

Addis Ababa University
College of Business and Economics
Department of Accounting and Finance

**Exogenous Determinants of Commercial Banks Profitability:
Empirical Evidence from the Commercial Banks of Ethiopia**

A thesis submitted to The Department of Accounting and Finance Presented in
Partial Fulfillment of the Requirement for the Degree of Master of Business
Administration in Finance

BY: Dereje Turi Bekana

ID No.: GSR/ 2011/06

Advisor: Abebe Yitayew (PHD)

Addis Ababa, Ethiopia

October, 2015

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Dereje Turi, entitled: Exogenous Determinants of Commercial Banks Profitability: - An Empirical evidence from the Commercial Banks of Ethiopia and submitted in Partial Fulfillment of the Requirement for Master of Business Administration (MBA) in Finance complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

Approved by the Board of Examiners

Examiner	Signature	Date
----------	-----------	------

Examiner	Signature	Date
----------	-----------	------

Advisor	Signature	Date
---------	-----------	------

Chair of department or graduate program coordinator

Acknowledgement

My deepest and warmest thank goes to the Almighty God and his mother Saint Marry, who help me in all aspect of my life including the achievement of this masters program. Along with, I would like to express my sincere gratitude to Dr. Abebe Yitayew. who is instructor in the Department of Accounting and Finance at Addis Ababa University and my advisor, for his expert guidance, helpful criticism, valuable suggestions and encouragement at every stage during the completion of this work. It was pleasant and inspiring experience for me to work under his guidance.

I am also grateful, to NBE change management directors and bank supervision department staffs, for their assistance by giving 25 year audited financial reports.

I add a special note of admiration and gratitude to my families and friends, particularly my wife W/ro Mekides Geleta who carries all the burdens during those difficult times. My last but not least thank goes to my uncle Ato Tsegaye Feyissa for his continuous moral support.

Table of Contents

Contents	Pages
1. Introduction	1
1.1 Background of the Study.....	1
1.2 Statement of the Problem.....	1
1.3 Objectives of the Study	4
1.3.1 General Objective	5
1.3.2 Specific Objectives	5
1.4 Research Questions and Hypothesis	5
1.4.1 Research Questions.....	6
1.4.2 Research Hypothesis.....	6
Research Hypothesis.....	6
1.5 Significance of the study.....	7
1.6 Operational definitions.....	8
1.7 Scope and Limitation of the study.....	9
1.8 Organization of the Study	10
Chapter Two.....	10
2 Literature Review	10
2.1 Theoretical Literature.....	10
2.1.1 Theories on Bank Performance -Profitability.....	11
2.2 Empirical Studies	13
2.3 Conceptual Framework	16
2.3.1 Gross Domestic Product (GDP).....	16
2.3.2 Bank concentration	17

2.3.3	Inflation.....	19
Chapter Three.....		19
3	Research Design and Methodology.....	19
3.1	Research Design.....	19
3.2	Sampling Design	19
3.3	Model Specification	19
3.4	Variables Definition and Measurements	20
3.4.1	The Dependent Variables.....	20
3.4.2	The Independent Variables:	21
Chapter Four		24
4	Data Presentation and Analysis	24
4.1	Trend Analysis	24
4.1.1	Trend Analysis of Real Lending Interest Rate.....	24
4.1.2	Trend Analysis of Nominal Exchange Rate.....	25
4.1.3	Trend Analysis of Real GDP Growth Rate of Ethiopia.....	26
4.1.4	Trend Analysis of Inflation Rate in Ethiopia.....	28
4.2	Correlation Analysis.....	31
4.2.1	Correlation Analysis between ROA and its Explanatory Variables	31
4.2.2	Correlation Analysis between ROE and its Explanatory Variables.....	32
4.2.3.	Correlation Analysisi between NIM and its Explanatory Variables	33
4.3	Regression Analysis	34
4.3.1	Test for linearity Assumption	34
4.3.2	Test for Normality Assumption	37
4.3.3	Test for Multicollinearity	41
4.3.4	Test for Hetroscedasticity	41

4.3.5	Test for Autocorrelation.....	42
4.4	Significance Test of the Coefficients	42
4.4.1	T-test for coefficients (ROE as Dependent Variable).....	42
4.4.2	T-test for coefficients (ROAas Dependent Variable)	43
4.4.3	T-test for coefficients (NIM as Dependent Variable).....	44
4.5	Model Summary.....	45
4.5.1	ROA Model with all the Five Independent Variables	45
4.5.2	ROA Best fit model	45
4.5.3	NIM Model with all the Five Independent Variables	48
4.5.4	ROE as Dependent Variable	49
Chapter Five.....		51
5.	Findings,, Conclusion and Recommendation	51
5.1.	Intrduction	51
5.2.	Findings.....	51
5.3.	Conclusion.....	52
5.4.	Recommendations	52
Reference		54
Annex.....		61

List of Tables

Contents	Pages
Table 1 Bera Jerque Statistics Result for the Regression Models	41
Table 2 Durbin Warson Test Result for the Regression Models	42
Table 3 T-Test for Coefficients (ROE as Dependent Variable)	43
Table 4 T-Test for Coefficients (ROA as Dependent Variable	43
Table 5 T-Test for Coefficients (NIM as Dependent Variable).....	44
Table 6 Variables Entered/ Removed ^b	45
Table 7 ROA Best Fit model Summary.....	46
Table 8 ANOVA of ROA best fit model	46
Table 9 Coefficient of ROA best fit model.....	46
Table 10 NIM model Summary (with all the Five Independent Variables)	47
Table 11 NIM dependent and CR and GDPGR independent	48
Table 12 NIM model summary (CR & GDPGR independent variables)	48
Table 13 NIM Model Coefficients.....	48
Table 14 NIM Model ANOVA(CR & GDPGR independent variables).....	48
Table 15 Variables entered for best fit model.....	49
Table 16 Model Summary for best fit model (ROE dependent variable).....	49
Table 17 ANOVA model (ROE dependent variable)	49
Table 18 ANOVA model (ROE dependent variable)	50
Table 19 Coefficients (ROE dependent variable).....	50

List of Figures

Contents	Pages
Figure 1 Conceptual Framework External Determinants vs Profitability of Commercial Banks	18
Figure 2 Trend of ROA of commercial Banks of Ethiopia.....	24
Figure 3 Trend of ROE of commercial Banks of Ethiopia.....	25
Figure 4 Trend of NIM of commercial Banks of Ethiopia.....	25
Figure 5 Trend of Real Lending Interest Rate of Ethiopia.....	26
Figure 6 Trend of Exchange Rate of Ethiopia.....	28
Figure 7 Trend of Real GDP Growth Rate of Ethiopia.....	29
Figure 8 Trend of Inflation in Ethiopia.....	30
Figure 9 Trends Concentration Ratio.....	30
Figure 10 Correlations between ROA and its Explanatory Variables.....	31
Figure 11 Correlations between ROE and its Explanatory Variables.....	33
Figure 12 Correlations between ROA and its Explanatory Variables.....	34
Figure 13 Scatter Plot Standardized Residual vs Standardized Predicted (ROA).....	35
Figure 14 Scatter Plot Standardized Residual vs Standardized Predicted (ROE).....	36
Figure 15 Scatter Plot Standardized Residual vs Standardized Predicted (NIM).....	36
Figure 16 Histogram ROA.....	37
Figure 17 Histogram ROA (outlier Removed).....	37
Figure 18 Histogram ROE.....	38
Figure 19 Histogram NIM.....	39
Figure 20 Normal P-P Plot ROA.....	39
Figure 21 Normal P-P plot ROE.....	40
Figure 22 Normal P-P Plot NIM.....	40

ABSTRACT

Eogenous Determinants of Commercial Banks Profitability: -An Empirical evidence from the Commercial Banks of Ethiopia

Dereje Turi Bekana

Addis Ababa University, 2015

The main objective of this study is to examine the effect of external determinants on Ethiopian commercial banks from the period 1985 -2013. External determinants were seen by classifying them in to industry-specific and macroeconomic determinants. The study used OLS estimation method to measure the effects of external determinants on profitability. Profitability was measured by three indicators: Average Return on Asset, Average Return on Equity and Net Interest Margin in order to analyze the behavior of each across years. The estimation results show that the external variables in the model altogether explain ROA significantly. However, the explanatory variables fail to explain the rest indicators; ROE and NIM. Being seen independently, the coefficients of all explanatory variables were not significant at 10%. The NBE and commercial banks of Ethiopia policy makers and managers should give due concern by forecasting those explanatory variables in order to maximize the opportunity for better profit and minimize the possible risks.

Key words: profitability, commercial banks

ACRONYMS

ADB	African Development Bank
CBE	Commercial Bank of Ethiopia
CLRM	Classical Linear Regression Model
BJ	Bera-Jarque
CR	Concentration Ratio
DW	Durbin Watson
ES	Efficiency Structure
Exr	Exchange rate
IMF	International Monetary Fund
MP	Market Power
NBE	National Bank Of Ethiopia
NIM	Net Interest Margin
RGDPGR	Real GDP Growth Rate
ROA	Return On Asset
ROE	Return on Equity
RIR	Real Lending Interest Rate
SCP	Structure- Conduct-Performance
SSA	Sub-Saharan Africa

Chapter 1

1. Introduction

1.1 Background of the Study

Financial institutions play a major role in oiling the wheel of growth in any economy of the world. They are financial intermediaries between end users of deposit and various investors. They facilitate various business activities.

The banking sector acts as the life blood of modern economy being a major source of finance. The concept of profitability is important for banks because they largely depend on competitive marketing strategy that determines their success and growth. Bank performance has been one of the main concerns of management experts, investors, and economic analysts. This concern closely relates to the relationship between the banks performance and economic growth. Due to this, the protocols of the banking business have changed a lot in the new millennium compared to the way they used to be in the years by gone (Hussain and Bhatti, 2010).

Bank performance gets a great deal of attention in the finance literature considering that banks serve a pivotal role in the economy. The performance of banks is expressed in various terms, such as competition, concentration, efficiency, productivity, and profitability. Firms with better performance are better able to resist negative shocks and contribute to the stability of the financial system (Athanasoglou et al., 2008). The profitability of the banking system has been one of the hot issues in financial environment. Since the bank industry play a major role in the financial system of the country and it supports the competitiveness of the financial institution. Given the relation between the well-being of the banking sector and the growth of the economy (Levine, 1998), knowledge of the underlying factors that influence the financial sector's profitability is therefore essential not only for the managers of the banks, but also for numerous stakeholders such as the central banks, bankers associations, governments, and other financial authorities. Knowledge of these factors would be useful in helping the regulatory authorities and bank managers formulate future policies aimed at improving the profitability of the banking sector.

Ethiopia aims to sustainably raise growth in line with its goal to reach middle income levels by 2025, while maintaining macroeconomic stability. The government's objectives are to sustain robust economic performance and single digit inflation. To achieve these objectives, current policies promote high public investment supported partly by low nominal interest rates and a tight monetary policy (IMF, 2012). As per IMF, the objectives face vulnerabilities which are related to limited use of available monetary policy instruments (securities) to control inflation; low foreign reserve levels; a possible reinforcement of systemic risks associated with the dominant state-owned CBE and its increasing exposure to public enterprises; large accumulation of debt by public enterprises; and crowding out of the private sector. To mitigate such vulnerabilities, maintaining financial sector stability; Keeping inflation under control to eliminate highly negative real interest rates and exchange rate overvaluation; creating space for an increased private sector's role in the economy; and achieving higher foreign reserve coverage were recommended (IMF, 2012). A proactive liquidity management (e.g., use of treasury bills) is also important to contain the risks of inflation resurging. This would facilitate matching money supply to money demand, encourage the development of the money market, and through a response by the broader interest rate structure support domestic mobilization of resources by the financial sector.

The Ethiopian banking sector comprises 16 banks, including a dominant state-owned bank, CBE, whose assets represent about 70 percent of the sector total, as of April 2013 and the rest 15 banks, mainly private, together account for the remainder. The authorities' development strategy is based on directed lending mainly to public enterprises via CBE and, to some extent, government targeted private sector activities via the government-owned Development Bank of Ethiopia (DBE). This policy, combined with high inflation, and negative real interest rates, results in a significant transfer of resources from creditors (savers) to borrowers, especially the public sector.

Regulation has also effect on commercial banks profitability (Capital, 2013). As cited in Capital (2013) the requirement on commercial banks to purchase NBE bills equivalent to 27 percent of any new loans appears to have a sizable negative impact on commercial banks' intermediation activities. The requirement also has the potential of creating maturity mismatches as the commercial banks collect savings at two to three-year maturity. The directive requires private

commercial banks to hold 27 percent of the gross loan extension (irrespective of the tenor) in a 5 year NBE bill at an interest rate of 3 percent per annum while deposit rates are around 5 percent) and even shorter in some cases, but have to freeze these resources for five years at rates lower than cost of funds. There is also a risk that as the profitability of commercial banks reduces on account of less intermediation because of this directive, they could raise noninterest income charges such as fees and commissions to recoup these losses, further impacting negatively on the private sector. However, banks are currently reporting profit. Recent developments such as the increasingly dominant market share of CBE and its growing exposure to large public enterprises, and the impact of the 27 percent requirement on private banks, suggest a need for a closer scrutiny of the banking system. It would be important to undertake a diagnostic of the sector to better assess potential vulnerabilities that might be building up even in the context of the ongoing implementation of measures in the sector. Government argues that 27 percent NBE bill requirement did not affect private banks and they remain overall highly profitable.

In Ethiopian context, the financial system is dominated by banking industry. The Ethiopian banking industry can be characterized as highly profitable, concentrated and moderately competitive. In most cases, the dominant bank (Commercial Bank of Ethiopia) still seizes quasi-monopoly power Eshete et al. (2013) as cited in Mohammed, 2015. In terms of contestability, the Ethiopian banking industry can be characterized as incontestable as entry in the industry is difficult, due to legal, technological and economic factors. Competition in terms of price is relatively weak in the Ethiopian banking industry. Banks in the Ethiopian case are competing in terms of service quality and efficiency (including use of technological advances), branch network expansions, advertising and prices, put in the order of their significance. Banks performances are governed largely by macroeconomic performances than competitive parameters as high (low) performances coincided with good (bad) macroeconomic conditions (Eshete, 2013).

