of banks suggest that banks performance is affected by both internal and external factors (Nassreddine *et al.* 2013; Okoth *et al.* 2013; Ezra ,2013) and these factors affect the performance of banks positively or negatively. Nassreddine et al. (2013) stated that some of the factors that affect the performance of the bank could be under the control of banks management and the others could be beyond management's control.

Those factors which could be under the control of the management are called internal or bank specific factors. According to Mohana *et al.* (2012) they are so called bank specific factors because depending on the likely impact they have on the profitability of the bank they can be reinforced (positive treatment) or weakened (negative treatment) by the management of the bank. The major internal factors that affect performance of banks include: capital structure, asset quality, management efficiency, earning quality, liquidity, bank size, technology, human capital, loan performance and income diversification among others.

Moreover, those factors which are beyond the management's control are referred as external or macroeconomic factors and these factors are related to the industry and macroeconomic

factors. These factors include: bank concentration, inflation, real GDP growth, effective tax rate, interest rate, among others.

## **2.4. Measures of Bank Performance**

Studies made on the performance of banks largely used ROA, ROE and NIM as a common measure (Ezra, 2013).

### **2.4.1. Return on Asset**

The ROA reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities. This is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that bank owns (Tan et al. 2012).

### **2.4.2. Return on Equity**

Return on equity is the return to shareholders on their equity. This means that, return on equity reflects the capability of a bank in utilizing its equity to generate profits (Tan et al. 2012). According to Dietrich et al. (2009), banks with a lower leverage ratio (higher equity) report a higher ROA, but a lower ROE. However, the ROE disregards the higher risk that is associated with a higher leverage. Even if ROE is commonly used in different studies, it is not the best measure of profitability (Ghazouani et al. 2013).

### **2.4.3. Net interest margin**

Net Interest Margin is defined as the difference between the interest income less interest expense divided by total loan and advances. According to Okoth et al. (2013), NIM reflects the cost of banks intermediation services and the efficiency of the bank. The higher the net interest margin, the higher the profit earned by the bank and the more stable the bank is.

However, according to Khrawish (2011) cited in Okoth *et al.* (2013), a higher NIM could reflect riskier lending practices associated with substantial loan loss provisions.

## **2.5. Review of Empirical studies**

This section gives a brief review of the previous studies made on the determinants of bank performance from both developed and developing nations. Thus, empirical works done on the determinants of bank performance have focused on either a panel of countries (Masood *et al.*, 2012; Demirguc-Kunt *et al.*, 1999; Sufian *et al.*, 2009 ;Ezra ,2013; Goddard *et al.* 2004;M.Bashir ,2003) or on an individual country (Athanasoglou *et al.*, 2005 ; Kumbirai and Webb ,2010; Tan and Floros, 2012 ; Yadollahzadeh *et al.*, 2013 ;Dietrich *et al.*, 2009 ;Gul *et al.*, 2011 ;Sufian *et al.* ,2009; Okoth and Gemechu ,2013 ;Ghazouani *et al.* ,2013 ;B.S. Badola *et al.* ,2006) ; Dinh ,2013; Alkhatib ,2012) .Moreover, most of the studies undertaken on bank performance consider both internal and external factors to examine performance of banks. So, the determinants of bank performance studies conducted in a single country, panel country and studies made in Ethiopia related to bank performance are reviewed as follows.

### **2.5.1. Single country studies**

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

least during the period under consideration. Also, the SCP hypothesis is not verified, as the effect of industry concentration on bank profitability was found insignificant.

B.S. Badola *et al.* (2006) made an attempt to identify the key determinants of profitability of public sector banks in India. The analysis is based on step-wise multivariate regression model used on temporal data from 1991-92 to 2003-04. The study has brought out that the explanatory power of some variables is significantly high. Such variables include non interest income (NII), operating expenses (OE), provision and contingencies (P&C) and Spread. However, some variables namely credit/deposit ratio, NPAs and business per employee (BPE) are found with low explanatory power. Hence, the variables non-interest income, operating expenses, provision and contingencies and spread have a significant relationship with net profit. Among them two variables P&C and OE are found having negative relationship. Based on the result they conclude that control over non-performing assets, operating expenses, provision and contingencies are major areas of concern for the management of public sector banks.

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

The objective of the study made by Anna P.I. Vong *et al.*, (2008) was to examine the contribution of bank-specific as well as macroeconomic and financial structure factors to the variation in profitability across banks and over time in Macao by Utilizing bank level data for the period 1993-2007. They adopt the panel data regression to determine the important factors in achieving high profitability by using internal variables such as capital ratio, asset composition, fund source, asset quality, expense management, fee based services, tax and

market share including external variables like GDP growth rate, real interest rate and inflation. They use ROA as a profitability measure. Their results reveal that capital strength of a bank positively affects profitability. On the other hand, the asset quality, as measured by the loan-loss provisions, affects the performance of banks adversely. In addition, banks with a large retail deposit-taking network do not achieve a level of profitability higher than those with a smaller network. Finally, with regard to macroeconomic variables, only the rate of inflation reveals a significant relationship with banks' performance.

Dietrich *et al.* (2009) examined how bank-specific characteristics, macroeconomic variables and Industry-specific factors affect the profitability of 453 commercial banks in Switzerland over the time period from 1999 to 2006. According to Dietrich *et al.* (2009), this is the first econometric study that has examined the important issue of the determinants of the banking profitability for the Swiss banking market. Besides, this study incorporates the influence of previously ignored factors such as, the growth of a bank's loans relative to the growth rate of the market, the share of interest income relative to total income, the effective tax rate, bank age or the yearly change of regional population in the regression model. They found that better capitalized bank seem to be more profitable. Also, in case that a bank's loan volume is growing faster than the market, the impact on bank profitability is positive. Looking at the effect of the share of interest income at total income, they found that banks with a higher interest income share are less profitable. Bank age does not have an impact on bank profitability. As to the geographic distribution, banks in the Lake Geneva region, which is the second most important banking area in Switzerland, are slightly more profitable than banks in the Zurich region. Looking at the ownership variables, foreign banks are clearly less profitable than Swiss owned banks. Similarly, privately owned institutions have a slightly higher profitability compared to state-owned banks. GDP growth affects the bank profitability positively, and the effective tax rate and the market concentration rate, which both have a significantly negative impact on bank profitability.

The objective of the study made by Alexiou *et al.* (2009) was to identify the crucial factors that affected the profitability of the six major Greek commercial banks by using Panel data analysis over the period 2000– 2007 . In this case, ROA and ROE were the dependent

variables while bank capital, credit risk, bank size, liquidity risk, operating cost, inflation rate, interest rate, GDP, private consumption and investment were the independent variables. Macroeconomic factors such as inflation and private Consumption appear to play a significant role in shaping the performance of banking institutions. Additionally, bank-specific variables, such as capital or measures of cost-efficiency, also play a critical role in determining bank profitability.

Sufian *et al.* (2009) made study to examine the performance of 37 Bangladeshi commercial banks between 1997 and 2004 by using an unbalanced bank level panel data. They found that bank specific characteristics, in particular loans intensity, credit risk, and cost have positive and significant impacts on bank performance, while non-interest income shows negative relationship with bank profitability. Regarding bank size results suggest that it is not uniform across the various measures employed. The empirical findings suggest that size has a negative impact on return on average equity (ROAE), while the opposite is true for return on average assets (ROAA) and net interest margins (NIM). Regarding the impact of macroeconomic indicators, they conclude that the variables have no significant impact on bank profitability, except for inflation which has a negative relationship with Bangladesh banks profitability.

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

The study made by Gul *et al.* (2011) examined the relationship between bank specific and macro-economic characteristics of bank profitability by using data of top fifteen Pakistani commercial banks over the period 2005-2009. They used the pooled Ordinary Least Square (OLS) method to investigate the impact of assets, loans, equity, deposits, economic growth, inflation and market capitalization on major profitability indicators i.e., return on asset (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin

(NIM) separately. The empirical results have found strong evidence that both internal and external factors have a strong influence on the profitability.

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

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

Lamarana (2012) examines the performance of the Malaysians local banks and foreign banks and compares their profitability in the financial sector. This comparative study aims to investigate the factors influencing bank profitability in Malaysia for the period 2005-2011 covering 16 major commercial banks (8 locally owned and 8 foreign owned).he use ROA and ROE as a dependent variable. On the other hand, capital adequacy, asset quality, management

efficiency, liquidity and bank size are the independent variables. The researcher use regression analysis to the panel data. The comparison between the two categories of ownership indicates that foreign banks are more profitable than domestic banks.

Tan and Floros (2012) took a sample of 101 banks (five state owned banks,12 joint-stock commercial banks and 84 city commercial banks) to examine the determinants of bank profitability in China for the period of 2003-2009 by using unbalanced bank level panel data. They examine the effects of inflation on bank profitability, while controlling for comprehensive bank-specific and industry-specific variables. They use ROA and NIM as a dependent variable. The study indicated that there is a positive relationship between bank profitability, cost efficiency, banking sector development, stock market development and inflation in China. The authors report that low profitability can be explained by higher volume of non-traditional activity and higher taxation.

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

Weersainghe and Ravinda (2013) examined the impact of bank specific such as Bank Size, Liquidity Risk, and Operating Cost, Capital adequacy, Credit Risk and macroeconomic determinants like GDP growth rate and Interest Rate on the profitability of commercial banks in Sri Lanka by using quarterly data relating to the bank specific and macroeconomic indicators during the period 2001-2011 and carrying out a multiple panel regression. Moreover, they used ROA and ROE as profitability indicator. According to the empirical results, it was observed that the large banks are recorded more profits due to economic of scale than the banks which are well sound with a higher regulatory capital ratio. Further, the

results from the panel regression suggest that the liquidity and operating cost efficiency banks were negatively related to the commercial banks profitability in Sri Lanka. In addition, interest rate found to be having a significant impact on the bank profitability with a negative relationship between the Return on Assets of a bank.

By using linear multiple regression model and Generalized Least Square on panel data, Okoth and Gemechu (2013) studied the determinants of financial performance of commercial banks in Kenya for ten years from 2001 to 2010. They used independent variables like capital adequacy, asset quality, Management Efficiency, Liquidity Management, GDP Growth Rate, and Inflation Rate and ROA, ROE, and NIM, as a dependent variable. They found that bank specific factors significantly affect the performance of commercial banks in Kenya, except for liquidity variable. But the overall effect of macroeconomic variables was inconclusive at 5% significance level. The moderating role of ownership identity on the financial performance of commercial banks was insignificant.

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

The study made by Dinh (2013) examines the determinants of foreign bank profitability and makes a comparison on performance of foreign banks and domestic banks using the fixed effects method. The sample is an unbalanced panel data set of 51 commercial banks operating in Vietnam from 2000 to 2012. He use ROA and NIM as a dependent variable and ratio of overhead costs, short term customer funding, equity, loans, loan loss provision and other income, to total assets; and total assets to the whole banking total assets, GDP growth rate, the inflation rate, the depth of the financial sector and institutional quality as explanatory variable. He argues that foreign bank profitability is influenced significantly by all bank specific factors, macro-economic factors and multinational bank indicators. He found that total assets and other income have positive impact on profitability. Moreover, parent bank profitability indicates significant and negative influence on foreign bank profitability. Besides, foreign banks perform better than domestic banks due to their ownership advantage.

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

### **2.5.2. Panel country studies**

Demirguc-Kunt and Huizinga (1999) Using bank level data for 80 countries in the 1988-1995 period, they show that differences in interest margins and bank profitability reflect a variety of determinants: bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators. Controlling for differences in bank activity, leverage, and the

macroeconomic environment, they found that a larger bank asset to GDP ratio and a lower market concentration ratio lead to lower margins and profits. Moreover, foreign banks have higher margins and profits compared to domestic banks in developing countries, while the opposite holds in developed countries. Also, there is evidence that the corporate tax burden is fully passed on to bank customers.

M.Bashir (2003) undertook study to analyze how bank characteristics and the overall financial environment affect the performance of Islamic banks. Utilizing bank level data, the study examines the performance indicators of Islamic banks across eight Middle Eastern countries between 1993 and 1998. A variety of internal and external banking characteristics were used to predict profitability and efficiency. In general, his analysis of determinants of Islamic banks' profitability confirms previous findings. Controlling for macroeconomic environment, financial market structure, and taxation, the results indicate that high capital-to-asset and loan-to-asset ratios lead to higher profitability. The results also indicate that foreign-owned banks are likely to be profitable. Everything remaining equal, the regression results show that implicit and explicit taxes affect the bank performance and profitability negatively while favorable macroeconomic conditions impact performance measures positively. His results also indicate that stock markets and banks are complementary to each other.

The profitability of European banks during the 1990s is investigated by Goddard *et al.* (2004) using cross-sectional, pooled cross-sectional time-series and dynamic panel models. They use cross-sectional and dynamic panel estimation to investigate selected determinants of profitability in six major European banking sectors: Denmark, France, Germany, Italy, Spain and the UK, for the period 1992–98. Models for the determinants of profitability incorporate size, diversification, risk and ownership type, as well as dynamic effects. Despite intensifying competition there is significant persistence of abnormal profit from year to year. The evidence for any consistent or systematic size–profitability relationship is relatively weak. The relationship between the importance of off-balance-sheet business in a bank's portfolio and profitability is positive for the UK, but either neutral or negative elsewhere. The relationship between the capital–assets ratio and profitability is positive.

Sufian et al. (2009) uses a sample of 389 banks in 41 SSA countries to study the determinants of bank profitability from 1998 through 2006. Their study is based on an unbalanced panel of SSA commercial banks. They use the return on assets (ROA) as a measure of bank profitability. They use independent variables namely, credit risk, activity mix, capital, bank size, market power, GDP growth and inflation. They found that apart from credit risk, higher returns on assets are associated with larger bank size, activity diversification, and private ownership. Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion. The results also indicate moderate persistence in profitability. Causation in the Granger sense from returns on assets to capital occurs with a considerable lag, implying that high returns are not immediately retained in the form of equity increases. Thus, the paper gives some support to a policy of imposing higher capital requirements in the region in order to strengthen financial stability.

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

Ezra (2013) undertake study on the determinants of commercial banks profitability in sub-Saharan Africa using an unbalanced panel of 216 commercial banks drawn from 42 countries in SSA for the period 1999 to 2006. He employed the random effect panel methods to estimate bank profitability. Growth in bank asset, growth in bank deposit, capital adequacy, operational

efficiency, liquidity ratio, growth in GDP and inflation are an explanatory variable. The findings show that the bank level variables such as capital adequacy and growth in bank deposits have positive influence on bank profitability. According to the study, Positive growth of in these indicators could be results of banking sector liberalization that has been implemented in most of SSA countries since 1980s and 1990s. on the other hand, growth in bank assets, operational efficiency and bank liquidity indicators have negative effect on bank profitability. The negative effect of these indicators could be explained by disproportionate accumulation of assets through merger and acquisitions of foreign based banks at high costs that has occurred in SSA in the last two decades. On the other hand, negative effect of bank liquidity can be explained by low bank lending. For macro-economic variables, Francis M.E found that both growth in GDP and inflation had a negative effect on bank profitability.

### **2.5.3. Review of previous studies on Ethiopia**

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

The study carried out by Mohana *et al.* (2012) was to explore the key determinants of profitability of commercial banks operating in Ethiopia by using unbalanced panel data set of banks over the period 1999/00-2008/09. They used internal factors like capital adequacy, liquidity, credit risk, loan portfolio, asset quality, and expense management and external factors related to the industry and the macroeconomic factors within which the banks operate. Moreover ROAA was used as dependent variable. In their analysis the fixed effects model is used to control the unobservable bank specific characteristics. The result of the study reveals

that Capital adequacy (equity to asset ratio), diversification (non-interest income to total income) and bank size (log of total assets) are among the internal factors that have positive and significant impact on the profitability of Ethiopian commercial banks. Moreover, the loan loss reserve to total loans is also found to have negative impact on profitability though it is statistically insignificant. In addition to this, liquidity and operational efficiency are among the internal factors that negatively affect the profitability of the banks. Finally, the macroeconomic factors have insignificant impact on the commercial banks profitability in Ethiopia.

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

The main objective of the study made by Birhanu (2012) is to examine the effect of bank-specific, industry-specific and macroeconomic determinants of Ethiopian commercial banking industry profitability from the period 2000 – 2011 by using OLS estimation method to measure the effects of internal and external determinants on profitability in terms of average return on asset and net interest margin. The result reveals that, all bank-specific determinants, with the exception of bank size, expense management and credit risk, affect bank profitability significantly and positively in the anticipated way. However, bank size, expense management and credit risk affect the commercial banks profitability significantly and negatively. In

addition to this, no evidence is found in support of the presence of market concentration. Finally, from macroeconomic determinants GDP has positive and significant effect on both asset return and interest margin of the bank. But interest rate policy has significant and positive effect only on interest margin.

Amdemikael (2012) carried out study to examine the bank-specific, industry-specific and macro-economic factors affecting bank profitability for eight commercial banks operating in Ethiopia, covering the period of 2000-2011. He adopts a mixed research approach by combining documentary analysis and in-depth interviews. He used ROA as a dependent variable and capital strength, operational efficiency, income diversification, liquidity risk, bank size, asset quality, industry concentration level, real GDP growth and inflation as independent variables. The findings of the study show that capital strength, income diversification, bank size and gross domestic product have statistically significant and positive relationship with banks' profitability. On the other hand, variables like operational efficiency and asset quality have a negative and statistically significant relationship with banks' profitability. However, the relationship for liquidity risk, concentration and inflation is found to be statistically insignificant.

## **2.6. Conclusion and knowledge gap**

From the review of the relevant literature relating to the determinants of bank performance, it's possible to see the existence of knowledge gap. Even though studies were undertaken by Belayneh (2011), Amdemikael (2012), Birhanu (2012), Habtamu (2012) and Mohana et al. (2012), on the determinants of Ethiopian banking performance, they all fails to include the important variables like capital structure and effective tax rate. Because these variables are very important variables which can significantly affects the performance of Ethiopian banking industry.

Besides ,the growth and development of the Ethiopian banking industry in terms of number of commercial banks, total assets and capital ,branch network, increasing their outreach to remote areas and continuously reporting profits of different magnitude necessitate the examination of the determinants of bank performance in Ethiopian banking industry.

In addition, a lot of literatures are developed to examine the determinants of banks performance but those studies show different and even contradictory results. This shows that there is no consensus in the banking literature on the determinants of bank performance.

## Chapter three

### 3. Research Design and Methodology

*In this chapter, the researcher concentrates on the methods that were adopted throughout the study to accomplish the research objectives. It includes the research design adopted to examine the determinants of financial performance, the type of data used and the sampling design employed to collect the data, the methods employed to analyze the data and the model specifications.*

#### 3.1. Research Design

To achieve the objective of this study, Explanatory research design was adopted. Besides, this study used quantitative research approach to examine a stated objective. Because quantitative research is the systematic and scientific investigation of quantitative properties and phenomena and their relationships (Abiy, 2009),

Under this study, panel data from the year 2002- 2013 was used. This is because panel data has the advantage of giving more informative data as it consists of both the cross sectional information, which captures individual variability, and the time series information, that captures dynamic adjustment.

#### 3.2. Data Source and collection Methods

Secondary data was used to examine the determinants of bank performance. According to Stewart and Kamins (1993) cited in Li Yuqi (2007), secondary data have its own advantages. Compared to primary data, secondary data gives higher quality data, the feasibility to conduct longitudinal studies and the permanence of data which means secondary data generally provide a source of data that is both permanent and available in a form that may be checked relatively easily by others. Therefore, increases the dependability of the data.

The data for the bank specific factors was obtained from audited financial statements, i.e. from balance sheet and income statement of the respective banks. Thus, the data for the bank

specific factors were collected from National Bank of Ethiopia (NBE) and from the respective commercial banks. But for the external factors, the data was obtained from Ministry Of Finance and Economic Development of Ethiopia (MoFED).

The study included eight commercial banks of which two are state owned and the rest are private banks. Consequently, this study used panel data of eight commercial banks for twelve years (96 observations).

### **3.3. Sampling Design**

This study includes all banks operating in Ethiopia as a population of the study. However, banks that operate less than twelve years was not taken since those banks have no experience and have no data for twelve years. Due to this, from 19 banks operating in Ethiopia, by using purposive sampling technique this study takes eight banks namely, commercial bank of Ethiopia, Construction and business bank, Dashen bank, Awash international bank, Bank of Abyssinia, Wegagen bank, United bank and Nib international bank that were registered by NBE before 2007/08. Among these eight banks two banks namely, commercial bank of Ethiopia and construction and business bank were state owned banks. Since these banks have experienced banks, it's possible to make generalization from sample to population.

### **3.4. Data Analysis**

The objective of this study is to examine the determinants of bank performance in Ethiopia. To achieve this objective the study used panel data of eight banks for twelve years. The researcher used panel data because by combining time series of cross section observations, panel data give more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency (Gujarati,2004). By using STATA version12 software, the collected panel data was analyzed using the descriptive statistics, correlation matrix and multiple regressions. In case of the descriptive statistics, the mean, standard deviation, maximum and minimum values were used to analyze the trends of the data while the correlation matrix was used to show the relationship exist between the variables used in the study. Moreover, the diagnostic tests were undertaken in order to check the validity of the

model and fulfill the assumption of the Classical Linear Regression Model. To this end, the study used the fixed or the random effects models and the Hausman specification test was used to choose the appropriate model for this study.