Notwithstanding the enormously complex and dynamic nature of the environment in which Ethiopian banks compete, there is a growing body of evidence that suggests it is possible to discern relevant indicators of profitability for the banking industry today Machara (2013). The purpose of this study is to develop an appropriate econometric model whereby the primary external determinants of profitability of the commercial banks of Ethiopia could be examined

and understood. To accomplish this purpose, an econometric model based on external aspects of the environment in which the banks operate is developed to determine its effect. A critical review of the relevant literature is followed by an analysis of the statistical data for these banks using the econometric model.

1.2 Statement of the Problem

As business organizations, banks have to make reasonable profit that enables them grow so that withstand shocks if happened and maximize shareholders value. Ethiopian banks are not well developed. However, the economy of Ethiopia is growing continuously since the past decade. Currently, Ethiopia is among the fastest growing countries in the world. This trend is expected to continue at similar rates in the next years.

Knowledge of determinants of bank profitability is important for banks and policy makers (Kosmidou¹, 2008; Sufian and Chong, 2008). There are two commonly accepted categories of determinants of profitability of banking sector. These are internal and external determinants. Khrawish (2011) for example categorized determinants of bank profitability as external and internal. The Internal determinants are those variables that can be controlled by the management whereas the external determinants are those variables beyond the control of the management.

The majority of previous studies made on this topic focused mainly on the internal dimension than the external one. However, the external determinants also deserve attention as the current economic growth of Ethiopia in particular and globalization in general creates opportunities and challenges (risks) for Ethiopian commercial banks. The external determinants of commercial banks profitability are factors which are uncontrollable, but have an effect on bank's profitability. According to Karkrah and Ameyaw (2010) macroeconomic variables has been a major components of the external profit determinants in most studies. The most external factors that have been presented in most studies includes competition/market share, inflation, GDP growth, and interest rate (Haron, Sudin, 2004).

Notwithstanding the enormously complex and dynamic nature of the environment in which Ethiopian banks compete, there is a growing body of evidence that suggests it is possible to discern relevant external determinants of profitability for the banking industry today. The reason

for focusing on the external factors is that, a lot of these macroeconomic factors (which covers monetary and fiscal discipline such as inflation, GDP and interest rates) keep on changing and such frequent changes could affect banks' overall profitability which, in turn, could give an impact to the general economy of Ethiopia. In short, the determinants of profitability of the commercial banking sector might change if the macroeconomics and legal environment changes as well (Alper and Anbar, 2011). In addition, previous studies revealed that these macroeconomic factors have significantly contributed to the development of financial market in some countries such as Turkey (Alper and Anbar, 2011), Nigeria (Aburime, 2008), Macao (Vong and Chan, 2009), Tunisia (Naceur and Goaied, 2003) and Middle East countries (Bashir, 2000).

The purpose of this study is therefore to develop an appropriate econometric model whereby the primary determinants of profitability of commercial banks in Ethiopia could be examined and understood. To accomplish this purpose, an econometric model based on external factors to the banking organizations as they related to their return on assets, return on equity and Net Interest Margin is developed. Since Ethiopian commercial banks have been operating under decades of economic growths and other external environment dynamics, it is important to understand the extent the banking sector profitability is being driven by those external factors. This helps to answer some important questions: To what extent do exogenous factors determine the performance of commercial banks in Ethiopia? This will help the banks and policy makers better forecast risks and seize better opportunities for better performance.

This study has different perspectives than the usually observed performance measures applied in most studies done in Ethiopia and other countries. The gaps in literature this study tries to incorporate is to what extent the external factors affect commercial banks profitability in Ethiopia in depth by taking only the external variables which previous studies focus mainly on the internal one or both together.

1.3 Objectives of the Study

1.3.1 General Objective

The major objective of this study is to investigate the impact of exogenous factors on the profitability of commercial banks of Ethiopia.

1.3.2 Specific Objectives

- i. To determine the degree and direction of relationship between profitability of commercial banks of Ethiopia measured by ROA, ROE, NIM and macroeconomic variables i.e., inflation rate, interest rate, exchange rate and Gross Domestic Product (GDP).
- ii. To determine the degree and direction of relationship between profitability of commercial banks of Ethiopia (ROA, ROE, NIM) and industry specific variables i.e., Market Concentration.

1.4 Research Questions and Hypothesis

1.4.1 Research Questions

- i. How do macroeconomic variables i.e., inflation rate, interest rate, exchange rate and Gross Domestic Product (GDP) affect profitability of commercial banks of Ethiopia; profitability being measured by ROA, ROE, NIM?
- ii. How does industry specific variable i.e., market concentration affect profitability of commercial banks of Ethiopia: Market concentration being measured by Concentration Ratio (CR) and profitability by ROA, ROE, and NIM?

1.4.2 Research Hypothesis

Research Hypothesis

H1: The real GDP growth is expected to have a positive effect on profitability of commercial banks of Ethiopia.

H2: Inflation is expected to have a positive effect on profitability of commercial banks of Ethiopia.

H3: Interest rate is expected to have a positive effect on profitability of commercial banks of Ethiopia.

H4: Exchange rate is expected to have a positive effect on profitability of commercial banks of Ethiopia.

H5: Concentration ratio is expected to have a negative effect on profitability of commercial banks of Ethiopia.

1.5 Significance of the study

The findings of this study are particularly important for National Bank of Ethiopia's policy makers. It may contribute to the knowledge gaps in the impact of macro economy on the profitability of commercial banks. The study may also contribute to the literature as it analyses the impact of exogenous variables on banks profitability in Ethiopia. It is assumed that the variety of observations and factors that can affect banks profitability will provide a deeper insight into commercial bank performance. It is expected that the generalization of the findings will be possible and the observations that will be obtained herein will be applicable to different cases and environments. The number of observations allows the researcher to expect that the findings of the study will be applicable to different companies. The results can be important and valuable to company managers who are interested in knowing how government policies factor their returns, market requirements and company objectives. Besides, it is expected that the findings can be used by policy makers who can adjust the appropriate regulations in order to address the issues that are related to the levels of growth in enterprises.

1.6 Operational definitions

Profitability: Refers to measuring the results of a firm's policies and operations in monetary terms. These results are reflected in the firm's return on asset, return on equity, and net interest margin.

Return on Asset: Bank profitability can be measured by the ratio of the return on average assets (ROA), calculated as net profit after tax divided by average total assets.

Return on equity: ROE is more concerned about how much the bank is earning on their equity investment, the net income per birr of equity capital.

Net interest margin (NIM): is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is usually expressed as a percentage of what the financial institution earns on loans in a time period and other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which it earned income in that time period (the **average earning assets**).

Gross domestic product (GDP): is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.

Interest rate: is the rate at which interest is paid by borrowers (debtors) for the use of money that they borrow from lenders (creditors). Specifically, the interest rate is a percentage of principal paid a certain number of times per period for all periods during the total term of the loan or credit.

Inflation rate: is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling.

Exchange rate: is the price of a nation's currency in terms of another currency i.e., American dollar for this study.

Concentration Ratio (CR): The concentration ratio is defined as the ratio of the largest banks' assets to the total assets of the entire banking sector.

1.7 Scope and Limitation of the study

The study tries to investigate the profitability of commercial banks in Ethiopia. It focuses only on the external factors that determine the profitability of commercial banks in Ethiopia. As such it includes both the private and government owned commercial banks. However, the period is from 1990 to 2013.

This study emphasizes on secondary data that is restricted to information obtainable from the yearly financial statement of banks. The number of years for which data was used is limited due to availability of data. The study considers only some of the external factors; regulation for

example may affect the profitability of commercial banks but not included due to time constraint. There could also be reliability issue on the accuracy of the financial data available but the researcher tried to minimize this problem by using audited financial statements of the commercial banks obtained from NBE and respective annual reports of the commercial banks. Another limitation is the researcher used average values in calculating ROA, ROE, NIM etc which may affect the findings if all individual data of each bank may be used. The multiple linear regression models was used on time series base and could also be seen by panel method. This might also affect the result of the study.

1.8 Organization of the Study

This paper consists of five chapters with different sections and sub-sections and it was structured as follows. Chapter one presents the introduction for the main part of the paper. Chapter two presents empirical and theoretical review of the literature related to the issue of determinants of bank profitability; Chapter three provides research design and methodology employed in the analysis was described; Chapter four contains results and discussion; and Chapter five gives summary, conclusion and recommendations. A “Reference” of related literature is referred while writing the paper and appendices are included after chapter five.

Chapter Two

2 Literature Review

2.1 Theoretical Literature

Financial performance analysis of commercial banks has been of great interest to academic research since the Great Depression Intern the 1940's. In the last two decades studies have shown that commercial banks in Sub-Saharan Africa (SSA) are more profitable than the rest of the world with an average Return on Assets (ROA) of 2 percent (Flamini et al., 2009). One of the major reasons behind high return in the region was investment in risky ventures. The other possible reason for the high profitability in commercial banking business in SSA fore example is the existence of huge gap between the demand for bank service and the supply thereof. That means, in SSA the number of banks are few compared to the demand for the services; as a result there is less competition and banks charge high interest rates. This is especially true in East Africa where the few government owned banks take the lion's share of the market (lessah, 2015).

From the literature, bank profitability is measured by: return on assets (Flamini et al.,2009;Oladele et al.,2012),return on equity(Saona, 2011)or the net interest margin (Naceur& Goaid,2008; Naceur&Omran, 2011; Sufian& Habibullah,2009). Bank profits are explained by both internal and external determinants. The empirical findings are not conclusive on the effects of the various variables contained in each category on the performance of commercial banks. Several theories suggest factors that determine bank profits. The signaling theory (Berger, 1995), The expected bankruptcy cost theory and risk-return theory (Olweny and Shipo, 2011), argue that there is a positive relationship between a bank`s profits and its level of capital.

The signaling theory argues that a higher capital signals positively to the market on the value of the bank. The positive signal provides private information to the bank to enhance capital as the future prospects are good (Berger, 1995).However, Bankruptcy Theory argues that in a situation where bankruptcy costs are unexpectedly high, banks will hold more equity to avoid a period of distress (Berger, 1995). Contrary to the above theories, the Risk Return Theory argues that capital and bank profitability are negatively associated (Saona, 2011, Ommeren, 2011). The Risk Return Theory argues that increasing risks by increasing leverage of the bank leads to higher

expected returns. This suggests that if a bank intends to increase its profits by increasing leverage, the equity to asset ratio (capital) has to be reduced. Other theories that suggest the determinants of bank profitability are the Market Power and Efficiency Structure theories. Market Power suggests that performance of banks is determined by market structure of the industry.

The Efficiency Theory argues that banks earn more profits because they are more efficient in their operations than its competitors (Olweny and Shipo, 2011) which leads to low operational costs and high profits (Zouari, 2010)

From the literature, the determinants of bank profitability are divided into two: those which can be controlled by the management, and those which are beyond the control of bank management. The factors that can be controlled by the management are called internal factors while those outside their control are called external factors. The internal determinants of bank profitability reflect the banks' management policies and decisions made on sources and uses of funds, capital, liquidity management and expenses management. This information is usually available on the bank's balance sheet and in the profit and loss accounts.

According to Nassredin (2013), the external determinants of bank profits are related to both the economic and legal environment in which the banks operate. The environmental factors include market structure, regulation, inflation, interest rates, market growth, and the general economic conditions such as economic booms or recessions (Short, 1979, Bourke, 1989, Molyneux and Thornton, 1992).

2.1.1 Theories on Bank Performance -Profitability

2.1.1.1 Market Power (MP) and Efficiency Theories

A more organized study of bank performance started in the late 1980's (Olweny and Shipo, 2011) with the application of Market Power (MP) and Efficiency Structure (ES) theories (Athanasoglou et al., 2005.) The MP theory states that increased external market forces results into profit. Moreover, the hypothesis suggest that only firms with large market share and well differentiated portfolio (product) can win their competitors and earn monopolistic profit. The market power hypothesis asserts that increased market power yields monopoly profits. A special case of the MP hypothesis is the Relative-Market-Power (RMP) hypothesis, which suggests that

only firms with large market shares and well-differentiated products are able to exercise market power and earn non-competitive profits (see Berger, 1995a).

2.1.1.2 Market Structure: Structure -Conduct -Performance Paradigm (SCP)

The relationship between performance and market structure on the banking industry is based on the development of the theory in the industry organization. There are two competing hypotheses as to the relationship between profitability and market structure as discussed in the literatures.

The first is the traditional market structure- conduct-performance (SCP) or collusion hypothesis following the eminent work by Bain (1951) which postulates that market structure influences conduct of firms through prices or investment policies and this in turn translates into performance. This hypothesis asserts that the setting of prices that are less favorable to consumers (lower deposit rates and higher loan rates) in more concentrated market as a result of competitive imperfections in these markets (Berger 1995).The relationship between market structure and performance has been treated within the framework of Structure-Conduct-Performance (SCP) paradigm. The original model SCP interprets performance as a result of the exogenous structure of the market which influences banks' conduct.

The SCP paradigm assumes that a higher bank concentration allows a higher degree of cooperation between them. These banks might set higher prices and consequently gain substantial profits (Mason, 1939; Bain, 1951; Stigler, 1964; Heggsted, 1977; Clark, 1986; Ahmed and Khababa, 1999; Sathye, 2005; Samad, 2008; Alzaidanin, 2003; Pilloff and Rhoades, 2002; Farooq, 2003; Maudos and Fernandez de Guevara, 2007; Al-Muharrami and Matthews, 2009). Demsetz (1973) was the first to formulate an alternative explanation on market structure-performance relationship and proposes the Efficiency Hypothesis. Applied to banking sector, this hypothesis stipulates that a bank which operates more efficiently than its competitors gains higher profits resulting from low operational costs. The same bank holds an important share of the market. Consequently, differences at the level of efficiency create an unequal distribution of positions within the market and an intense concentration. Since efficiency determines market structure and performance, the positive relationship between these two seems superficial.

On the other hand, the traditional hypothesis was challenged by the efficient market hypothesis, which by some authors is referred to as the efficient structure hypothesis. The hypothesis is

following the works of Demsetze (1973), which postulates that market concentration is not a random event but rather the result of the superior efficiency of the leading firms. Firms possessing a comparative advantage in production become large and obtain a high market share and, as a consequence, the market becomes more concentrated, Smirlock (1985).

2.2 Empirical Studies

Numerous studies exist on banks profitability based on the types of bank and number of countries included in the study sample. ROA and ROE have been considered in most countries of the world as proxies for profitability. Mamatzakis and Remoundos (2003) studied seventeen (17) Green commercial banks using bank data from 1989-2000. Their findings showed no considerable link of Real interest rate with ROE and ROA of banks. Also, Ahtanasoglou, brissimis, and Delis (2005) carried out a research on Greek banks using GMM estimator approach which revealed a significant positive effect of interest rate and inflation on profitability.