### 3.5. Model Specification

This study used explanatory variable like capital structure, operating cost, income diversification, bank size, effective tax rate, real GDP growth and inflation rate while the dependent variables are ROA and NIM.

In this study, panel data was used. As noted in Brooks (2008), a panel keeps the same individuals or objects and measures some quantity about them overtime. The regression model for the panel data is described in the following equation as adopted from Brooks (2008):

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$$

Where:

$Y_{it}$  is the dependent variable

$\alpha$  is the intercept term

$\beta$  is a  $K \times 1$  vector of parameters to be estimated on the explanatory variables

$X_{it}$  is a  $1 \times K$  vector of observations on the explanatory variables,  $t=1 \dots T; i=1, \dots, N$ .

$\varepsilon_{it}$  is the normal error term.

In this study, the performance of the bank is measured using the ROA and NIM. The bank specific variables of the study includes capital structure, operating cost, income diversification and bank size while the macroeconomic factors were real GDP growth, inflation rate and effective tax rate.

The model used in this study was as follows;

$$ROA = \alpha + \beta_1(cst)_{it} + \beta_2(opcost)_{it} + \beta_3(size)_{it} + \beta_4(incdiv)_{it} + \beta_5(GDP)_{it} + \beta_6(infl)_{it} + \beta_7(tax)_{it} + \varepsilon_{it}$$

$$NIM = \alpha + \beta_1(cst)_{it} + \beta_2(opcost)_{it} + \beta_3(size)_{it} + \beta_4(incdiv)_{it} + \beta_5(GDP)_{it} + \beta_6(infl)_{it} + \beta_7(tax)_{it} + \varepsilon_{it}$$

Where: -

ROA<sub>it</sub>=Return on Asset for bank i in year t

NIM<sub>it</sub>=Net Interest Margin for bank i in year t

Cst<sub>it</sub>= capital structure for bank i in year t

Opcost<sub>it</sub>=operating cost for bank i in year t

Size<sub>it</sub>=bank size for bank i in year t

incdiv<sub>it</sub>=income diversification for bank i in year t

GDP<sub>it</sub>=real GDP growth for bank i in year t

infl<sub>it</sub>=inflation rate for bank i in year t

tax<sub>it</sub>=effective tax rate for bank i in year t

$\beta_1$ - $\beta_7$ =the coefficient of the explanatory variables

$\varepsilon_{it}$ =the error term

### **3.6. Study variables**

#### **3.6.1. Dependent variable**

Bank performance is usually measured by ROA, ROE or NIM. Studies conducted on the determinants of banks performance use one or a combination of these ratios as a measure of performance in their analysis. According to Mohana *et al.* (2012), the choice of the financial performance ratios (ROA, ROE, NIM) depends on the objective of the performance measure since the output of each of the performance measure differs.

##### **3.6.1.1. Return on Asset (ROA)**

The ROA reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities. This is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that bank owns (Tan *et al.* 2012).ROA is the most comprehensive accounting measure of a bank's overall performance (Birhanu 2012). Because of this, the bulk of studies employed ROA as

performance measure, for instance, (Amdemikael2012, Belayneh 2011, Mohana *et al.* 2012, Li Yuqi 2006, Sufian 2011, syafri 2012).

$$\text{ROA} = \frac{\text{Net income}}{\text{Total asset}}$$

#### 3.6.1.2. Net interest margin

Net Interest Margin is defined as the difference between the interest income less interest expense divided by total loan and advances. According to Okoth *et al.* (2013), NIM reflects the cost of banks intermediation services and the efficiency of the bank. The higher the net interest margin, the higher the profit earned by the bank and the more stable the bank is. However, according to Khrawish (2011) cited in Okoth *et al.* (2013), a higher NIM could reflect riskier lending practices associated with substantial loan loss provisions.

This study examined financial performance of banks by using return on asset (ROA) and net interest margin (NIM) as a dependent variable. Studies that employed ROA and NIM as performance measure includes; Tan *et al.* (2012), Gul *et al.* (2011), Ezra (2013), Okoth *et al.* (2013), Kosmidou *et al.* (2006).

$$\text{NIM} = \frac{\text{net interest income}}{\text{Total loan and advances}}$$

#### 3.6.2. Independent Variables

Banks performance is affected by both internal and external factors. Internal factors are factors over which banks management has control whereas external factors are factors over which the management of the bank lacks control.

For the purpose of this study seven independent variables are included. From these seven variables four variables are internal and the remaining three are external factors assuming that they best explain the determinants of bank performance.

## Internal factors

An internal factor that is called the bank specific factors is determinants that are mainly influenced by a bank's management and policy objectives. That is, according to Mohana et al. (2012), the bank specific factors reflect the difference related to policies and decisions of a bank's management. Such performance determinants are capital structure, bank size, income diversification and operating costs which are derived from balance sheet and income statement.

### Bank size

Bank size is a natural logarithm of total assets. It assesses whether the size of the bank is related to performance. The impact of size on bank performance is strongly debated among researchers. In their study, Athanasoglou et al. (2005) and Kosmidou et al. (2006) shows the negative effect of bank size on performance. The authors point out that, the more a bank size is, the more difficult it is to manage. In contrast, Alkatib(2012),Yadollahzadeh *et al.* (2013),Weersainghe *et al.* (2013), Sufian *et al.* (2009), Hadad (2013), Masood *et al.* (2012) and Flamini et.al (2009) found a positive impact of bank size on performance. In their study they conclude that a large bank size reduces costs due to economies of scale that this entails, large banks can also raise capital at a lower cost.

### Income diversification

Income diversification is other alternative means of income other than earning from loans. It includes fees earned from offering unit trust services, service charge on deposit account, standard fees, and charges for other bank services (Birhanu, 2012).

Income diversification is calculated as the percentage of the bank's income other than interest income to its total income. This ratio reflects how well the bank has diversified its source of income. A high ratio of this would mean that the bank is performing better in terms of diversifying its activities to increase its income and thereby affect the profitability of the bank favorably (Mohana et al., 2012).

According to Birhanu (2012), the profitability of banks which depends on only interest income is highly affected by interest fluctuation and loan default risk. But banks which diversify their income source can increase their profit since non-interest income never affected by interest fluctuation and loan default.

Sufian (2011) and Flamini *et al.* (2009), found positive relationship between income diversification and bank performance suggesting that banks which derived a higher proportion of their income from non interest sources tend to report a higher level of profitability level. In contrast, Tan *et al* (2012), Sufian *et al.* (2009) and Hassan *et al.* (2003) found negative relationship. According to the authors, the banks which obtain a higher proportion of their income from source other than interest income such as fee-based services tend to report a lower profitability. Income diversification can be measured as;

$$\text{Income diversification} = \frac{\text{Non interest income}}{\text{Total income}}$$

### Capital structure

Capital structure is the combination of debt & equity that make the total capital of firms. The proportion of debt to equity is a strategic choice of corporate managers (Khalaf, 2013). According to Muzaffar (2013) financial managers are facing difficulties in precisely determining the optimal capital structure. Optimal capital structure means with a minimum weighted average cost of capital and thus maximize the value of organization. Yadollahzadeh *et al.* (2013) found that there was negative relationship between capital structure and bank performance. As the author pointed out, an increase in the total debt was associated with a decrease in performance of banks. This is explained by the fact that debts were relatively more expensive than equity and therefore employing higher proportion of them could lead to low profitability. Capital structure is calculated as;

$$\text{Capital structure} = \frac{\text{Debt}}{\text{Equity}}$$

## Operating cost

Operating cost is defined as the cost to income ratio such as the administrative costs, staff salaries and property costs, excluding losses due to bad and non-performing loans over total generated revenues. It is used to measure the impact of efficiency on bank performance. According to Athanasoglou *et al.*(2008), Dietrich (2009) and Sufian (2011) efficient cost management is a prerequisite for the improved performance of banking sector i.e., the high elasticity of performance of this variable indicates that banks have much to gain if they improve their managerial practices. Most authors such as Athanasoglou *et al.* (2005), Kosmidou *et al.* (2006), Yadollahzadeh *et al.* (2013), Weersainghe *et al.* (2013) and Alkhatib (2012) found negative relationship between operating cost and bank performance. It can be calculated as;

$$\text{Operating cost} = \frac{\text{Total expenses}}{\text{Revenue}}$$

## External factors

External factors are variables that reflect the economic and legal environments where the financial institutions operate. They represent events outside the influence of the bank. The management can anticipate changes in the external environment and try to position the institution to take advantage of anticipated developments (Anna p.I Vong, 2008).

## Real GDP Growth

GDP is one of the measures of economic growth for a countries economy which is measured in terms of the monetary value of all goods and services produced within the borders of a country during a year. Similarly ,if GDP is growing faster than the population growth rate, average household incomes should be rising and the rate of poverty is declining and the society should gradually have more resources to invest in vital social services and infrastructure.

GDP has a positive impact on the performance of banks. According to Nassreddine *et al.* (2013) a period of high growth leads to higher investment and consumption, which increased the credit, and hence increase the performance of banks.

## Inflation

Inflation is an increase in the average level of prices and a price is the rate at which money is exchanged for a good or services. Particularly, when inflation is high and unexpected it can be very costly to an economy. At the same time, inflation generally transfers resources from lender and savers to borrowers, because borrowers can repay their loans with birr that are worth less.

It is foreseen that the extent to which inflation affects bank profitability depends on whether future movements in inflation are fully anticipated, which, in turn, depend on the ability of firms to accurately forecast future movements in the relevant control variables. An inflation rate that is fully anticipated increases profits as banks can appropriately adjust interest rates in order to increase revenues, while an unexpected change could raise costs due to imperfect interest rate adjustment (Ezra, 2012).

## Effective tax rate

The effective tax rate, defined as taxes paid divided by before-tax profits, reflects the explicit taxes paid by the banks. Taxes have a direct impact on a bank's profitability: The higher the tax rate levied, the lower the post-tax profit.

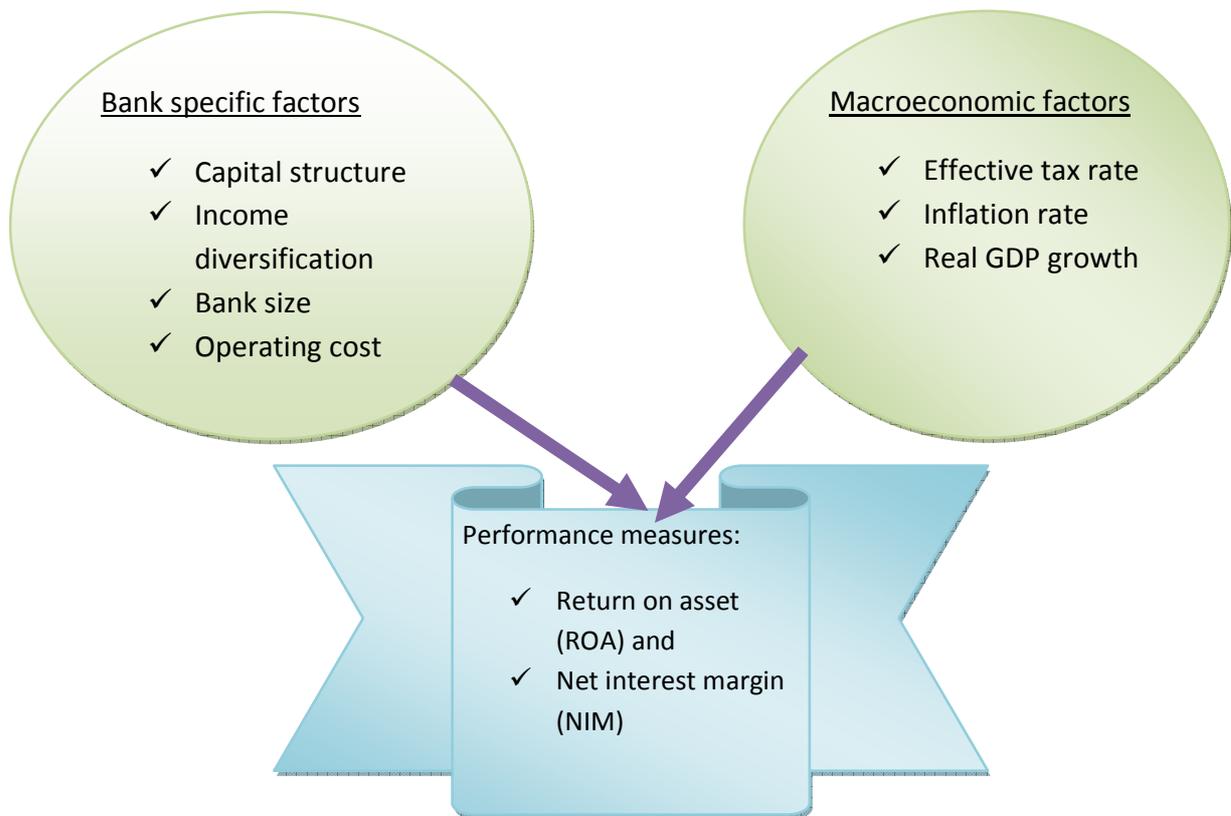
According to Tan and Floros (2012), although the tax rate on corporate profits is not a choice for banks, yet, the bank management should be able to allocate its portfolio to minimize its tax. Since consumers face an inelastic demand for banking services, most banks are able to pass the tax burden to the consumers. If a positive relationship exists between the tax variable and the profitability, it implies that the bank is able to pass the tax cost on to its customers by increasing the fees and the interest spread.

$$\text{Effective tax rate} = \frac{\text{TAX}}{\text{Operating income before tax}}$$

### 3.7. Conceptual framework

To fulfill the objective of this study both bank specific and macroeconomic factors were considered. Thus, the relationship between bank performance and its determinants are as follows:

Figure 3.1. Conceptual framework of the study



Source: Self extracted

## CHAPTER FOUR

### 4. DATA ANALYSIS AND PRESENTATION

*This chapter deals with the analysis and presentation of the results of the study. The data were analyzed by using STATA software version 12. The descriptive statistics and the correlation analysis were discussed. Followed by the diagnostic test, which is necessary to fulfill the assumption of the classical linear regression model. Then, econometric analysis and discussion of the main finding of the study were presented. Finally, the results of the regression analysis were discussed by supporting empirical evidence.*

#### 4.1. Descriptive statistics

This section presents the descriptive statistics of dependent and independent variables used in the study for the sample banks. The dependent variables used in the study were ROA and NIM while the independent variables were capital structure, bank size, income diversification, operating cost, effective tax rate, inflation rate and real GDP growth. Thus, the total observation for each dependent and explanatory variables were 96 (panel data of 8 commercial banks for 12 years). The table 4.1 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample banks over the year 2002 to 2013.

The NIM which is measured by the net interest income divided by the total loan and advances has a mean value of 5.76 percent. This implies that, the sample banks on average earned 5.76 percent net interest income of the total loan and advances. Since NIM reflects the cost of bank's intermediation services and the efficiency of the bank, the higher the NIM the higher the bank's profit and the more stable the bank is. Accordingly, during the study period the sample commercial banks in Ethiopia had relatively good performance which is measured by NIM when it's compared with the ROA. On the other hand, the ROA measured by the NI divided by TA has a mean value of 2.42 percent. This indicates that the sample banks on average earned a NI of 2.42 percent of the total asset. Since ROA indicates the efficiency of the management of a company in generating NI from all the resources of the institutions, the higher ROA shows that the company is more efficient in using its resources. The maximum

value of ROA was 4.03 and minimum value of -2.13. That means, the most profitable bank among the sampled banks earned 4.03 cents of net income for a single birr invested in the assets of the firm. On the other hand, the least profitable bank of the sampled banks incurred -2.13 cents of loss for each birr investment in the assets of the firm and this loss may be due to lack of efficiency in expense management or high operating costs. Thus, this causes poor performance. This means that, the higher costs of operation negatively affect bank performance.

Regarding the independent variables, the bank size which was measured by the natural logarithm of TA has a mean value of 8.4 with a maximum and minimum value of 12 and 6 percent respectively. In addition, the standard deviation of the bank size was 1.32 percent. This implies that in the study period the sample commercial banks have a small variation in their total asset. The other independent variable used in the study was the income diversification which is measured by non-interest income divided by total income has a mean value of 40.54 percent with a standard deviation of 8.98 percent including the maximum and minimum value of 61.4 and 18.2 respectively. This shows that in the study period the sample commercial banks have higher variation in diversification of their source of income. On the other hand, the capital structure measured by debt divided by equity has a mean value of 916.9 percent. This shows that during the study period the sample commercial banks finance their operation using debt than equity. This is because the capital structures of the commercial banks were dominated by debt and this debt comes from customer's deposit. The maximum and the minimum value were 2571.41 and 256.82 percent respectively with a standard deviation of 422.66. This indicates that in the study period the sample commercial banks have higher variation in using debt and equity to finance their operation. Another important variables used in the study was the operating cost which is measured by the total expenses divided by revenue. The operating costs have a mean value of 57.59 percent. This result shows that on average the sample commercial banks incurred cost of 57.59 percent of the total revenue. Moreover the standard deviation of 16.5 shows that there was higher variation among the sample commercial banks in their operating costs.

Regarding the external variables, real GDP growth, inflation rate and the effective tax rate have a mean value of 8.33, 14.16 and 29.9 percent respectively. Among the external variables the effective tax rate has higher mean value. This reveals that on average the sample commercial banks incurred tax of 29.9 percent out of the operating income before tax. Moreover, inflation has higher standard deviation of all external variables with 12.65 percent. This indicates higher variability and this reveals that inflation in Ethiopia was not stable during the study period.

Table 4.1 Summary of descriptive statistics

<b>Dependent variables</b>	<b>Observation</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Minimum</b>	<b>Maximum</b>
<b>NIM</b>	96	5.76	1.4	2	9
<b>ROA</b>	96	2.42	1.03	-2.13	4.03
<b>Independent variables</b>	<b>Observation</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Size</b>	96	8.4	1.32	6	12
<b>Incdiver</b>	96	40.54	8.98	18.2	61.4
<b>Cst</b>	96	916.94	422.66	256.82	2571.41
<b>Opcost</b>	96	57.59	16.5	29.42	150.5
<b>Taxrate</b>	96	29.93	11.49	-7	125
<b>Gdp</b>	96	8.33	4.32	-2.1	13.57
<b>Infl</b>	96	14.16	12.65	-10.6	36.4

Source: computed from the financial statement of commercial banks in Ethiopia and from MOFED report (2013).

## 4.2. Correlation analysis

In this section the correlation analysis between the dependent and independent variables were presented.

Based on the table 4.2, the size, real GDP growth and inflation rate were positively correlated with NIM. These correlations clearly shows that, as the bank size, real GDP growth and inflation rate increases, the performance indicator (NIM) also moves in the same direction. On the other hand, the income diversification, capital structure, operating cost and effective tax rate were negatively correlated with the performance indicator (NIM). This clearly shows that, as the income diversification, capital structure, operating cost and effective tax rate increases ,the performance measure (NIM) moves in opposite direction.

Table 4.2 Pearson correlation coefficient matrix for NIM

Variables	NIM	Size	GDP	Infla	incdiv	Cst	opcost	taxrate
NIM	1							
Size	0.41	1						
GDP	0.21	0.19	1					
Infla	0.44	0.39	0.23	1				
Incdiv	-0.005	0.398	0.23	0.185	1			
Cst	-0.35	0.47	-0.04	-0.14	0.18	1		
Opcost	-0.6	-0.44	-0.44	-0.39	-0.31	0.15	1	
Taxrate	-0.07	-0.25	-0.15	-0.27	-0.29	-0.15	0.09	1

Source: computed from the financial statement and from MOFED (2013)

Moreover, ROA is correlated with other independent variables positively or negatively. The operating cost was the most negatively correlated variable with ROA. This correlation clearly shows that, as the operating cost increases, the performance of the sample commercial banks which is measured by the ROA moves to the opposite direction. In addition to this, the capital

structure and the effective tax rate also negatively correlated with the performance measure (ROA). This shows that, as capital structure and effective tax rate increases, ROA moves to the opposite direction. On the other hand, income diversification, inflation, GDP and bank size were positively correlated with ROA.

Table 4.3; Pearson correlation coefficient matrix for ROA

Variables	ROA	Size	GDP	Infla	Incdiv	Cst	opcost	taxrate
ROA	1							
Size	0.31	1						
GDP	0.44	0.19	1					
Infla	0.47	0.39	0.23	1				
Incdiv	0.34	0.398	0.23	0.185	1			
Cst	-0.38	0.47	-0.04	-0.14	0.18	1		
Opcost	-0.88	-0.44	-0.44	-0.39	-0.31	0.15	1	
Taxrate	-0.21	-0.25	-0.15	-0.27	-0.29	-0.15	0.09	1

Source: computed from the financial statement and from MOFED ( 2013)

### 4.3. CLRM assumptions and Diagnostic tests

The diagnostic tests were undertaken to ensure that the data fits the basic assumption of the classical linear regression model. Test of the classical linear regression model assumptions were presented as follows.