Demirguc-Kunt and Detragiache (1998) used a multivariate logit model in the year 1980-1994 on 45-65 developing and developed countries; result showed a significant impact of external factors towards banking sector failure. Naceur (2003) studied Tunisian banking sector profitability. A sample of Ten (10) major deposit banks was used from 1980 to 2000. The balanced panel data was applied and findings showed no Impact of inflation rate and annual growth rate on banks in Tunisia.

Demirguc-Kunt and Huizinga (1999), using bank level data for 80 countries in the 1988-1995 periods, showed that differences in interest margins and banks' profitability reflect a variety of determinants: the characteristics of the bank, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators. Athanasoglou et al. (2005) studied 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. The results indicated that all bank-specific determinants, with the exception of size, affect bank profitability significantly in the anticipated way. This implicitly indicates that the external factors were insignificant.

Staikouras and Wood (2004) constructed the OLS and fixed effect models to examine the determinants of European bank profitability from 1994 – 1998. The authors found that the profitability of European banks are influenced not only by factors related to their management decisions but also to changes in the external macroeconomic environment. Khrawish (2011) accessed the Jordanian commercial bank profitability from 2000 through 2010, and categorized the factors affecting profitability into internal and external factors. The author found that there is significant and positive relationship between return on asset (ROA) and exchange rate of the commercial banks and that there is significant and negative relationship between ROA of the commercial banks and annual growth rate for gross domestic product and inflation rate.

Dietrich and Wanzenrid (2009) analyzed the profitability of commercial banks in Switzerland over the period 1999 to 2006. Their findings revealed that the most important factors are the GDP growth rate variable which 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.

Macit (2011) investigated the bank specific and macroeconomic determinants of profitability of banks for Turkish banking sector using ROA and ROE. The result is consistent with the study by Davydenko (2010) in the Ukraine. Riaz (2013) investigated the impact of macroeconomic indicators on the profitability of banks in Pakistan during the period of 2006- 2010. When ROA is taken as a dependent variable, he determined that the interest rate has a significant influence on the commercial banks' profitability in Pakistan. The results also indicate that bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansions.

On the other side there are findings that favor internal determinants than external as a major factor of profitability. Olweny and Shipho (2011) evaluated the effects of banking sectoral factors on the profitability of commercial banks in Kenya, using panel data from 2002 to 2008 of 38 commercial banks. The authors concluded that the bank-specific factors are more significant factors influencing the profitability of commercial banks in Kenya than market factors. The study revealed that profitable commercial banks are those that strive to improve their capital bases, reduce operational costs, improve assets quality by reducing the rate of non-performing loans,

employ revenue diversification strategies as opposed to focused strategies and keep the right amount of liquid assets.

Aburime (2008) investigated the determinants of bank profitability in Nigeria, using a panel data from 1980-2006. He found that real interest rates, inflation, monetary policy, and exchange rate regime are significant macroeconomic determinants of bank profitability in Nigeria, while banking sector development, stock market development, and financial structure are insignificant.

Recent research testing the market power and the efficient structure hypotheses have expanded to various regions in the world including developing nations. Only a handful of recent studies test market power versus efficiency hypotheses in the Latin American banking sector and most of them are country-specific. Moreover, only a limited number of those studies uses sophisticated techniques to measure X- and scale efficiencies⁴ (e.g., Carvallo and Kasman, 2004; Wong, 2004). Berstain and Fuentes (2005) study the relationship between banking concentration and price rigidity in Chile for the period of 1995 to 2002. They find that greater concentration in the banking sector in Chile has generated more rigidity in the deposit rates. Their findings are interpreted as being broadly in line with the SCP argument. Guerrero et al. (2005) study the Mexican banking industry focusing on 19 banks for the period 1997 to 2003 and find evidence in support of the RMP hypothesis, thus rejecting the SCP and efficient structure models.

Most early research into the determinants of the performance of banks such as Bourke (1989) and more recently Mamatzakis and Remoundos (2003) was based on the structure–conduct–performance (SCP) paradigm. They focused on the interpretation of a positive empirical relationship between concentration market and profitability. This hypothesis states that bank performance depends on various elements of market concentration, market structure, number and size of banks, and collusion. The more concentrated the market, the less the degree of competition and higher profitability. Goddard et al (2004a) found a positive relationship between market concentration and profitability. Smirlock (1985), On the other hand, reports that concentration has no significant effect on profitability. However, he argues that market share

affects profitability positively, implying that market share has effect on profitability rather than market concentration.

Summarizing the empirical findings, profitability of commercial banks across different countries is of two categories; the internal and the external determinants. The scope of this research however, is limited to macroeconomic perspectives. The reason being, a lot of these macroeconomic factors (which covers monetary and fiscal discipline such as inflation, GDP and interest rates) keep on changing and such frequent changes could affect banks' overall profitability which, in turn, could give an impact to the general economy of a country. In short, the determinants of profitability of the banking sector might change if the macroeconomics and legal environment changes as well (Alper and Anbar, 2011). In addition, previous studies revealed that these macroeconomic factors have significantly contributed to the development of financial market in some countries such as Turkey (Alper and Anbar, 2011), Nigeria (Aburime, 2008), Macao (Vong and Chan, 2009), Tunisia (Naceur and Goaid, 2003) and Middle East countries (Bashir, 2000).

2.3 Conceptual Framework

Different empirical evidences suggest that profitability of financial institutions specifically banks is affected by internal and external factors. This study used external determinants of bank profitability which includes; Real GDP Growth Rate, Inflation, Real Lending Interest Rate, Exchange Rate and Concentration Ratio as explanatory variables. The dependent variables are ROA, ROE and NIM. The conceptual frame work for the variables are as follows.

2.3.1 Gross Domestic Product (GDP)

Macroeconomic conditions affect banking profitability in a number of ways. Firstly, there will be a higher demand for bank credit in times of economic boom than in times of recession. Economic growth is measured by the real GDP sector profitability (e.g. Belayneh (2011), Andreas and Gabrielle (2009), and Athanasoglou et al. (2008). Accordingly, they expect a

positive relationship between bank profitability and GDP development as the demand for lending is increasing (decreasing) in cyclical upswings (downswings).

Based on the frame work the current economic growth of Ethiopia may make commercial banks more profitable because a high aggregate growth rate may strengthen the debt servicing capacity of domestic borrowers, and therefore, contribute to less credit risk. Alternatively, adverse macroeconomic conditions hurt banks by increasing the amount of non-performing loans. Thus, it is expected that an improvement in economic growth enhance bank performance.

2.3.2 Bank concentration

The bank concentration variable is defined as the ratio of the largest banks' assets to the total assets of the entire banking sector. Market structure in the banking industry is measured by bank concentration ratio. According to the structure conduct theory, banks in highly concentrated markets earn monopoly rents, as they tend to collude (Gilbert 1984). As collusion may result in higher rates being charged on loans and lower interest rates being paid on deposits, a higher bank concentration have a positive impact on profitability. On the other hand, a higher bank concentration might be the result of a tougher competition in the banking industry, which would suggest a negative relationship between profitability and market concentration as stated in (Boone and Weigand 2000). As a result, the overall effect of market concentration on banking performance is undetermined.

2.3.3 Inflation

High inflation is associated with higher costs as well as higher income. If a banks income rises more rapidly than its costs, inflation is expected to exert a positive effect on profitability. Several economists have found that countries with high inflation rates have inefficiently small banking sectors and equity markets. This effect suggests that inflation reduces bank lending to the private sector, which is consistent with the view that a sufficiently high rate of inflation induces banks to ration credit as stated by John H. B and Bruce C. (2006). High doses of inflation may result in chain of events that ultimately leads to underdeveloped economic growth. The chain begins when high inflation lowers the real return on assets. Inflation is negatively associated with real money market rates, real Treasury bill rates, and real time-deposit rates; i.e., as inflation increases the real rate of return increases.

In Ethiopia too, inflation does appear to have a negative impact on bank profitability measures. According to access capital research (2010), private banks in Ethiopia are sometimes seen as generating “excessive” profits given the year-after-year returns of 25-30 percent that have been provided to shareholders for more than a decade now. However, seen from several perspectives, it is not at all apparent that banks’ profit levels should be seen as excessive. For example, real returns after accounting for the high inflation of the past five years are only in the range of 5%-10% per annum as annual inflation averaged 19% in the last five years.

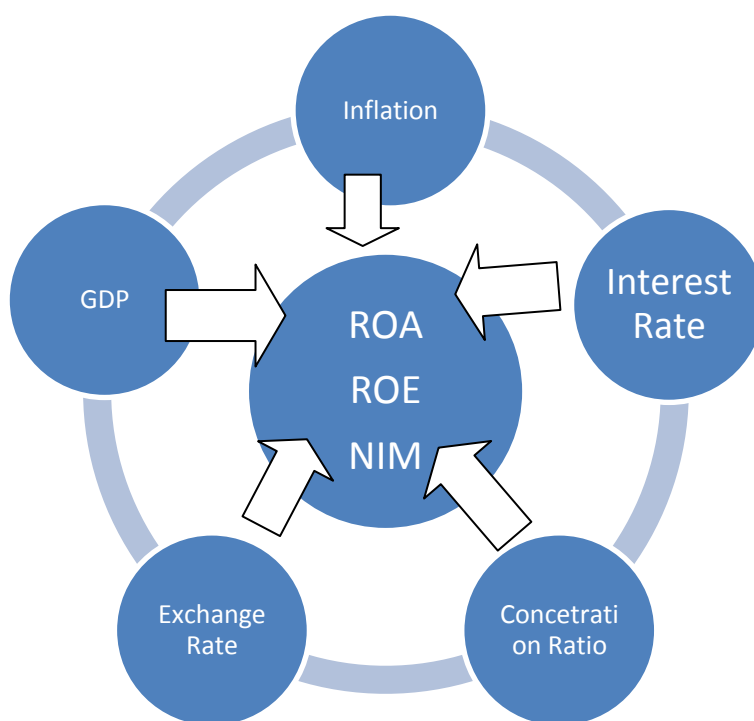


Figure 1 Conceptual Framework External Determinants vs Profitability of Commercial Banks

Source: Researcher’s own Mapping

Chapter Three

3 Research Design and Methodology

3.1 Research Design

Data of the external determinants are obtained from secondary sources particularly NBE annual reports, NBE Bank supervision directorate, Ministry of Finance and Economic Development reports, and various International organizations articles and reports such as IMF and World Bank, African Development Bank, CIA fact sheet, previous Research studies etc. However, majority data was taken from NBE. In addition local news papers were also used in getting valuable and more recent information. This study, uses data from 1985-2013. The selection of the year 1985 as a starting point is based on availability of data and also as a time series data the longer the time period the better the result will be.

In the Ethiopian banking industry there exists only two form of bank ownership: either banks that are fully owned by the government or fully owned by the private sector (businesses and individuals). No hybrid form of the two forms of ownership or the involvement of foreign ownership exists following the ban of foreign participation in the financial sector. Based on such classification there are three government owned banks of which two of them are established for commercial purpose.

3.2 Sampling Design

The purpose of the present study is to evaluate the performance of the commercial bank of Ethiopia. The researcher used purposive sampling method .The study tries to capture the overall banking industry by using the average values of all the banks in operation in the respective period for each dependent and independent variable. In addition for the macro economic variables (Inflation, GDP, Interest Rate and Exchange Rate) a trend analysis was also used in order to get their overall movement across time.

3.3 Model Specification

In order to establish which of variables are key drivers of the commercial banks „profitability in the Ethiopian Banking industry, the estimation of the coefficients has been done in three parts.

The classification is based on the three dependent variables. The purpose of separately evaluating the model is to identify the model that remained key drivers of Bank's profitability in Ethiopia. From the research methodology, the model for external determinants shall contain Return on Asset (ROA), which represents commercial banks profitability as the dependent variable. The explanatory variables include gross domestic product (GDP) measured by Real GDP Growth Rate, interest rate measured by Real Interest Rate (Lending), inflation measured as General inflation, Exchange Rate (Average) and Concentration (CR) as the independent variables. A multiple linear regression model was used to test the relationship between bank profitability and the external determinants. The linear equation relating performance measures to the independent variables is as shown below:

$$\text{ROA Model } ROA_t = \beta_{0a} + \beta_{1a}GDP + \beta_{2a}INTR + \beta_{3a}INF + \beta_{4a}CR + \beta_{5a}ExR + \epsilon_{ea}. \text{ Chris B. (2008).}$$

$$\text{ROE Model } ROE_t = \beta_{0e} + \beta_{1e}GDP + \beta_{2e}INTR + \beta_{3e}INF + \beta_{4e}CR + \beta_{5e}ExR + \epsilon_{ee}.$$

$$\text{NIM Model } NIM_t = \beta_{0n} + \beta_{1n}GDP + \beta_{2n}INTR + \beta_{3n}INF + \beta_{4n}CR + \beta_{5n}ExR + \epsilon_{en}.$$

Where: β_0 = Intercept; $\beta_1 - \beta_5$ = Coefficients of the independent variables as defined above; ϵ_e = error term. The subscripts a, e, and n denotes the respective dependent variables.

3.4 Variables Definition and Measurements

According to Creswell (2009), the variables need to be specified in quantitative researches so that it is clear to readers what groups are receiving the experimental treatment and what outcomes are being measured. Bank profitability is usually measured by the return on average assets, return on equity, and net interest margin which are expressed as a function of internal and external determinants. The internal determinants include bank-specific variables. The external variables reflect environmental variables that are expected to affect the profitability of banks. In this paper external variables are used to investigate the determinants of private commercial banks profitability.

3.4.1 The Dependent Variables

Bank profitability was measured by Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). All profitability measures included in the study are described as follows.

3.4.1.1 **Return on Asset (ROA):**

As Golin (2001) points out, the ROA has emerged as key ratio for the evaluation of bank profitability and has become the most common measure of bank profitability. The following authors also used ROA as a measure of bank profitability (Yuqi Li (2006), Abebaw and Depaack (2011), Berger (1995), Indranarain Ramlall (2009), Imad et al. (2011), Tobias and Themba (2011), Belayneh (2011), and Athanasoglou et al. (2008)). 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. Year-end total assets were used in this study in calculating ROA.