#### 4.3.1. Heteroskedasticity test

The homoskedasticity is one of the assumptions of the CLRM which states that the variance of the errors must be constant. If the errors do not have a constant variance, they are said to be heteroskedastic (Brooks, 2008).As noted in Woolridge (1999) Homoskedasticity fails

whenever the variance of the unobservable changes across different segments of the population, which are Determined by the different values of the explanatory variables.

The Breusch-pagan\cook-weisberg test for heteroskedasticity was used to test the presence of the heteroskedasticity. Accordingly, table 4.4 shows that the p-value is greater than 5%. This shows that there is no evidence for the presence of the heteroskedasticity.

Table 4.4 Heteroskedasticity test for NIM

<b>Ho: constant variance</b>	
<b>Variables: fitted values of NIM</b>	
<b>Chi square (1)</b>	<b>=0.51</b>
<b>Prob&gt;chi square</b>	<b>=0.4748</b>

Source: computed from financial statement and from MOFED ( 2013)

On the other hand, table 4.5 shows the Breusch-pagan\cook-weisberg test for heteroskedasticity for the variable ROA. Since the p-value is greater than 5%, this shows that there is no evidence for the presence of the heteroskedasticity. Thus, the assumption of the classical linear regression model was not violated.

Table 4.5 Heteroskedasticity test for ROA

<b>Ho: constant variance</b>	
<b>Variables: fitted values of ROA</b>	
<b>Chi square (1)</b>	<b>=0.04</b>
<b>Prob&gt;chi square</b>	<b>=0.8441</b>

Source: authors own computation using financial statement and MOFED report (2013) publication.

### 4.3.2. Multicollinearity test

Multicollinearity means the existence of a “perfect” or exact, linear relationship among some or all explanatory variables (Gujarati, 2004). As noted in Gujarati (2004) if multicollinearity is perfect, the regression coefficients of the explanatory variables are indeterminate and their

standard errors are infinite. If multicollinearity is less than perfect, the regression coefficients, although determinate, possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy.

Table 4.6 Pearson correlation matrix

Variables	Size	GDP	Infla	Incdiv	Cst	Opcost	Taxrate
Size	1						
GDP	0.19	1					
Infla	0.39	0.23	1				
Incdiv	0.398	0.23	0.185	1			
Cst	0.47	-0.04	-0.14	0.18	1		
Opcost	-0.44	-0.44	-0.39	-0.31	0.15	1	
Taxrate	-0.25	-0.15	-0.27	-0.29	-0.15	0.09	1

Source: computed from the financial statement and from MoFED (2013)

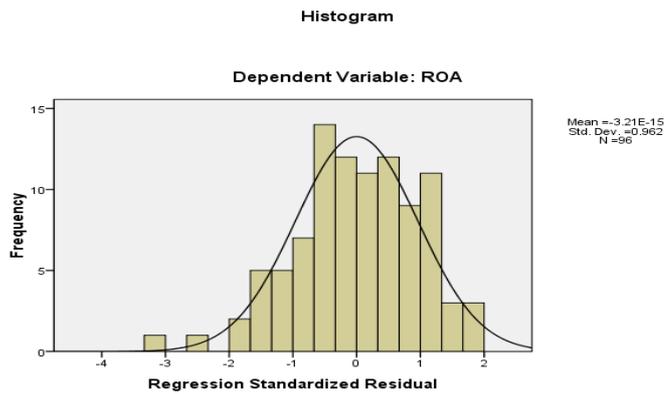
As shown from table 4.6 of the correlation matrix, the correlation among the explanatory variables was less than 0.50. This shows there is no higher correlation among the explanatory variables. This reveals that there is no multicollinearity problem. Furthermore Li Yuqi (2007) stated that problem of multicollinearity exists when correlation coefficient among the explanatory variables are greater than 0.75. Since almost all correlations among the explanatory variables were weak, there is no multicollinearity problem in this study. Furthermore, Variance inflation factor (VIF) is also used to test multicollinearity problem. Since the result is below ten and tolerance is near to one, there is no multicollinearity problem in the study (see appendix 5). In this case the assumption of the classical linear regression model assumption was fulfilled.

### 4.3.3. Normality test

Normality assumption is required in order to conduct single or joint hypothesis tests about the model parameters. In this study to check whether the normality test was adequately met, the histogram was used. If the residuals are normally distributed, the histogram should be bell-shaped (Brooks, 2008). Figure 4.1 and figure 4.2 shows that the shape of the histogram indicates that the residuals are normally distributed around its mean of zero and standard deviation of one.

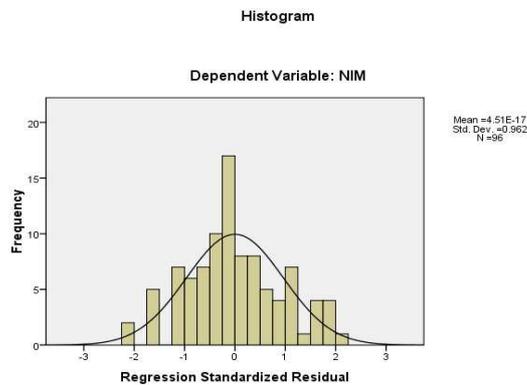
ROA model normality test

Figure 4.1 ROA model normality test



NIM model normality test

Figure 4.2 NIM model normality test



Sources: Spss output

#### 4.3.4. Autocorrelation tests

According to Books (2008), the covariance between the error terms over time (or cross-sectional, for that type of data) is zero. That means, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated or they are serially correlated.

To test the presence of autocorrelation, the Durbin-Watson test is used. As noted in Brooks (2008), Durbin Watson is a test for first order autocorrelation (it is a test for a relationship between an error and its immediate previous value). If the Durbin Watson test approaches to two, it is an indication of the absence of autocorrelation. In this study the Durbin Watson test of 1.891143 for NIM and 1.946119 for ROA model which are closer to two shows the absence of autocorrelation problem .

Table 4.7 Autocorrelation test for ROA model

**Durbin-Watson d- statistic (8, 96) =1.946119**

Table 4.8 Autocorrelation test for NIM model

**Durbin-Watson d-statistic (8, 96) =1.891143**

#### **4.4. Model selection; fixed effect versus random effect models**

The model used to examine the determinants of performance of commercial banks in Ethiopia is panel data model. As noted in Brooks (2008), there are two panel data estimator approaches that can be employed in financial research: fixed effects models and random effects models. The fixed effect regression is the model to use when researcher wants to control for omitted variables that differ between cases but are constant over time. It allows using the changes in the variables over time to estimate the effects of the independent variables on dependent variables (Li Yuqi, 2006). Similarly, according to (Li Yuqi, 2006), between effects regression with between effects is the models to use when want to control for omitted variables that change over time but are constant between cases. It allows using the variation between cases to estimate the effect of the omitted independent variables on dependent variable. In contrast, if we have reasons to believe that some omitted variables may be constant over time but vary between cases and others may be fixed between cases but overtime, then we can include both types by using random effects (Li Yuqi, 2007).

The best way of choosing between the fixed effect model and the random effect models is running the hausman test. The hausman test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results (Li Yuqi, 2007). According to Brooks (2008), if the p-value for the hausman test is less than 1%, this shows that the random effects model is not appropriate and that the fixed effects model is to be preferred. Accordingly, Appendix 1 of the hausman specification tests shows that the first model has a p-value of 0.0094 for the regression model of ROA, size, GDP, Infl, Incdiv, Cst, Opcost and Tax rate. This indicates that the fixed effect model is preferred to the random effect. Moreover, the second model has a p-value of 0.0002 for the regression model of NIM, Size, GDP, Infl, Incdiv, Cst, Opcost and Tax rate. Since the p-value is less than 1%, the fixed effect is the appropriate model for this study.

## 4.5. Regression analysis

This section presents the overall results of the regression analysis on the determinants of bank performance.

In this study ROA was used as a main performance measure. The reason for using ROA as the measurement of bank performance was because The ROA reflects the ability of a bank's management to generate profits from the bank's assets and also indicates how effectively the bank's assets are managed to generate revenues. Moreover, performance is best measured by ROA (Tan et al., 2012). As an alternative performance measure, this study uses the NIM. The regression analysis result is presented by using separate table for each model. Table 4.9 shows the regression analysis for ROA. In this regression analysis the dependent variable is ROA while the independent variable is size, capital structure, operating cost, income diversification, effective tax rate, real GDP growth and inflation. Besides, table 4.10 shows the result of the regression analysis for NIM. In this model the dependent variable was NIM, while size, capital structure, operating cost, income diversification, real GDP growth and inflation rate were the independent variables.

Table 4.9 ROA model fixed effect regression result

Variable	$\beta$	Std.Err.	t	p> t
Size	0.2090555	0.0429522	4.87	0.000
GDP	0.0074907	0.0076153	0.98	0.328
Infl	0.000781	0.0028934	0.27	0.788
Incdiv	-0.0030396	0.0043813	-0.69	0.490
Cst	-0.0002424	0.0001402	-1.73	0.088
Opcost	-0.0490262	0.0025119	-19.52	0.000
Tax	-0.0110297	0.0027804	-3.97	0.000
R-squared	0.7664			
Prob(F-statistic)	0.0000			
No of observation	96			

As shown from the above table the R-square statistics of the model was 76.64 %. The result indicates that about 76.64 % of the variability in the dependent variable (Return on Asset) is explained by the independent variables used in the model. That is capital structure, bank size, operating cost, income diversification; effective tax rate, real GDP growth and inflation rate collectively explain 76.64% of the change in ROA. The remaining 23.36% of the variability in the dependent variable is left unexplained by the explanatory variables used in the study. This means that the remaining 23.36% of the changes was explained by other variables which are not included in the model.

Based on the table 4.9, from the internal factors except income diversification the other variables had significant effects on performance of banks. Furthermore, among the external variables only tax rate had significant impact on performance. Since the p-value for size, operating costs and effective tax rate were 0.0000; this revealed that size, operating costs and tax rate were significant at 1% significance level while capital structure was significant at 10% significance level.

When we come to individual coefficient among the explanatory variables, size, GDP and inflation rate had a coefficient of 0.2090555, 0.0074907 and 0.000781 respectively. This revealed that there was a positive relationship between the independent variables like size, GDP and inflation with the dependent variable ROA. Thus the decrease of those variables will lead to a decrease in ROA and also the increase of those variables will lead to an increase in ROA.

On the other hand, income diversification, capital structure, operating costs, and tax rate had a negative relationship with bank performance because their respective coefficients were - 0.0030396, -0.0002424, -0.0490262 and -0.0110297. This indicates that there was an inverse relationship between the above four independent variables and ROA.

Table 4.10 below presents the second regression result made to examine the determinants of bank performance of commercial banks in Ethiopia measured by the NIM.

Table 4.10 NIM model fixed effect regression result

Variables	$\beta$	std.Err.	t	p> t
Size	0.6226195	0.1216984	5.12	0.000
GDP	-0.0005635	0.0215767	-0.03	0.979
Infl	0.0094383	0.0081979	1.15	0.253
Incdiv	-0.0539607	0.0124137	-4.35	0.000
Cst	-0.0013703	0.0003973	-3.45	0.001
Opcost	-0.0279045	0.0071172	-3.92	0.000
Tax	-0.0031118	0.0078779	-0.40	0.694
R-squared	0.6279			
Prob (F-statistic)	0.000			
No of observation	96			

From the table 4.10 the R-squared statistics of the model was 62.79%. The result reveals that about 62.79% of the variability in the dependent variable (NIM) is explained by the independent variables used in the model. The remaining 37.21% of the variability in the dependent variables is left unexplained by the explanatory variables used in the study. This means that the remaining 37.21% of the changes was explained by other variables which are not included in the model.

According to table 4.10 all bank specific factors had a significant impact on performance of commercial banks in Ethiopia. Regarding the three macroeconomic factors all of them had insignificant effect on the performance of commercial banks in Ethiopia. The p-value for the bank specific factors namely, size, income diversification, capital structure and operating cost were 0.000, 0.000, 0.001 and 0.000 respectively. This indicates that all bank specific factors used in this study were statistically significant at 1% significance level.

Furthermore the individual coefficient among the explanatory variables like real GDP growth, income diversification, capital structure, operating cost and effective tax rate had a coefficient of -0.0005635,-0.0539607,-0.0013703,-0.0279045, and -0.0031118respectively. This shows that there was a negative relationship between those independent variables and the dependent variable NIM.

On the other hand, bank size and inflation rate had a positive relationship with bank performance measured by NIM because their respective coefficients were 0.6226195 and 0.0094383 respectively. This revealed that there is a positive relationship between the above variables and NIM.

#### **4.6. Discussions of the results**

In this section the general result of the regression analysis was presented by supporting the result with the previous studies made in this area. This is undertaken with reference of the results obtained from the regression analysis made in the previous section to examine the determinants of financial performance of Ethiopian banking industry with previous studies made in this area.

**Operating cost:**-the operating cost provides information on the efficiency of management regarding expenses relative to income. The beta coefficient for this variable is -0.0490262 and -0.0279045 for ROA and NIM model respectively and also significant at 1% significance level with p-value of 0.000. This result reveals that a decrease in expenses increases the profit of the commercial banking industry in Ethiopia. This indicates that the commercial banks in Ethiopia have much to profit if they are able to exercise efficient cost management practices. The result is consistent with the studies of Ghazouani et al. (2013), Ezra (2013), Dietrich et al. (2009), Sufian (2011), Birhanu(2012) and Amdemikael(2012).Therefore, the first hypothesis which states Operating cost negatively affect bank performance is accepted by the study because the operating cost negatively affects the performance of the bank.

**Bank size:** - the bank size which is measures by the log of total asset has beta of 0.2090555 and 0.6226195 for ROA and NIM model respectively with p-value of 0.000. This direct relationship between bank size and performance reveals that large commercial banks perform better than smaller commercial banks. The result is consistent with the previous studies of Gul (2011),Athanasoglou et al.(2006), Sufian et al. (2009),Weersainghe et al.(2013),Yadollahzadeh et al.(2013),Sarita et al.(2012),Masood et al.(2012) suggesting that large banks may benefited from economies of scale. In contrast, Dietrich et al. (2009) and Ezra (2013) found negative relationship between bank size and performance suggesting that

the smaller the bank, the more efficient the bank will be. Therefore, the finding of this study shows that in Ethiopian banking industry the large bank size perform better than the smaller banks due to the existence of economies of scale. Thus, this study accepted the hypothesis which stated there is a positive relationship between bank size and bank performance in Ethiopia.

**Capital structure:**-the capital structure which is measured by debt to equity has the beta value of -0.0002424 and -0.0013703 for ROA and NIM model with p-value of 0.088 and 0.000 respectively. This shows that capital structure significantly affects the performance of the bank at 10% significance level for ROA model and 1% significance level for NIM model. The significant negative regression coefficient for total debt implies that an increase in the debt position adversely affects the performance of banks. Even though this finding contradicts with studies made by Masood et al. (2012), the result is consistent with study made by Yadollahzadeh et al. (2013) for Iran banks. According to A.M.Goyal (2013), an increase in the total debt is associated with a decrease in performance. This is explained by the fact that debts are relatively more expensive than equity and therefore employing higher proportions of them could lead to low profitability. Thus, the hypothesis which states there is a positive relationship between capital structure and performance is rejected by the study.

**Income diversification:** - The beta value for income diversification is -0.0030396 and -0.0539607 with p-value of 0.490 and 0.000 for ROA and NIM model respectively. The negative relationship of income diversification with performance of the bank implies that if the bank fee based income is very low definitely their performance will be affected. Even though this finding contradict with the study of Jiang *et al.*(2003),Sufian *et al.*(2012),Kosmidou *et al.*(2006) suggesting that revenues generated from new business have significant contribution to improve performance of the bank, the result is consistent with the studies of Sufian *et al.*(2009),M.Kabir *et al.*(2003), Tan *et al.*(2012). The authors stated that, even though noninterest income adds income to banks; those services generate lesser profits when compared to loans. If a bank shifts from interest income service to non-interest income service their performance decrease. Based on the result, this study rejects the null hypothesis

which said there is a positive relationship between income diversification and bank performance.

**Effective tax rate:** -the significant macroeconomic variable used in this study is the effective tax rate. The beta value was -0.0110297 and -0.0031118 with p-value of 0.000 and 0.694 for ROA and NIM model respectively. The negative relationship between effective tax rate and bank performance reveals that the more taxes paid by the bank, the higher cost incurred by the bank, thus negatively affects the performance of the bank. This finding is consistent with the studies of Dietrich *et al.* (2009), M.Kabir *et al.* (2003) and Tan *et al.* (2012). Based on the regression result, this study accepts the null hypothesis which states effective tax rate negatively affects performance.

**Real GDP growth:** - as in the previous studies, the results concerning the real GDP growth are mixed. The p-value was 0.328 and 0.979 for ROA model and NIM model respectively; this shows that GDP is not significant at 1%, 5% and 10% significance level. Besides, the beta value 0.0074907 for ROA model shows the positive impact of GDP on bank performance. However, for NIM model the beta is -0.0005635 which shows the negative impact of the GDP on bank performance. while Weersaingh *et al.* (2013), Ben (2003),Sufian (2011),Sufian *et al.*(2009) found positive relationship of real GDP growth with ROA, Ezra (2013),Ghazouani *et al.*(2013) obtain a negative impact of real GDP growth on NIM. The finding reveals that the effect of GDP growth on Ethiopian banking industry is insignificant and also it varies with the measure of performance used. Based on the regression result, this study fails to reject the hypothesis which says there is a positive relationship between real GDP growth and bank performance.

**Inflation:** - the result for inflation showed a positive insignificant effect on the performance indicators having p-value of 0.788 and 0.253 for ROA and NIM model respectively. This may suggest that due to the inability of banks to accurately predict the levels of inflation, the banks lose the opportunity to benefit from inflationary environment to increase profits. The hypothesis which explains there is a positive relationship between inflation and bank

performance is accepted by this study since the beta value is 0.000781 and 0.0094383 for ROA model and NIM model respectively.

Generally, from the above discussion the Ethiopian banking industry performance is mainly affected by the internal factors which the management of the bank has control over. However, the external factors have no significant effect on bank performance except the effective tax rate.

## CHAPTER FIVE

### 5. CONCLUSION AND RECOMMENDATION

*Based on the finding of the study conclusions were drawn and possible recommendations were forwarded. Accordingly, the first section presents the conclusion part and the second section presents the possible recommendation.*

#### 5.1. Conclusion

The main objective of this study was to examine the determinants of financial performance of commercial banks in Ethiopia. According to previous studies made on the determinants of financial performance, performance is affected by both internal and external factors. Internal factors are factors that are mainly influenced by a bank's management and also called bank specific factors. Those factors include bank size, capital structure, operating cost, income diversification, nonperforming loan, liquidity, loan and advances among others. Furthermore, external factors represent events outside the influence of the banks and also called macroeconomic factors such as real GDP growth, inflation rate, and effective tax rate and interest rate among others.

By using internal factors such as capital structure, bank size, operating cost and income diversification in addition to the external variables real GDP, inflation rate and effective tax rate this study examined the determinants of financial performance of commercial banks in Ethiopia over the period 2002-2013. Thus, panel data for eight banks for twelve years was used for the analysis purpose. Data for the bank specific factors were obtained from NBE whereas data of external factors were obtained from MOFED. Before making regression analysis, diagnostic tests were made for the classical linear regression model by using STATA version software12.

Based on correlation analysis, Bank size, real GDP growth and inflation rate were positively correlated with NIM. These correlations clearly shows that, as the bank size, real GDP growth and inflation rate increases, NIM also moves on the same direction. On the other hand, the

income diversification, capital structure, operating cost and effective tax rate were negatively correlated with NIM. This clearly shows that, as the income diversification, capital structure, operating cost and effective tax rate increases, NIM moves in opposite direction.

Moreover, the capital structure, operating cost and the effective tax rate negatively correlated with ROA. This shows that, as capital structure and effective tax rate increases, ROA moves to the opposite direction. On the other hand, income diversification, inflation, GDP and bank size were positively correlated with ROA.

Based on the empirical findings, both capital structure and operating cost negatively and significantly affect performance measured by ROA and NIM. While income diversification significantly affects NIM, it has insignificant impact on ROA. Similarly, tax rate affect ROA negatively and significantly but related with NIM negatively and insignificantly. Moreover, inflation affect both ROA and NIM positively but insignificantly while GDP has insignificant effect on both ROA and NIM it is positively related with ROA but have negative impact on NIM. Furthermore, bank size has positive and significant impact on ROA and NIM.

The negative and significant impact of operating cost on both performance measures (ROA and NIM) shows that decrease in expenses increases the performance of the commercial banking industry in Ethiopia. This indicates that the commercial banks in Ethiopia have much to profit if they are able to exercise efficient cost management practices. The negative coefficient of the operating cost implies that there is a lack of efficiency in expense management in Ethiopian commercial banking industry. Thus, highly significant and negative coefficient of operating cost causes poor performance in Ethiopian commercial banks. This means that, the higher costs of operation negatively affect bank performance.

Bank size positively and significantly affects the performance of the bank. This direct relationship between bank size and performance reveals that large commercial banks perform better than smaller commercial banks because large banks may benefited from economies of scale and also by increasing size some costs can be reduced simply by increasing the size. The finding of this study shows that in Ethiopian banking industry the large bank size perform

better than the smaller banks due to the existence of economies of scale. In other ways, the large size banks obtain advantage by their size to generate more return.