3.4.1.2 **Return on Equity (ROE):**

Return on Equity (ROE) is net income per birr of equity capital. ROE were used by some of the following authors Indranarain Ramlall (2009), Bourke (1989), Molyneux and Thornton (1992), Belayneh (2011), Andreas and Gabrielle (2009), Athanasoglou et al. (2008), and Guru et al. (1999).

3.4.1.3 **Net Interest Margin (NIM)**

Another commonly watched measure of bank profitability is called the Net Interest Margin (NIM), the difference between interest income and interest expenses as a percentage of total loans and advances which includes deposits with foreign banks, treasury bills and other investments. One of banks' primary intermediation functions is to issue liabilities and use the proceeds to purchase income-earning assets. If a bank manager has done a good job of asset and liability management such that the bank earns substantial income on its assets and has low costs on its liabilities, profits will be high. NIM was used as a measure of bank profitability by James Nguyen (2006), Ho and Saunders (1981), Angbazo (1997), Levine (2004), and Claeys et al, (2004).

3.4.2 **The Independent Variables:**

The independent variables are external determinants of bank profitability. These are factors that are beyond the control of a bank's management. They represent events outside the influence of

the bank, (Al-Tamimi, 2010; Aburime, 2005). The two major components of the external determinants are sector specific and macroeconomic factors.

3.4.2.1 *Sector Specific Determinants*

3.4.2.1.1 Concentration Ratios of the Banking Sector

The concentration ratio measures the degree of bank concentration taking into account the K-banks in the banking sector. The K-bank concentration ratios used in the study is 3BCR. In the 3BCR, the largest three banks in the sector on total deposits and total assets are taken into account.

3.4.2.1.2 Macro Economic Variables

There is wide variety of literatures that support the impact of the macroeconomic factors on bank performance. The macroeconomic policy stability, Gross Domestic Product Growth Rate, Inflation, Interest Rate and Political instability are also other macroeconomic variables that affect the performances of banks.

3.4.2.1.2.1 Gross Domestic Product (GDP)

Most literatures support the positive impact of economic growth to Bank performance. For instance the trend of GDP affects the demand for banks asset. During boom the demand for credit is high compared to recession (Athanasoglou et al., 2005), (e.g. Belayneh (2011), Andreas and Gabrielle (2009), and Athanasoglou et al. (2008). Accordingly, a positive relationship between bank profitability and GDP is expected.

3.4.2.1.2.2 Bank concentration

According to the structure conduct theory, banks in highly concentrated markets earn monopoly rents, as they tend to collude (Gilbert 1984). As collusion may result in higher rates being charged on loans and lower interest rates being paid on deposits, a higher bank concentration have a positive impact on profitability. On the other hand, a higher bank concentration might be the result of a tougher competition in the banking industry, which would suggest a negative relationship between profitability and market concentration as stated in (Boone and Weigand 2000). As a result, the overall effect of market concentration on banking performance is undetermined.

3.4.2.1.2.3 Inflation

The effect of inflation is also another important determinant of banking performance. In general, high inflation rates are associated with high loan interest rates and thus high income. Perry (1992), however, asserts that the effect of inflation on banking performance depends on whether inflation is anticipated or unanticipated. Athanasoglou et al., 2005, state in relation to the Greek situation that the relationship between inflation level and banks profitability is remained to be debatable. The direction of the relationship is not clear (Vong and Chan, 2009).

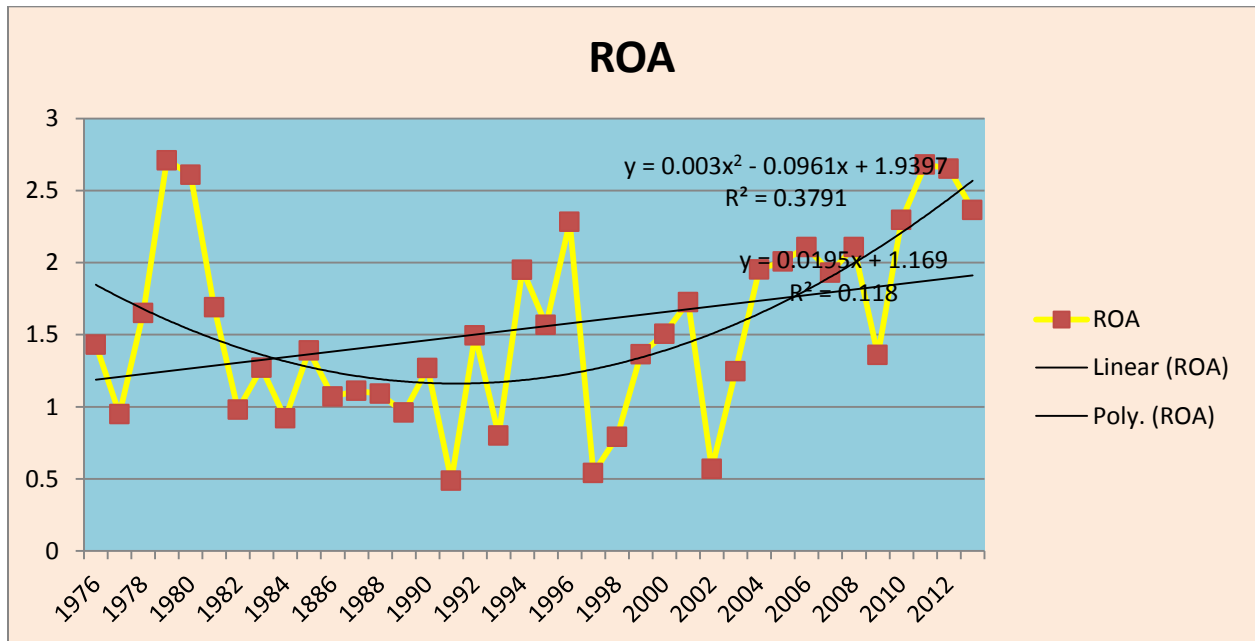
Chapter Four

4 Data Presentation and Analysis

Data was analyzed by using trend analysis, correlation analysis and multiple linear regression analysis. The first two methods i.e., trend analysis and correlation analysis were used to see general overview and progresses in each variable and their relationship across time. However, the regression analysis is the major part of the analysis and as such findings and conclusion will be drawn based on the OLS multiple regression result. While using trend analysis graphical presentations were preferred as they display progresses across time in simple and clear way. In the following sections trend analysis of all the dependent variables (ROA, ROE & NIM) and independent variables (Real Lending Interest Rate, Annual Average Exchange Rate , Real GDP Growth Rate, inflation and Concentration Ratio were presented. In addition explanations were given under each section.

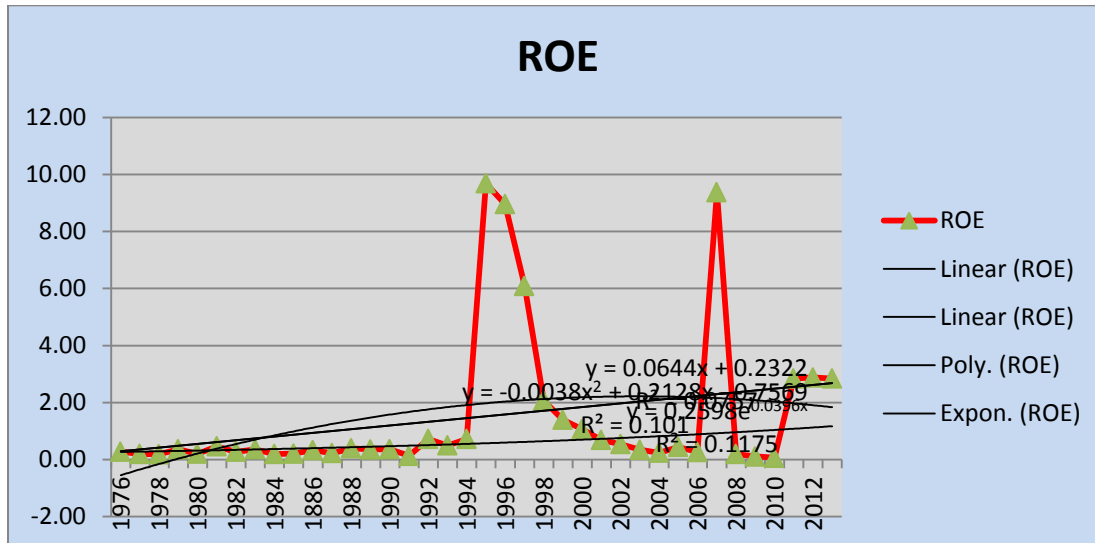
4.1 Trend Analysis

Figure 2 Trend of ROA of commercial Banks of Ethiopia



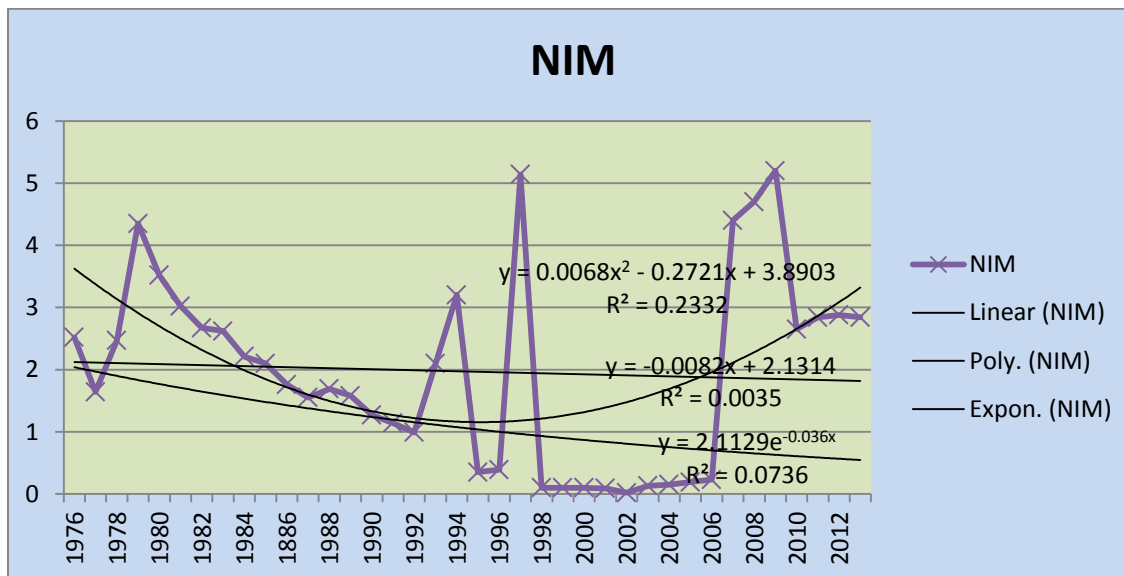
ROA of Ethiopian commercial banks has been consistently increasing with very few declines in the periods of 1990s.

Figure 3 Trend of ROE of commercial Banks of Ethiopia



ROE of Ethiopian commercial banks has been stable below one except some dramatic jump to 10 in the mid 1990s and the year 2007.

Figure 4 Trend of NIM of commercial Banks of Ethiopia



As can be seen from figure 4 above, the trend of NIM of commercial banks of Ethiopia shows no systematic pattern.

4.1.1 Trend Analysis of Real Lending Interest Rate

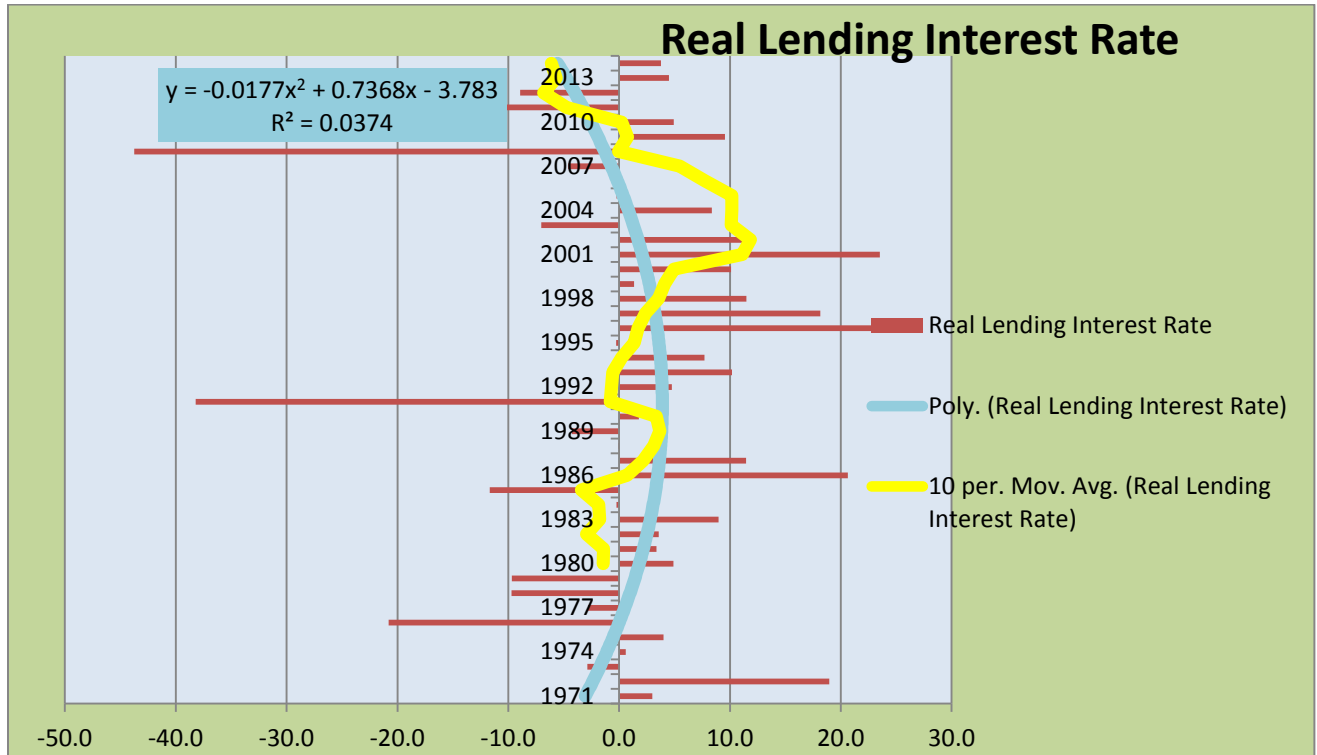


Figure 5 Trend of Real Lending Interest Rate of Ethiopia

Source: Researcher's Own Compilation

Figure 2 shows the trend of Real Lending Interest Rate of Ethiopia from 1971-2014. Data were compiled from various sources including NBE Annual Reports, IMF reports, UN reports, CIA fact sheets. From this graph we can infer that the trend of real interest rate for Ethiopia shows positive value in the period of 1995 to 2007. Before 1995 and after 2007 the real lending interest rate in general is negative which means it does not cover the cost of inflation. Despite this the Ethiopian commercial banks have been reporting profit from year to year which may indicate that the real source of profit for them is not only income from lending but also other non interest rate earnings such as money transfers and others.

The movement from time to time could be more explained by moving Average than other methods such as linear, of exponential or logarithmic trend. Generally, we can see that real interest rate moves up and down due to the effect of inflation. Real interest Rate was

exceptionally negative for three periods i.e., 1976, 1991, 2008 of which that of 1991 and 2008 are -40%. It was continuously negative before 1985 and continuously positive after that until 1991. After the highest drop in 1991 the real interest rate then turns to positive in the next year and continues to be positive after that until again the next highest drop of the 2008. It can be observed from the graph that for real interest rate in order to adjust itself and change direction it moves to too high to the opposite direction for a year and then becomes stable in the opposite direction for about 5 to 10 years.

Highest positive real interest rates (almost 20%) each were observed in four periods i.e., 1972, 1986, 1996, and 2001. However, the average real interest rate was 10% positive or negative. This means that the nominal interest rate was 10% lesser or higher than the inflation in average during the analysis period.

4.1.2 Trend Analysis of Nominal Exchange Rate

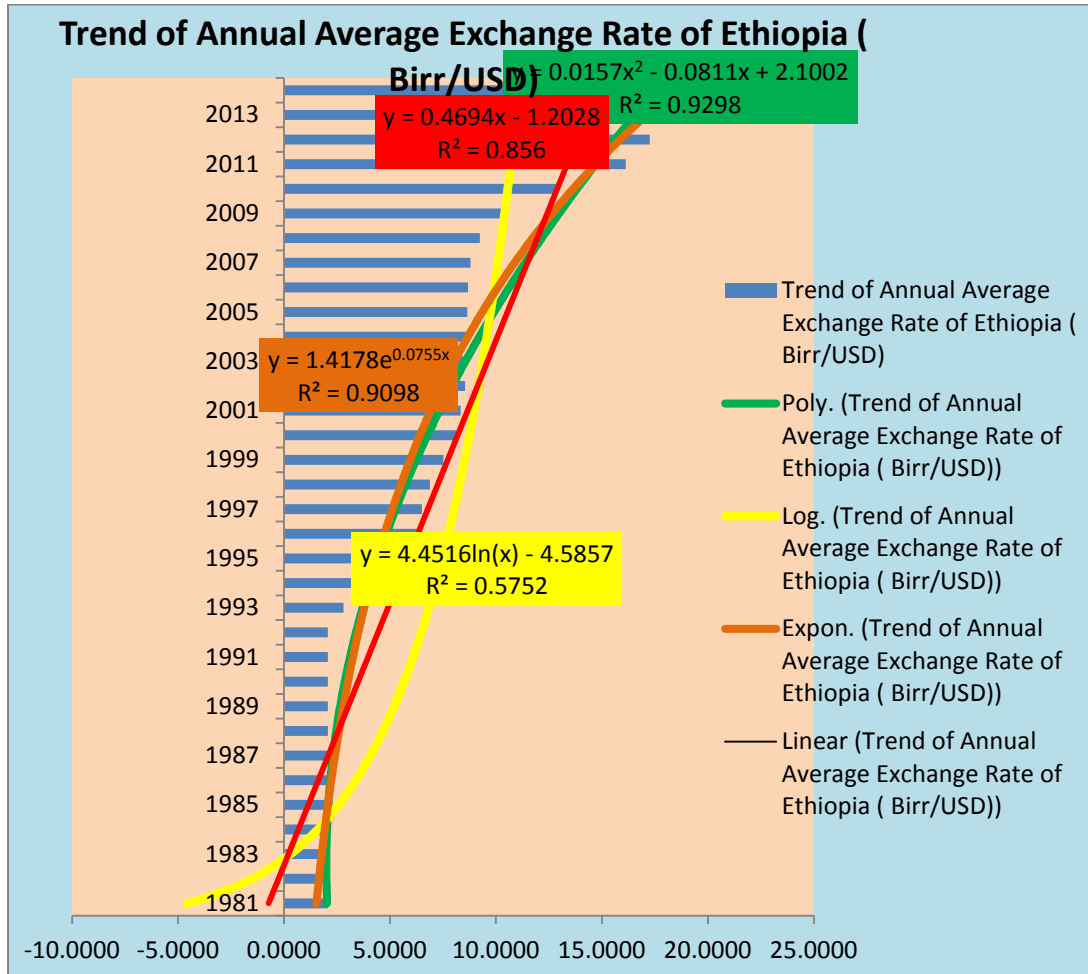


Figure 6 Trend of Exchange Rate of Ethiopia

Source: Researcher's Own Compilation

Annual average exchange rate of Ethiopia (Birr/US Dollar) as can be seen from the above figure can best be explained by polynomial function. That means it grows polynomially across time.

The rate has two periodic leaps (jumps) in the study period. The first one starts in the year 1994 and the second is in the year 2009/10 i.e., 15 years after the first devaluation.

4.1.3 Trend Analysis of Real GDP Growth Rate of Ethiopia

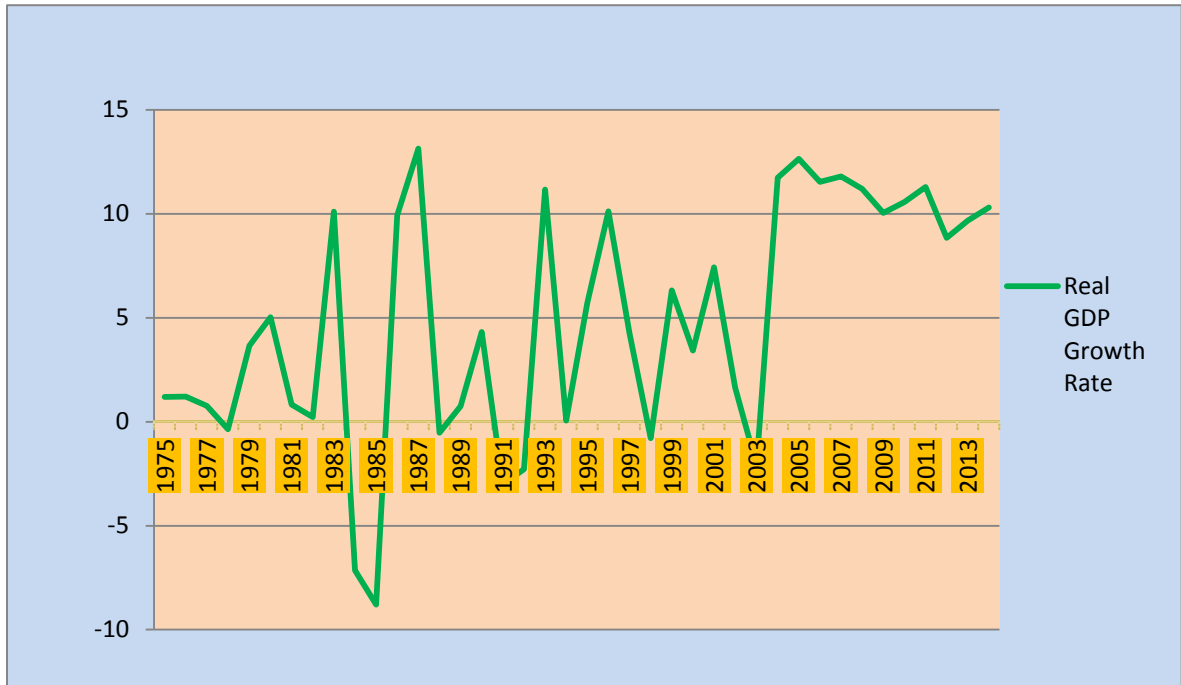


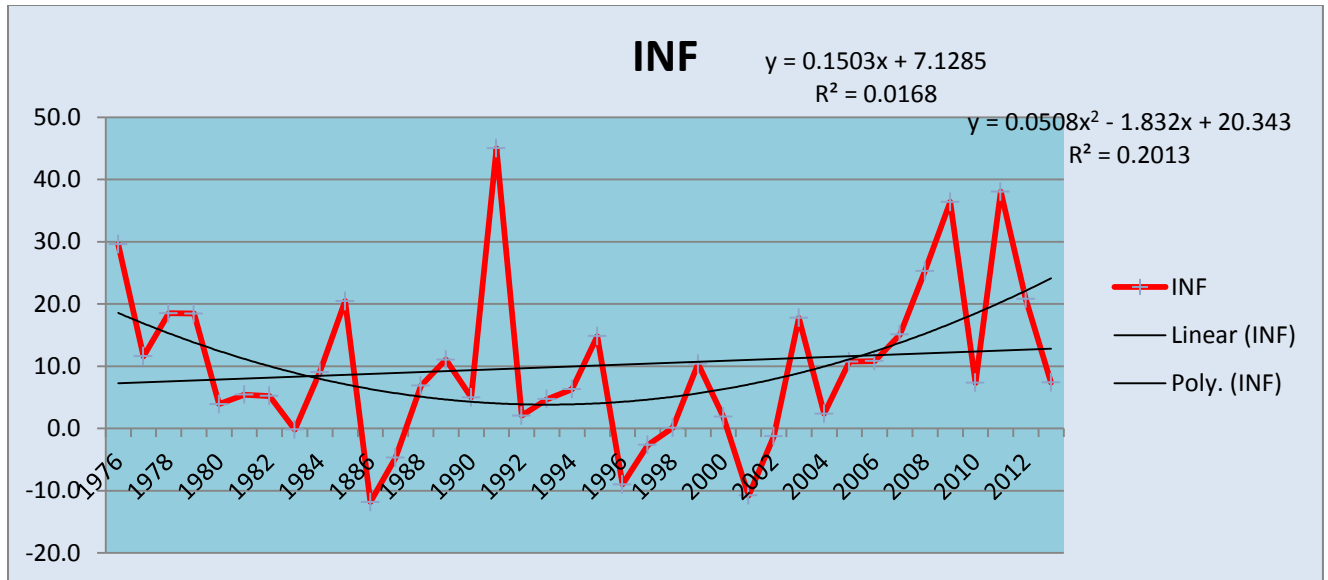
Figure 7 Trend of Real GDP Growth Rate of Ethiopia

Source: Researcher's Own Compilation

From graph above we can see that the trend in real GDP growth rate of Ethiopia shows that there had been instabilities of economic growth in Ethiopia before the year 2003 which in average cycles itself for average of every 5 year in an “M” shape i.e., up, Down and Up cycle. However, since the year 2003, growth rate have been continuous, similar in level and continuous. This could be related with the decline in real lending interest rate because during similar periods of a decade of continuous economic growth there was a continuous decline in real lending interest rate.

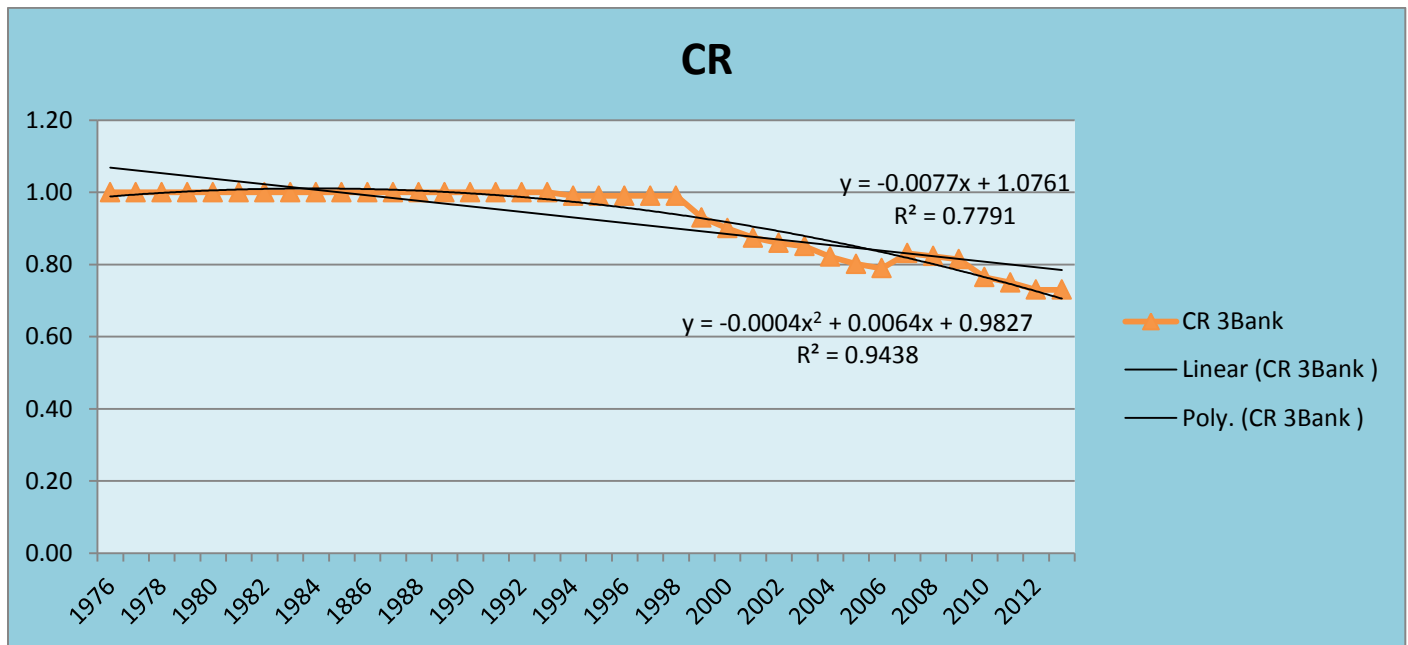
4.1.1 Trend Analysis of Inflation Rate in Ethiopia

Figure 8 Trend of Inflation in Ethiopia



The trend of CR in figure 6 above shows that inflation rate in Ethiopia shows a continuous ups and downs across years though negative values are occasional.

Figure 9 Trends Concentration Ratio



The trend of CR in figure 7 above shows that after the introduction of private banks in Ethiopia there is a continuous decline in the value of Concentration Ratio.