The capital structure which is measured by debt over equity, significantly but negatively affects bank performance. The significant negative regression coefficient for total debt implies that an increase in the debt position adversely affects the performance of banks. In addition to this, banks that depend highly on equity financing option perform better than banks that depend highly on debt financing option. The result implies that Ethiopian commercial banks that highly depend on equity financing perform better than banks that highly depend on debt financing because debts are relatively expensive than equity.

The significant and negative relationship of income diversification which is measured by the noninterest income to total income with performance of the bank implies that banks which obtain a higher proportion of their income from source other than interest income such as fee based services tend to perform poor.

Among the macroeconomic factors used in this study the effective tax rate significantly but negatively affects ROA. The negative relationship between effective tax rate and bank performance reveals that the more taxes paid by the bank, the higher cost incurred by the bank, thus negatively affects the performance of the bank.

The results concerning the real GDP growth are mixed. Real GDP growth has insignificant and positive effects on ROA but negative effect on NIM. The finding reveals that the effect of GDP growth on Ethiopian banking industry is insignificant and varies with the measure of performance used. Regarding inflation the result showed a positive insignificant effect on the performance indicators. This may suggest that due to the inability of banks to accurately predict the levels of inflation, the banks lose the opportunity to benefit from inflationary environment to increase profits.

## **5.2. Recommendation**

Based on the result of the regression analysis, the study forwarded the following recommendations.

Based on the finding of the study, the Ethiopian commercial banks were mainly affected by the bank specific factors. Because, most of the bank specific factors had significant impact on bank performance. However, the macroeconomic factors have insignificant effect on the performance of the Ethiopian commercial banks except the tax rate which have negative but significantly affects ROA. Since the management of the bank has control over the bank specific factors, it's possible to improve the performance of the bank by giving more attention on the identified bank specific factors such as, bank size, income diversification, capital structure and operating cost.

Furthermore, from the macroeconomic factors effective tax rate had significant impact on the performance of the bank. Thus, the Ethiopian commercial banks cannot ignore the macroeconomic factors while formulating policies to improve the performance of the bank. Moreover, by predicting the impact of macroeconomic factors on the performance of the bank, it's possible for the commercial banks in Ethiopia to improve their performance.

If the bank fee based income is very low, definitely the performance of Ethiopian commercial banks will be affected. Therefore, the Ethiopian commercial banks can improve their fee based income by introducing innovative products and services.

The finding regarding capital structure of the Ethiopian commercial banks reveals that they highly depend on debt financing than equity financing. Since, Ethiopia doesn't have developed money and capital markets, banks are not able to mobilize low cost funds. Hence, this increases the cost of debt financing. If the country develops both money and capital markets, there is a possibility of the banks to improve the capital structure and have positive impact on the performance.

## **Future research direction**

This study suggests for future studies to introduce additional internal and external factors in order to expand the finding of these result. Moreover, it's better to conduct comparative studies on the performance of the bank among the private commercial banks in Ethiopia. Furthermore, most of the studies conducted in Ethiopia have taken top ten experienced banks. This reveals that the newly established banks left unstudied. Thus, in the future it's better to include the newly established.

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## APPENDICES

### APPENDIX 1; Hausman specification test Appendix 1a;ROA model

---- Coefficients ----

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
size	.2090555	.1447028	.0643527	.007472
gdp	.0074907	.0094627	-.001972	.
infl	.000781	.0021454	-.0013644	.
incdiv	-.0030396	.0007482	-.0037878	.
cst	-.0002424	-.0004877	.0002453	.0000505
opcost	-.0490262	-.0476573	-.0013689	.
taxrate	-.0110297	-.0117129	.0006831	.

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg  
 Test: Ho: difference in coefficients not systematic

$\chi^2(7) = (b-B)'[(V_b-V_B)^{-1}](b-B)$   
 = 18.64  
 Prob>chi2 = 0.0094

### Appendix 1b; NIM model

---- Coefficients ----

	(b) Fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
size.	6226195	.6036325	.018987	.0615516
gdp	-.0005635	-.0051599	.0045963	.
infl	.0094383	.007385	.0020533	.
incdiv	-.0539607	-.044033	-.0099278	.0048178
cst	-.0013703	-.0016577	.0002874	.0002696
opcost	-.0279045	-.028227	.0003225	.
taxrate	-.0031118	-.0046124	.0015006	.

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

Test: Ho: difference in coefficients not systematic

$\chi^2(7) = (b-B)'[(V_b-V_B)^{-1}](b-B)$   
 = 28.04  
 Prob>chi2 = 0.0002

## APPENDIX 2; Heteroskedasticity test

### Appendix 2a; ROA model

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of roa

chi2(1) = 0.04  
Prob>chi2 = 0.8441

### Appendix 2b; NIM model

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of nim

chi2(1) = 0.51  
Prob>chi2 = 0.4748

## APPENDIX 3; Autocorrelation test

### Appendix 3a; Autocorrelation test for ROA model

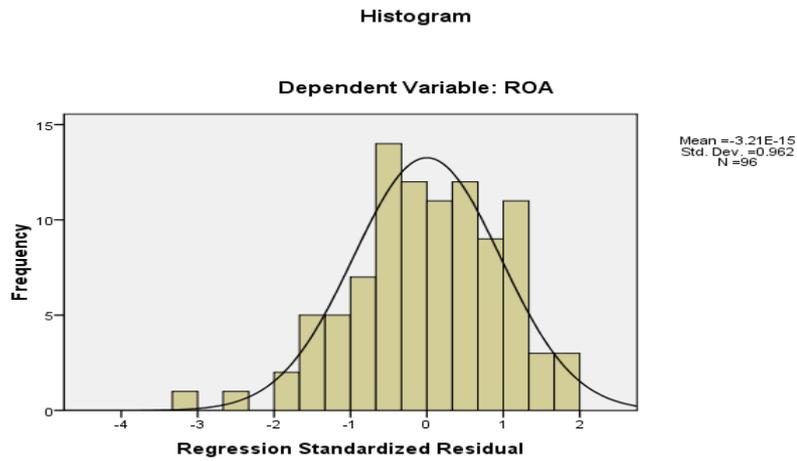
Durbin- Watson d-statistic (8, 96) = 1.946119

### Appendix 3b; Autocorrelation test for NIM model

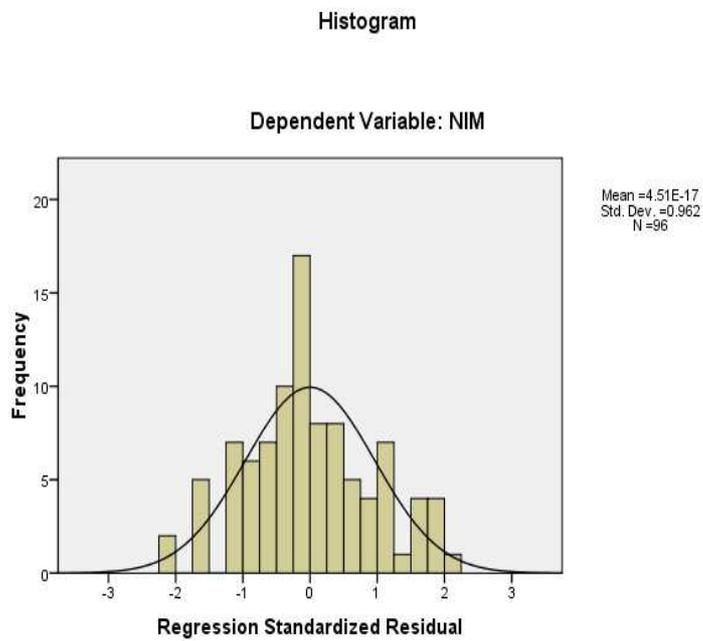
Durbin -Watson d-statistic (8, 96) = 1.891143

## APPENDIX 4; Normality test

### Appendix 4a; ROA model



### Appendix 4b; NIM model



## APPENDIX 5; Multicollinearity test

Variable	VIF	1/VIF
Size	2.44	0.409897
opcost	1.87	0.534279
cst	1.84	0.544329
infl	1.52	0.658865
incdiv	1.31	0.765021
gdp	1.27	0.786306
taxrate	1.20	0.834386

Mean VIF | 1.63

.corr size gdpinflincdivcstopcosttaxrate  
(Obs=96)

	Size	gdp	infl	incdiv	cst	opcost	taxrate
Size	1.0000						
Gdp	0.1906	1.0000					
Infl	0.3936	0.2334	1.0000				
Incdiv	0.3982	0.2317	0.1854	1.0000			
Cst	0.4701	-0.0429	-0.1413	0.1819	1.0000		
opcost	-0.4416	-0.4357	-0.3940	-0.3133	0.1501	1.0000	
taxrate	-0.2533	-0.1466	-0.2723	-0.2926	-0.1518	0.0901	1.0000

## Appendix 6; Pearson correlation coefficient for ROA and NIM model

.cornimroa size gdpinflincdivcstopcosttaxrate  
(Obs=96)

	Nim	roa	size	gdp	infl	incdiv	cst	opcost	taxrate
Nim	1.0000								
Roa	0.6646	1.0000							
Siz	0.4054	0.3142	1.0000						
Gdp	0.2147	0.4406	0.1906	1.0000					
Infl	0.4468	0.4718	0.3936	0.2334	1.0000				
Incdiv	-0.0051	0.3361	0.3982	0.2317	0.1854	1.0000			
Cst	-0.3478	-0.3854	0.4701	-0.0429	-0.1413	0.1819	1.0000		
Opcost	-0.6032	-0.8821	-0.4416	-0.4357	-0.3940	-0.3133	0.1501	1.0000	
Taxrate	-0.0727	-0.2140	-0.2533	-0.1466	-0.2723	-0.2926	-0.1518	0.0901	1.0000

## APPENDIX 7; Regression result

### Appendix 7a; ROA model

Fixed-effects (within) regression      Number of obs = 96  
 Group variable: bank                      Number of groups = 8

R-sq: within = 0.9292                      Obs per group: min = 12  
 Between = 0.1273                              avg = 12.0  
 Overall = 0.7664                                max = 12

F (7, 81) = 151.80  
 corr(u\_i, Xb) = -0.2143                      Prob> F = 0.0000

Roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
size	.2090555	.0429522	4.87	0.000	.1235941	.2945169
gdp	.0074907	.0076153	0.98	0.328	-.0076613	.0226427
infl	.000781	.0028934	0.27	0.788	-.0049759	.0065379
incdiv	-.0030396	.0043813	-0.69	0.490	-.011757	.0056778
cst	-.0002424	.0001402	-1.73	0.088	-.0005214	.0000366
opcost	-.0490262	.0025119	-19.52	0.000	-.0540242	-.0440282
taxrate	-.0110297	.0027804	-3.97	0.000	-.0165619	-.0054976
_cons	4.085664	.432342	9.45	0.000	3.225439	4.945889

### Appendix 7b; NIM model

Fixed-effects (within) regression      Number of obs = 96  
 Group variable: bank                      Number of groups = 8

R-sq: within = 0.6694                      Obs per group: min = 12  
 Between = 0.4566                              avg = 12.0  
 Overall = 0.6279                                max = 12

F (7, 81) = 23.43  
 corr(u\_i, Xb) = 0.0242                      Prob> F = 0.0000

Nim	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Size	.6226195	.1216984	5.12	0.000	.3804779	.8647611
Gdp	-.0005635	.0215767	-0.03	0.979	-.0434943	.0423673
Infl	.0094383	.0081979	1.15	0.253	-.006873	.0257496
Incdiv	-.0539607	.0124137	-4.35	0.000	-.07866	-.0292614
Cst	-.0013703	.0003973	-3.45	0.001	-.0021608	-.0005799
Opcost	-.0279045	.0071172	-3.92	0.000	-.0420655	-.0137435
Taxrate	-.0031118	.0078779	-0.40	0.694	-.0187862	.0125627
_cons	5.518305	1.224973	4.50	0.000	3.080992	7.955618

Appendix 8; Summary of ratio data

<i>year</i>	<i>bank</i>	<i>NIM</i>	<i>ROA</i>	<i>Size</i>	<i>GDP</i>	<i>INFL</i>	<i>Inc.div.</i>	<i>CST.</i>	<i>Op.cost</i>	<i>tax rate</i>
2002	CBE	2	-2.13	10	1.5	-10.6	42	2571.41	150.5	-7
2003	CBE	5	2.25	10	-2.1	10.9	48	1795.07	44.84	24
2004	CBE	5	1.19	10	13.57	7.3	46	1770	61.59	31
2005	CBE	4	1.72	10	11.8	6.1	53	2221.13	43.07	28
2006	CBE	6	2.24	10	10.8	10.6	53	2280.41	38.6	28
2007	CBE	7	1.99	11	11.45	15.8	54	929.76	48.07	26
2008	CBE	6	2.7	11	10.78	25.3	48	1005.52	37.15	27
2009	CBE	8	3.23	11	8.79	36.4	39	1078.63	29.42	29
2010	CBE	8	2.65	11	10.13	2.8	39	1235.5	37.53	30
2011	CBE	8	2.51	12	7.29	18.1	42	1724.87	39.41	32
2012	CBE	8	3.42	12	8.46	33.8	42	1955.93	31.47	31
2013	CBE	7	3.5	12	7.5	13.5	43	1959	33	32
2002	CBB	2.5	0.42	7	1.5	-10.6	18.2	1144.16	87.88	50
2003	CBB	3.3	1.17	7	-2.1	10.9	25.8	1092.41	77.42	21
2004	CBB	2.73	0.38	7	13.57	7.3	46.7	1173.49	90.67	43
2005	CBB	2.92	0.93	8	11.8	6.1	57.3	1628.3	76.36	35
2006	CBB	5.6	3.12	7	10.8	10.6	43	1044.59	50	29
2007	CBB	7.1	2.96	8	11.45	15.8	44.5	783.96	62.84	31
2008	CBB	6.7	3.52	8	10.78	25.3	37.8	817.55	47.7	27
2009	CBB	5.54	2.84	8	8.79	36.4	40.6	857.54	53.54	30
2010	CBB	5.73	2.9	8	10.13	2.8	39.4	882.56	50.85	30
2011	CBB	5.33	2.45	8	7.29	18.1	42.9	861.1	59.09	30
2012	CBB	4.6	1.95	9	8.46	33.8	54.7	1138.57	61.34	29
2013	CBB	5	2	9	7.5	13.5	55	1140	63	30
2002	DB	4.7	1.62	7	1.5	-10.6	33.04	1118.03	66.09	38.5
2003	DB	4.1	1.36	8	-2.1	10.9	38.8	1443.41	72.39	27.03
2004	DB	4.5	2.09	8	13.57	7.3	39.06	1456.4	59.38	28.21
2005	DB	4.93	2.07	8	11.8	6.1	30.8	1307.41	58.55	26.8
2006	DB	5.53	2.93	8	10.8	10.6	34.06	1077.72	49.59	28.11
2007	DB	5.69	3.09	9	11.45	15.8	34.02	1009.46	46.8	27.52
2008	DB	5.89	3.05	9	10.78	25.3	37.3	971.57	50.35	28.12
2009	DB	5.29	2.57	9	8.79	36.4	42.5	971.05	53.35	29.11
2010	DB	4.64	2.62	9	10.13	2.8	50	999.69	52.48	29.29
2011	DB	4.48	3.07	10	7.29	18.1	52.9	949.83	50.87	28.45
2012	DB	6	3.72	10	8.46	33.8	47.97	858.5	48.23	27.01

2013	DB	6	3.07	10	7.5	13.5	43.82	865.3	55.25	25.36
2002	AIB	5.02	1.08	7	1.5	-10.6	24.69	748.85	76.54	36.84
2003	AIB	4	0.99	7	-2.1	10.9	42.6	922.63	82.18	22.22
2004	AIB	4.02	1.47	7	13.57	7.3	45.2	1041.94	71.77	25.71
2005	AIB	4.7	1.7	8	11.8	6.1	36.9	876.32	63.07	30.91
2006	AIB	4.8	2.64	8	10.8	10.6	39.9	871.71	51.32	29.73
2007	AIB	6.1	3.73	8	11.45	15.8	37.5	783.39	40.52	29.9
2008	AIB	5.3	2.96	8	10.78	25.3	40.7	707.21	51.77	30
2009	AIB	5.8	2.23	9	8.79	36.4	42.1	849.62	57.59	29.38
2010	AIB	4.72	3.12	9	10.13	2.8	55.8	857.54	48.91	29.44
2011	AIB	4.7	3.56	9	7.29	18.1	57.5	745.53	45.55	28.6
2012	AIB	6.97	3.3	9	8.46	33.8	39.8	712.56	52.23	25.66
2013	AIB	7	2.47	10	7.5	13.5	37.3	761	59	24.77
2002	BOA	4.63	-0.18	7	1.5	-10.6	18.8	709.93	90	125
2003	BOA	4.33	0.45	7	-2.1	10.9	23.5	855.03	90.12	25
2004	BOA	7.1	2.39	7	13.57	7.3	21.14	755.96	56.1	29.63
2005	BOA	5.83	2.97	8	11.8	6.1	30.9	709.84	46.05	25.61
2006	BOA	6.32	2.99	8	10.8	10.6	25	604.98	44.55	30.33
2007	BOA	6.16	1.97	8	11.45	15.8	24.34	742.61	64.42	29.47
2008	BOA	5.64	0.34	8	10.78	25.3	27.4	917.33	93.69	33.47
2009	BOA	6.05	1.83	9	8.79	36.4	31.9	954.76	64.06	30.95
2010	BOA	4.27	2.24	9	10.13	2.8	44.2	972.53	58.13	28.4
2011	BOA	6.28	2.49	9	7.29	18.1	39.8	1001.4	58.19	29.98
2012	BOA	7.42	2.63	9	8.46	33.8	31.2	808.87	60.09	25.04
2013	BOA	7.1	1.95	9	7.5	13.5	32.51	817	59.35	24.67
2002	WB	5.42	0.93	6	1.5	-10.6	32.3	909.38	80.65	50
2003	WB	4.38	1.24	7	-2.1	10.9	37.3	855.91	77.61	26.67
2004	WB	6.5	2.81	7	13.57	7.3	40	783.72	59.09	28.89
2005	WB	5.8	2.97	7	11.8	6.1	46.7	797.78	58	23.81
2006	WB	5.34	3.14	8	10.8	10.6	45.5	785.88	57.27	24.47
2007	WB	6.03	3.22	8	11.45	15.8	42.2	763.4	52.19	26.8
2008	WB	6.33	3.37	8	10.78	25.3	44.6	581.3	55.84	26.92
2009	WB	7.11	3.53	9	8.79	36.4	50.6	511.94	45.76	29.48
2010	WB	6.93	3.89	9	10.13	2.8	56.3	445.95	43.83	29.66
2011	WB	7.38	4.01	9	7.29	18.1	61.4	502.76	43.78	29.44
2012	WB	8.46	4.028	9	8.46	33.8	48.1	420.35	46.1	26.62
2013	WB	9	3.27	9	7.5	13.5	39.65	468	53.65	24.38
2002	UB	6.8	1.27	6	1.5	-10.6	29.2	256.82	70.83	43
2003	UB	4.5	1.067	6	-2.1	10.9	38.7	415.38	77.42	29

2004	UB	4.2	1.04	7	13.57	7.3	41.3	602.08	78.26	30
2005	UB	4.9	2.89	7	11.8	6.1	49.5	758.4	52.75	28
2006	UB	4.2	2.75	7	10.8	10.6	43.7	737.17	52.38	27
2007	UB	5.82	2.93	8	11.45	15.8	36.5	506.39	54.69	26
2008	UB	5.82	2.8	8	10.78	25.3	38.8	594.79	55	28
2009	UB	5.7	2.01	8	8.79	36.4	39.1	794.73	61.28	30
2010	UB	5.61	2.96	9	10.13	2.8	50.84	824.82	51.5	30
2011	UB	5.92	3	9	7.29	18.1	46.3	757.08	48.85	28
2012	UB	7.83	3.39	9	8.46	33.8	37.63	697.56	51.12	27
2013	UB	7.7	2.82	9	7.5	13.5	33.61	730.68	58.7	24.64
2002	NIB	5.9	2.43	6	1.5	-10.6	35.6	439.39	51.11	40.9
2003	NIB	4.73	1.47	7	-2.1	10.9	43.9	712.8	71.2	31.58
2004	NIB	5.22	2.81	7	13.57	7.3	39.8	706.94	47.3	28.57
2005	NIB	5.21	2.66	7	11.8	6.1	38.5	673.21	51.11	30.3
2006	NIB	5.02	2.86	8	10.8	10.6	33.5	611.23	49.69	28.4
2007	NIB	5.8	2.92	8	11.45	15.8	29.3	513.41	49.04	28.3
2008	NIB	7	3.1	8	10.78	25.3	33.7	510.26	49.85	28.8
2009	NIB	8.04	3.2	8	8.79	36.4	40.5	559.49	48.51	29.95
2010	NIB	6.93	3.36	9	10.13	2.8	52.2	551.44	48.71	29.57
2011	NIB	7.72	3.47	9	7.29	18.1	49.31	507.5	47.6	28.38
2012	NIB	7.6	3.46	9	8.46	33.8	42.9	441.62	48.71	26.51
2013	NIB	8.7	3.13	9	7.5	13.5	32.97	449	55.52	24.38