4.1 Correlation Analysis

4.1.1 Correlation Analysis between ROA and its Explanatory Variables

The correlation between two variables measures the degree of linear association between them. If it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. Thus, it is not implied that changes in x cause changes in y, or indeed that changes in y cause changes in x. rather, it is simply stated that there is evidence for a linear relationship between the two variables, and that movements in the two are on average related to an extent given by the correlation coefficient Chris B. (2008).

Correlations							
		ROA	GDPGR	INF	RIR	EXR	CR
ROA	Pearson Correlation	1	.565**	0.153	-0.04	.684**	-.695**
	Sig. (1-tailed)		0.001	0.214	0.422	0	0
	N	29	29	29	28	29	29
GDPGR	Pearson Correlation	.565**	1	0.162	-0.27	.374*	-.484**
	Sig. (1-tailed)	0.001		0.2	0.082	0.023	0.004
	N	29	29	29	28	29	29
INF	Pearson Correlation	0.153	0.162	1	-.594**	0.287	-.326*
	Sig. (1-tailed)	0.214	0.2		0	0.066	0.042
	N	29	29	29	28	29	29
RIR	Pearson Correlation	-0.04	-0.27	-.594**	1	0.156	0.038
	Sig. (1-tailed)	0.422	0.082	0		0.214	0.425
	N	28	28	28	28	28	28
EXR	Pearson Correlation	.684**	.374*	0.287	0.156	1	-.895**
	Sig. (1-tailed)	0	0.023	0.066	0.214		0
	N	29	29	29	28	29	29
CR	Pearson Correlation	-.695**	-.484**	-.326*	0.038	-.895**	1
	Sig. (1-tailed)	0	0.004	0.042	0.425	0	
	N	29	29	29	28	29	29
**. Correlation is significant at the 0.01 level (1-tailed).							
*. Correlation is significant at the 0.05 level (1-tailed).							

Figure 10 Correlations between ROA and its Explanatory Variables

Figure 5 above shows that there is a relatively stronger positive significant correlation (significant at 1%) between the dependent variable ROA and the independent variables GDP Growth Rate, Exchange Rate and Concentration Ratio. As expected, CR is strongly and negatively correlated with ROA (-.69 significant at 1%). This is because as CR decreases it means that the number of banks operating in the market increases meeting demands for financial services, increasing competition, encouraging efficiency and hence increases in ROA.

On the contrary, the correlation between ROA and inflation is not significant. There is almost no correlation between the ROA of the Ethiopian commercial banks and the Real interest rate of Ethiopia. When we see the correlation among the explanatory variables, there is very strong negative correlation between CR and exchange rate and also between CR and GDP growth rate at 1% significance level. In addition, CR is negatively related with Inflation at a significance level of 5%.

4.1.2 Correlation Analysis between ROE and its Explanatory Variables

Correlations

		ROE	GDPGR	INF	RIR	EXR	CR
ROE	Pearson Correlation	1	.082	-.081	.044	.134	.049
	Sig. (1-tailed)		.336	.339	.412	.244	.401
	N	29	29	29	28	29	29
GDPGR	Pearson Correlation	.082	1	.162	-.270	.374 [*]	-.484 ^{**}
	Sig. (1-tailed)	.336		.200	.082	.023	.004
	N	29	29	29	28	29	29
INF	Pearson Correlation	-.081	.162	1	-.594 ^{**}	.287	-.326 [*]
	Sig. (1-tailed)	.339	.200		.000	.066	.042
	N	29	29	29	28	29	29
RIR	Pearson Correlation	.044	-.270	-.594 ^{**}	1	.156	.038

	Sig. (1-tailed)	.412	.082	.000		.214	.425
	N	28	28	28	28	28	28
EXR	Pearson Correlation	.134	.374*	.287	.156	1	-.895**
	Sig. (1-tailed)	.244	.023	.066	.214		.000
	N	29	29	29	28	29	29
CR	Pearson Correlation	.049	-.484**	-.326*	.038	-.895**	1
	Sig. (1-tailed)	.401	.004	.042	.425	.000	
	N	29	29	29	28	29	29

*. Correlation is significant at the 0.05 level (1-tailed).

** . Correlation is significant at the 0.01 level (1-tailed).

Figure 11 Correlations between ROE and its Explanatory Variables

Figure 6 above is an output of SPSS and shows that there is significant correlation between CR ratio and ROE. The figure also shows that there is no significant correlation between the dependent variable ROE and the rest macroeconomic variables.

4.2.3. Correlation Analysis between NIM and its Explanatory Variables

Correlations							
		NIM	GDPGR	INF	RIR	EXR	CR
NIM	Pearson Correlation	1	0.081	.360*	-0.18	0.306	-0.2
	Sig. (1-tailed)		0.338	0.027	0.182	0.053	0.156
	N	29	29	29	28	29	29
GDPGR	Pearson Correlation	0.081	1	0.162	-0.27	.374*	-.484**
	Sig. (1-tailed)	0.338		0.2	0.082	0.023	0.004
	N	29	29	29	28	29	29
INF	Pearson Correlation	.360*	0.162	1	-.594**	0.287	-.326*
	Sig. (1-tailed)	0.027	0.2		0	0.066	0.042
	N	29	29	29	28	29	29

	N	29	29	29	28	29	29
RIR	Pearson Correlation	-0.18	-0.27	-.594**	1	0.156	0.038
	Sig. (1-tailed)	0.182	0.082	0		0.214	0.425
	N	28	28	28	28	28	28
EXR	Pearson Correlation	0.306	.374*	0.287	0.156	1	-.895**
	Sig. (1-tailed)	0.053	0.023	0.066	0.214		0
	N	29	29	29	28	29	29
CR	Pearson Correlation	-0.2	-.484**	-.326*	0.038	-.895**	1
	Sig. (1-tailed)	0.156	0.004	0.042	0.425	0	
	N	29	29	29	28	29	29
*. Correlation is significant at the 0.05 level (1-tailed).							
**. Correlation is significant at the 0.01 level (1-tailed).							

Figure 12 Correlations between ROA and its Explanatory Variables

As can be seen from figure 7 above all the exogenous variables were not significantly correlated with the dependent variable NIM except Inflation which is significant at 5%. This may show that NIM may not help as a good measure of performance indicator for commercial banks in Ethiopia. However, again the sign of CR is negative indicating the higher the CR the lower the profitability of the banks in Ethiopia.

Generally, the exogenous variables are correlated significantly with the ROA than the ROE and NIM which may indicate that ROA is a better indicator of profitability as compared to ROE and NIM.

4.1.1. Regression Analysis

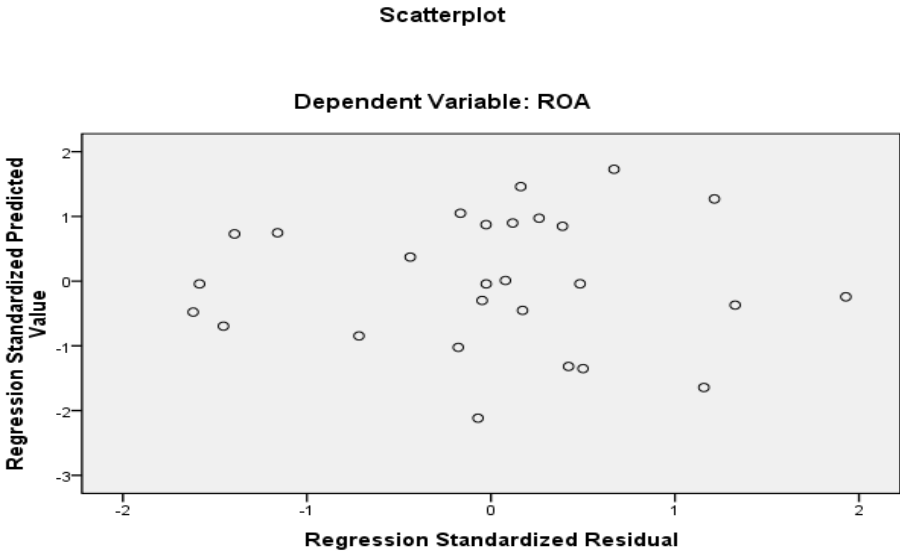
This study involves a time series study of Ethiopian Commercial Banks Average data from the year 1985 to the year 2013. Data were collected from audited financial statements of the banks obtained from NBE Banks Supervision Directorate and respective banks annual reports. In addition data was obtained from previous studies and various websites. Before running the regression it is mandatory to undertake diagnostic tests to check if any violation on the assumption of the CLRM is there.

4.1.1.1. Test for linearity Assumption

Standard multiple regression can only accurately estimate the relationship between dependent and independent variables if the relationships are linear in nature. As there are many instances where non-linear relationships occur, it is essential to examine analyses for non-linearity. If the relationship between independent variables and the dependent variable is not linear, the results of the regression analysis will under-estimate the true relationship. This under-estimation carries over-estimation for other independent variables that share variance with that independent variable.

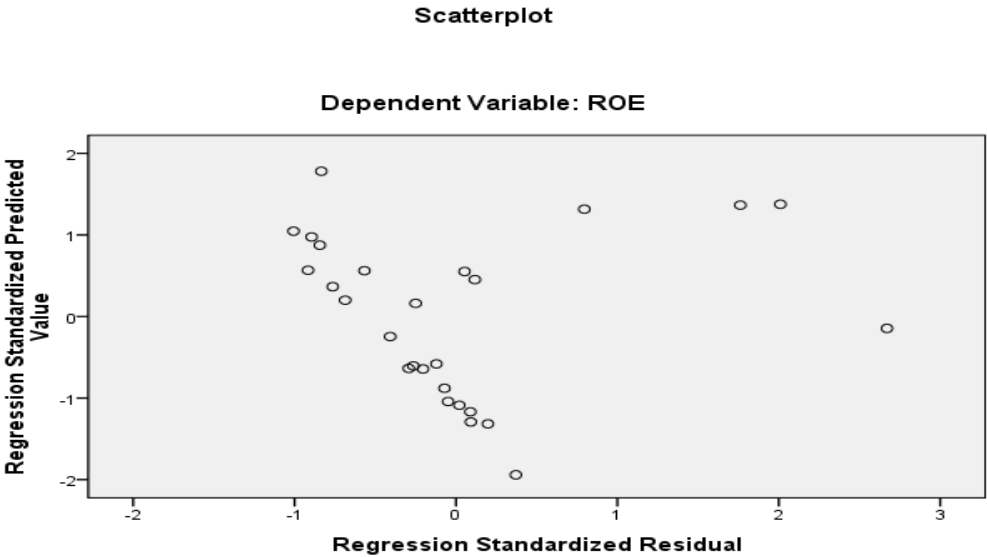
Authors such as Pedhazur (1997), Cohen and Cohen (1983), and Berry and Feldman (1985) suggest examination of residual plots (plots of the standardized residuals as a function of standardized predicted values, readily available in most statistical software.

Figure 13 Scatter Plot Standardized Residual vs Standardized Predicted (ROA)



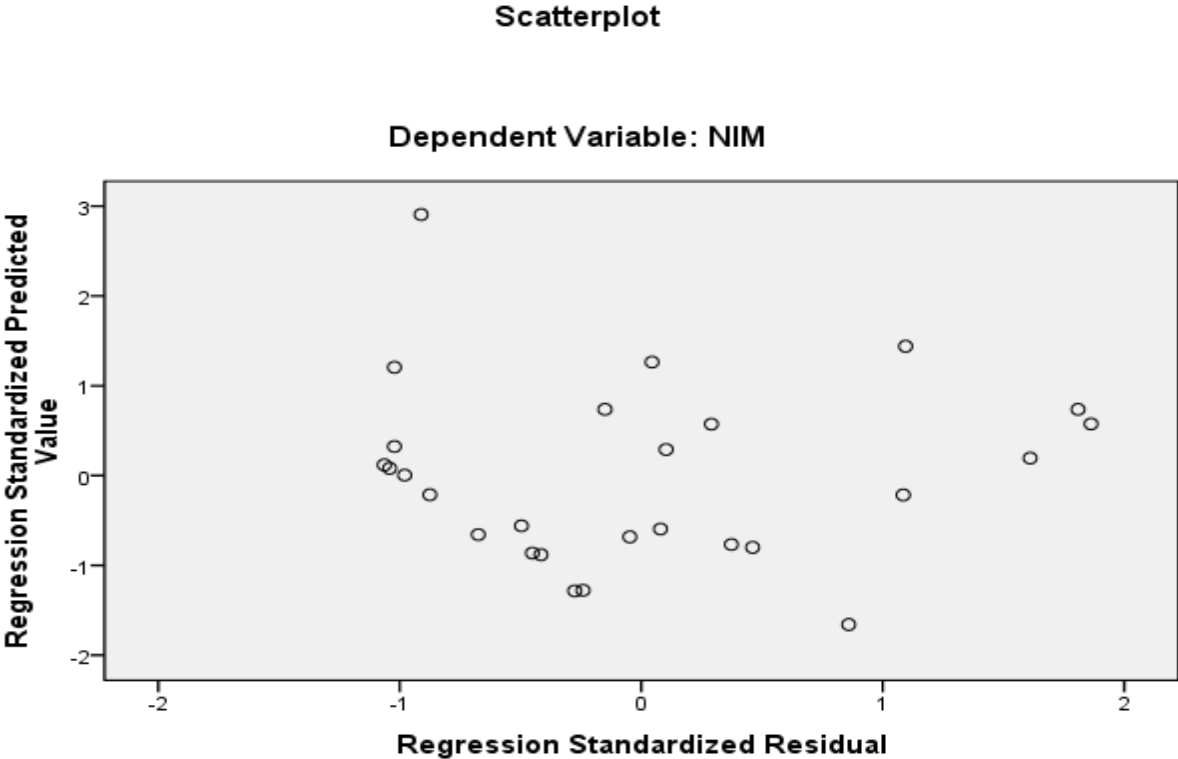
The points in figure 10 above were symmetrically distributed around a horizontal line showing that the linearity assumption for ROA is not violated.

Figure 14 Scatter Plot Standardized Residual vs Standardized Predicted (ROE)



The points in figure 11 above were not symmetrically distributed around a horizontal line showing that the linearity assumption for ROE is violated.

Figure 15 Scatter Plot Standardized Residual vs Standardized Predicted (NIM)



The points in figure 12 above were not symmetrically distributed around a horizontal line showing that the linearity assumption for NIM is violated.

4.1.1.2. Test for Normality Assumption

Regression assumes that variables have normal distributions. Non-normally distributed variables (highly skewed or kurtotic variables, or variables with substantial outliers) can distort relationships and significance tests. There are several pieces of information that are useful to the researcher in testing this assumption: visual inspection of Histogram, skewness, kurtosis, and P-P plots give researchers information about normality, and Kolmogorov-Smirnov tests provide inferential statistics on normality. Outliers can be identified either through visual inspection of histograms or frequency distributions, or by converting data to z-scores.

The test for normality can be seen from the histogram below. Figure 8,9,10 below shows that the data with ROA, ROE and NIM as dependent variable are normally distributed. In addition P-P plots below

Figure 16 Histogram ROA

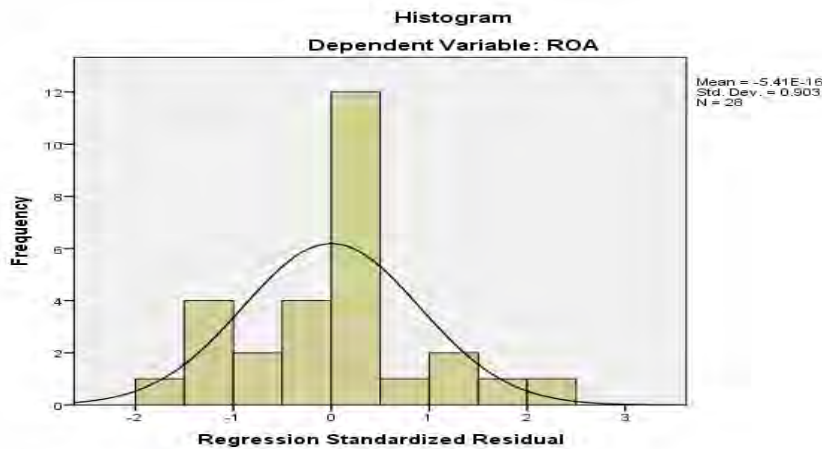


Figure 17 Histogram ROA (outlier Removed)

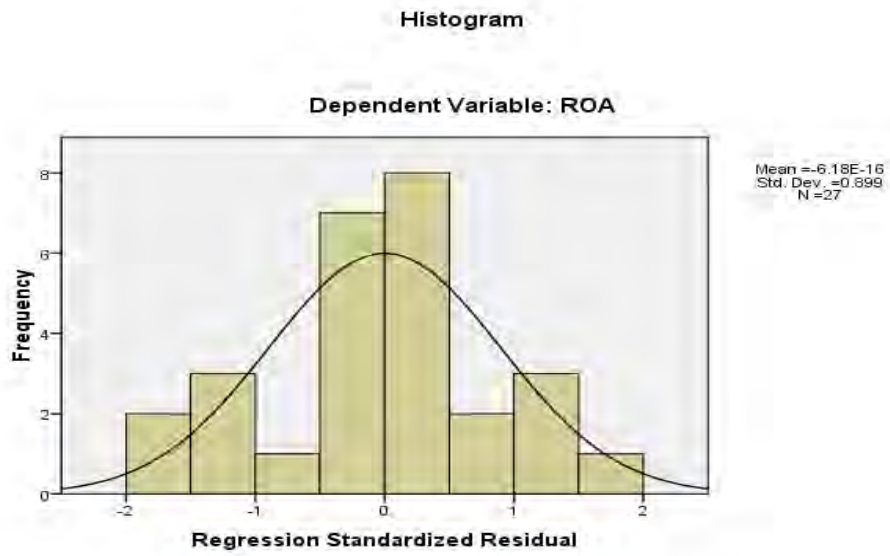


Figure 18 Histogram ROE

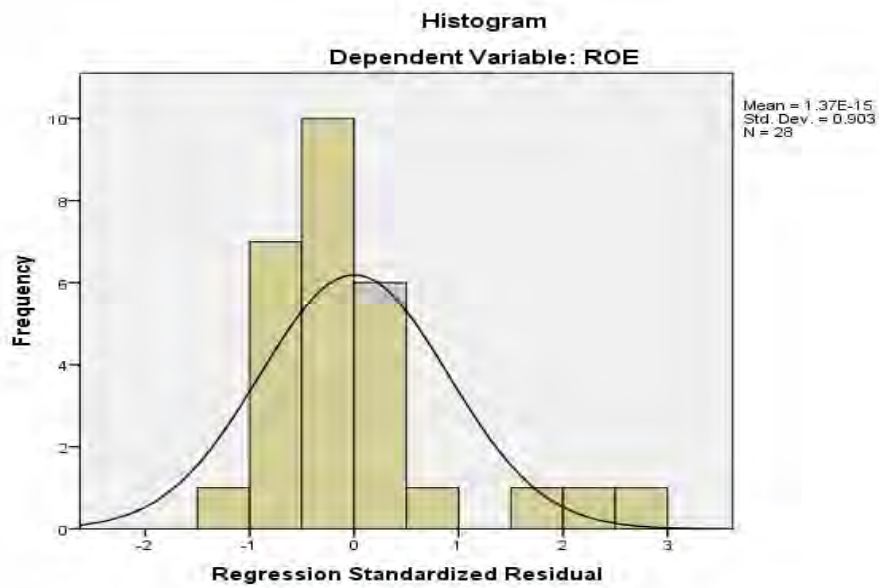


Figure 19 Histogram NIM

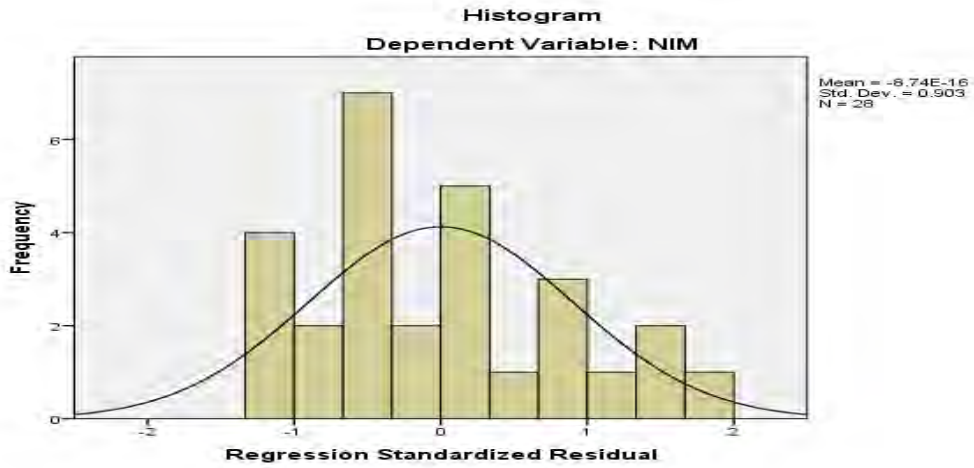


Figure 20 Normal P-P Plot ROA

Normal P-P Plot of Regression Standardized Residual

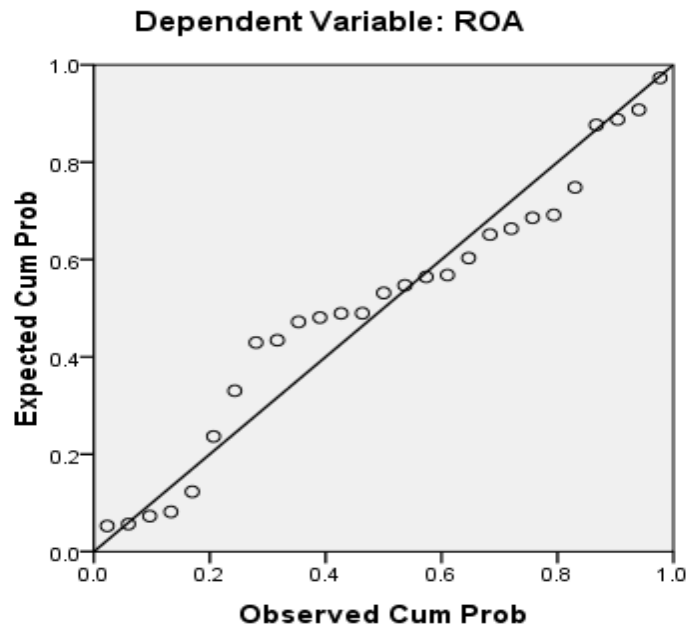


Figure 21 Normal P-P plot ROE

Normal P-P Plot of Regression Standardized Residual

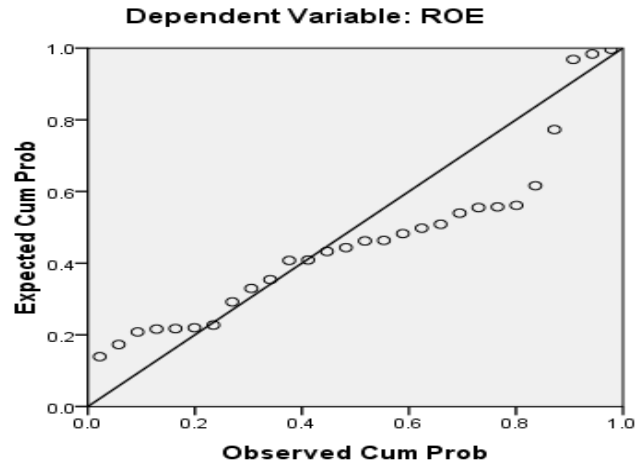
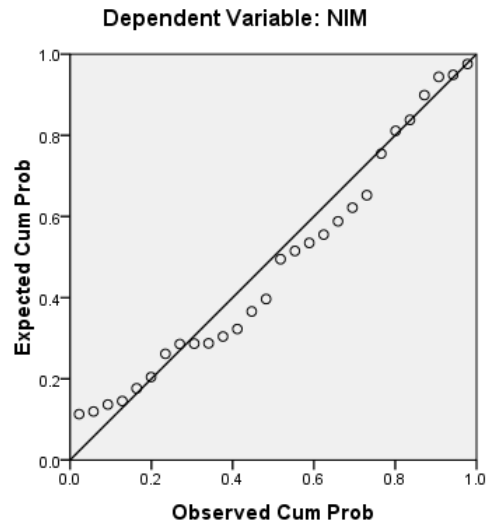


Figure 22 Normal P-P Plot NIM

Normal P-P Plot of Regression Standardized Residual



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

Dependent Variables	ROA	ROE	NIM
Bera-Jarque Test Result	1.887	1.661	1.513

Table 1 Bera Jerque Statistics Result for the Regression Models

4.1.1.3. Test for Multicollinearity

Two major methods were utilized in order to determine the presence of multi co linearity among independent variables in this study. These methodologies involved calculation of both a Tolerance test and Variance Inflation Factor (VIF) (Kleinbaum & Klein, 2002). The VIF of all the predictors is below 10 and none of the Tolerance levels is less or equal to .01. Hence, Multicollinearity was not a concern with this data set. In addition, the correlation among the explanatory variables is below 50% and significant confirming that there is no multicollinearity problem.

4.1.1.4. Test for Heteroscedasticity

The second assumption of CLRM states that the variance of the errors is constant, σ^2 this is known as the assumption of homoscedasticity. If the residuals of the regression have variability (systematically changing) over the sample, that is a sign of heteroscedasticity. White test was used for general test of heteroscedasticity. Since, the test results for three regression analysis's *p*-values are considerably in excess of 0.05, we can say that there is no evidence for the presence of heteroscedasticity.

4.1.1.5. Test for Autocorrelation

According to Andy Field (2009) the acceptable Durbin – Watson range is between 1.5 and 2.5. In this analysis Durbin – Watson values ranges from 2.019 for the model in which ROA is dependent variable; 1.513 for the model in which NIM is dependent variable and 1.611 for which ROE is the dependent variable. This shows that in all the three models the Durbin Watson is in between the acceptable ranges indicating that there was no problem of auto correlation to run the three models. Therefore, regression analysis of Predictors and Dependent variables was conducted and the results of the regression analysis are presented in the following section.

Dependent Variables	ROA	ROE	NIM
Durbin Watson Test Result	2.019	1.661	1.513

Table 2 Durbin Watson Test Result for the Regression Models

4.2 Significance Test of the Coefficients

All the predictors, when seen individually by test of coefficients (t- statistics) fail to significantly determine the profitability of commercial banks in Ethiopia i.e., not significant at even 10% significance level.

4.2.1 T-test for coefficients (ROE as Dependent Variable)

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-33.071	14.409		-2.295	.032		
RIR	-.096	.091	-.318	-1.051	.305	.380	2.634
EXR	.744	.303	1.165	2.455	.022	.154	6.485
GDPGR	.074	.127	.131	.578	.569	.676	1.479
INF	-.061	.059	-.296	-1.029	.315	.421	2.375
CR	32.690	13.637	1.070	2.397	.025	.174	5.744

a. Dependent Variable: ROE

Table 3 T-Test for Coefficients (ROE as Dependent Variable)

4.2.2 T-test for coefficients (ROA as Dependent Variable)

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Co-linearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.552	2.277		.682	.503		
RIR	-.010	.014	-.156	-.692	.496	.380	2.634
EXR	.073	.048	.541	1.524	.142	.154	6.485
GDPGR	.036	.020	.299	1.766	.091	.676	1.479
INF	-.009	.009	-.199	-.929	.363	.421	2.375
CR	-.761	2.155	-.118	-.353	.727	.174	5.744

a. Dependent Variable: ROA

Table 4 T-Test for Coefficients (ROA as Dependent Variable)

4.2.3 T-test for coefficients (NIM as Dependent Variable)

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-9.724	8.135		-1.195	.245		
RIR	-.035	.052	-.205	-.675	.507	.380	2.634
1 EXR	.277	.171	.772	1.620	.119	.154	6.485
GDPGR	-.006	.072	-.020	-.087	.932	.676	1.479
INF	.024	.034	.204	.706	.487	.421	2.375
CR	10.151	7.699	.591	1.319	.201	.174	5.744

a. Dependent Variable: NIM

Table 5 T-Test for Coefficients (NIM as Dependent Variable)

The coefficient of the explanatory variable real interest rate was found to be insignificant and hence fails to determine the profitability of commercial banks in Ethiopia. This finding supports the findings by Mamatzakis and Remoundos (2003) who studied seventeen (17) Green commercial banks using bank data from 1989-2000 and found no considerable link of Real interest rate with ROE and ROA of banks. Similarly, the t statistic for the variables inflation and annual real GDP growth rate is also not significant to affect the profitability of commercial banks of Ethiopia. This finding again supports the finding by Naceur (2003) who studied Tunisian banking sector profitability by using a sample of Ten (10) major deposit banks from 1980 to 2000 with a balanced panel data method in which the findings showed no Impact of inflation rate and annual growth rate on banks in Tunisia.

4.3 Model Summary

4.3.1 ROA Model with all the Five Independent Variables

Table 6 Model Summary ROA

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.757a	.573	.476	.4488	.573	5.901	5	22	.001	2.019

All the predictors, when seen individually by test of coefficients (t- statistics) fail to significantly determine the profitability of commercial banks in Ethiopia. The coefficient of the explanatory variable real interest rate was found to be insignificant and hence fails to determine the profitability of commercial banks in Ethiopia. This finding supports the findings by Mamatzakis and Remoundos (2003) who studied seventeen (17) Green commercial banks using bank data from 1989-2000 and found no considerable link of Real interest rate with ROE and ROA of banks. Similarly, the t statistic for the variables inflation and annual real GDP growth rate is also not significant to affect the profitability of commercial banks of Ethiopia. This finding again supports the finding by Naceur (2003) who studied Tunisian banking sector profitability by using a sample of Ten (10) major deposit banks from 1980 to 2000 with a balanced panel data method in which the findings showed no Impact of inflation rate and annual growth rate on banks in Tunisia.

4.3.1 ROA Best fit model

The model that uses ROA as dependent variable and GDPGR, Inflation, Real Interest rate, Concentration Ratio, Exchange Rate is not the best fit since the variables (except GDPGR and Concentration ratio) are insignificant. Therefore, the best fit that fulfills all the assumptions of

linear regression is the one that uses GDPGR (GDP growth rate) and Concentration Ratio as independent variables. The model summary from SPSS V.16 output is presented as follows.

Table 7 Variables Entered ROA Best Fit Model

Model	Variables Entered	Variables Removed	Method
1	CR3Bank, GDPGR ^a		Enter

a. All requested variables entered.

b. Dependent Variable: ROA

Table 8 ROA Best Fit model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.748 ^a	.559	.524	.4376639	1.951

a. Predictors: (Constant), CR3Bank, GDPGR

b. Dependent Variable: ROA

Table 9 ANOVA of ROA best fit model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.066	2	3.033	15.834	.000 ^a
	Residual	4.789	25	.192		
	Total	10.855	27			

a. Predictors: (Constant), CR3Bank, GDPGR

b. Dependent Variable: ROA

Table 10 Coefficient of ROA best fit model

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	4.077	.989		4.123	.000		
GDPGR	.044	.020	.355	2.215	.036	.689	1.452
CR3Bank	-3.096	1.013	-.489	-3.057	.005	.689	1.452

a. Dependent Variable: ROA

As can be seen from table 9 above both GDPGR and CR are statistically significant at 5% and 1% respectively.

The best fit model shows that about 56% of the total variations in average ROA of the Ethiopian banks is explained by GDP growth rate of the country and market concentration ratio of the banks.

Empirically, the best fit model is;

$$ROA = 4.077 + .044(GDPGR) - 3.096(CR)$$

Therefore, for 1% change in GDPGR of Ethiopia the Average ROA of the Ethiopian banks will change by 0.44 % in the same direction of the change. When average of concentration ratio (CR) of Ethiopian banks changes by 1%, the average ROA of Ethiopian banks change by 3.096% but in the opposite direction.

4.3.1 NIM Model with all the Five Independent Variables

Table 11 NIM model Summary (with all the Five Independent Variables)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
1	.480 ^a	0.23	0.055	1.6037968	0.23	1.316	5	22	0.294	1.513

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

Table 12 NIM dependent and CR and GDPGR independent

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	CR3Bank, GDPGR ^a		Enter

a. All requested variables entered.

b. Dependent Variable: NIM

Table 13 NIM model summary (CR & GDPGR independent variables)

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.202 ^a	.041	-.036	1.6942130	1.169

a. Predictors: (Constant), CR3Bank, GDPGR

b. Dependent Variable: NIM

4.3.2 ROE as Dependent Variable

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.486 ^a	.236	.063	2.8407799	.236	1.361	5	22	.277	1.611

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: ROE

Table 16 Variables entered for best fit model

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	CR, GDPGR ^a		.Enter

a. All requested variables entered.

b. Dependent Variable: ROE

Table 17 Model Summary for best fit model (ROE dependent variable)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.194 ^a	.038	-.039	2.9819724

a. Predictors: (Constant), CR, GDPGR

Table 18 ANOVA model (ROE dependent variable)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.693	2	4.347	.489	.619 ^a
	Residual	222.304	25	8.892		
	Total	230.997	27			

a. Predictors: (Constant), CR, GDPGR

b. Dependent Variable: ROE

Table 19 Coefficients (ROE dependent variable)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.867	6.736		-.574	.571
	GDPGR	.125	.135	.218	.924	.364
	CR	5.574	6.901	.191	.808	.427

a. Dependent Variable: ROE

As can be seen from table 14 above the coefficients of the independent variable GDPGR and CR when ROE is used as dependent variable are not significant and hence the model is not the best fit.

Chapter Five

5. Findings, Conclusion and Recommendations

5.1. Introduction

In this chapter the major findings of the study are summarized; conclusions are drawn based on the findings and recommendations are forwarded for the concerned bodies. The main objective of this study was to investigate the external determinants of profitability of commercial banks in Ethiopia. Specific objectives were to determine and evaluate the effects of sector specific and macroeconomic factors. Multiple linear regressions method was used in the analysis. In this study secondary data were used to investigate the major determinant factors of profitability of commercial banks in Ethiopia. Three regression models were run for three profitability measures; (ROA), (ROE), and (NIM) by using five independent variables. Since some of the independent variables were found to be insignificant linear regression was again run using the two significant independent variables for the three dependent variables. Only the model that uses ROA was found to be best fit model

5.2. Findings

- 5.2.1. The coefficients of both GDPGR and CR are statistically significant at 5% and 1% respectively. The R² was 0.559 which means 56% of the total variations in average ROA of the Ethiopian banks is explained by GDP growth rate of the country and market concentration ratio of the banks.
- 5.2.2. Empirically, the best fit model is; $ROA = 4.077 + .044(GDPGR) - 3.096(CR)$. Therefore, for 1% change in GDPGR of Ethiopia the Average ROA of the Ethiopian banks will change by 0.44 % in the same direction of the change. The following conclusions can be drawn from the findings.
- 5.2.3. As expected the real GDP growth was found to have a positive effect on profitability of commercial banks of Ethiopia measured by ROA.
- 5.2.4. As expected Concentration ratio was found to have a negative effect on profitability of commercial banks of Ethiopia measured by ROA.

- 5.2.5. The Inflation rate, Real interest rate and Exchange rate were not significant in determining the profitability of commercial banks of Ethiopia as per the linear regression model
- 5.2.6. The ROE and NIM model were found to be not significant in determining the relationship between profitability of commercial banks of Ethiopia and the external determinants.

5.3. Conclusion

- 5.3.1. As the number of banks operating in the country increases, then the average ROA of the commercial banks also increases. In other words, when average concentration ratio (CR) of Ethiopian banks changes by 1%, the average ROA of Ethiopian banks change by 3.096% but in the opposite direction. That means when average CR of Ethiopian commercial banks decreases by 3.1% then ROA of same increases by 1%. The implication is that as the number of banks operating in the country increases unmet demand is met and resources are efficiently utilized partly due to use of technology by the banks in order to cope up the competition among them.
- 5.3.2. From the study it can be concluded that both sector specific variables and macroeconomic variables do affect commercial banks profitability in Ethiopia.

5.4. Recommendations

- 5.4.1. In managing the effect of Concentration Ratio NBE may consider easy entry policy to the banking sector by taking proper policy measures such as low minimum capital required to establish a bank.

- 5.4.2. The exogenous variables should also be seen as a room for growth opportunity. It is the responsibility of the respective commercial bank's management to capture them and align the variables with their growth strategy. The macroeconomic determinants under study (GDPGR & CR) have a significant effect on the profitability of the commercial banks in Ethiopia. Therefore, the commercial banks should maximize this opportunity by incorporating the results of quality and professional forecasting techniques while preparing their strategic plan.
- 5.4.3. Further study by using other methods and models is recommended since the many of the variables were not explained by linear regression analysis.

REFERENCE

Aburime, U. (2005) Determinants of Bank Profitability: Company-Level Evidence from Nigeria. Nigeria: University of Nigeria, Enugu Campus.

Aburime, T.U. (2008) “Determinants of Bank Profitability: Macroeconomics Evidence from Nigeria”. Lagos Journal of Banking, Finance and Economics Available at <http://ssrn.com/abstract=1231064>

Al-Muharrami, S. & Matthews, K. (2009). “Market power versus efficient-structure in Arab GCC banking” Applied Financial Economics, Vol. 19, No. 18, pp. 1487 – 1496.

Alzaidanin, J.S. (2003). “An Investigation of Bank Profitability and Market Concentration in the United Arab Emirates Financial System”, Bangor Business School Staff Publications & Working Papers.

Alper, D., Anbar, A. (2011) “Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey” Business and Economic Research Journal Volume 2.Number 2.2011 pp.139-152 ISSN: 1309-2448

Al-Tamimi, H., Hassan, A. (2010) Factors Influencing Performance of the UAE Islamic and Conventional National Banks. . Department of Accounting, Finance and Economics, College of Business Administration, University of Sharjah.

Ani, W.U., Ugwunta, D.O., Ezeudu, I. J. & Ugwuanyi, G. O. (2012). An Assessment of the Determinants of bank Profitability in Nigeria: Bank Characteristics Panel Evidence. Journal of Accounting and Taxation, 4(3), 38 – 43.

Athanasoglou, P. P., Brissimis, S. N. & Delis, M. D. (2005). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. Bank of Greece Working Paper 25. Available at: <http://www.bankofgreece.gr/BogEkdoseis/Paper200525.pdf>

Athanasoglou, P.P., Sophocles, N.B., Matthaïos, D.D. (2005) Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Working paper, Bank of Greece. 1(1), 3-4.

Babalola, Y. A. (2012). The Determinants of Bank's Profitability in Nigeria. *Journal of Money, Investment and Banking*, 24, 6 – 16. Berger, A.N. (1995). The Relationship between Capital and Earnings in Banking. *Journal of Money, Credit and Banking*, 27, 432 – 456.

Bain, J.S. (1951). "Relation of Profit Rate to Industry Concentration", *Quarterly Journal of Economics*, Vol.65, pp.293-324.

Bashir, A.M., „Determinants of profitability and rates of return margins in Islamic Banks: Some evidence from the Middle East”, paper presented at the ERF Seventh Annual Conference, 26-29th October 2000, Amman, Jordan.

Berger (1995), " The Profit-Structure Relationship in Banking-tests of Market Power and Efficient-Structure Hypotheses" *Journal of Money, Credit, and Banking*, Vol. 27 No. 2

Berry, W. D., & Feldman, S. (1985). *Multiple Regression in Practice*. Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-050). Newbury Park, CA: Sage.

Bourke, P. (1989), "Concentration and Other Determinants of Bank Profitability in Europe, North America and Australia," *Journal of Banking and Finance*, Vol. 13, 65-79. Chris B. (2008) *Introductory Econometrics for Finance*, Cambridge University Press PP.28.

www.capitalnews.com February 25,2013

Clark, J.A. (1986). Single-Equation, Multiple Regression Methodology: Is It an Appropriate Methodology for the Structure-Performance Relationship in Banking? *Journal of Monetary Economics*, Vol.18, No.3, pp.259-312.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Demsetz, H. (1973). Industry Structure, Market Rivalry and Public Policy, *Journal of Law and Economics*, Vol.16, N.1, pp.1-9.

Emery, John T. (1971), "Risk, Returns, and the Morphology of Commercial Banking", *Journal of Financial and Quantitative Analysis*, Vol. 6, No. 2, March, pp. 763-776.

Eshete, Zerayehu Sime; Teshome, Kagnew Wolde ; Abebe, Teshome Ketama;. (2013). Competition in Ethiopian Banking Industry. *African Journal of Economics*, 1(5), 1-16

Farooq, A.M. (2003). Structure and Performance of Commercial Banks in Pakistan, State Bank of Pakistan, Munich Personal RePEc Archive Paper No. 4983.

Flamini, C., Valentina C., McDonald, G., Liliana, S. (2009) The Determinants of Commercial Bank Profitability in Sub-Saharan Africa. IMF Working Paper.

Heggsted, A.J. (1977). Market Structure, Risk, and Profitability in Commercial Banking, *Journal of Finance*, Vol.32, pp. 1207-1216

Heggsted, Arnold A. and John J. Mingo (1976), "Price, Non-prices, and Concentration in Commercial Banking", *Journal of Money, Credit and Banking*, 8 February, pp. 107-17.

Heggsted, Arnold A. (1977), "Market Structure, Risk, and Profitability in Commercial Banking", *Journal of Finance*, No. 32, September, pp. 1207-16.

IMF staff Country Report October 2012. PP 9-11.

Khrawish, H. A. (2011). Determinants of Commercial Banks Performance: Evidence from Jordan. *International Research Journal of Finance and Economics*, 81, 148-159.

Lessah, N.(2015. Effect Of Macroeconomic Variables On Profitability Of Commercial Banks Listed In The Nairobi Securities Exchange *International Journal Of Economics, Commerce And Management United Kingdom* Vol. III, Issue 4, April 2015 Christine Nanjala Simiyu School Of Business And Public Management, KCA University, Nairobi, Kenya

Lindley, James T., James A. Verbrugge, James E. McNulty and Benton E. Gup (1992), “Investment Policy, Financing Policy and Performance Characteristics of De Novo Savings and Loan Associations”, *Journal of Banking and Finance*, Vol. 16, pp. 313-330.

Macharia M. 2013 Determinants Of Profitability In The Banking Industry In Kenya: A Case Of Commercial Banks Listed On Nairobi Stock Exchange , MA thesis Nairobi. PP.6.

Mason, E.S. (1939). Price and Production Policies of Large-Scale Enterprise, *American Economic Review*, 29, 61-74.

Maudos, J., Fernandez De Guevara, J. (2007). The Cost of Market Power in Banking: Social Welfare Loss vs. Cost Inefficiency, *Journal of Banking and Finance*, Vol. 31, pp. 2103-2125. *Applied Financial Economics*, Vol. 8, pp. 191-200.

McCall, Alan S. and Manfred O. Peterson (1977), “The Impact of De Novo Commercial bank Entry”, *Journal of Finance*, Vol. 32, No. 5, December, pp. 1586-1604.

Mohammed Worku, (2015). “Ownership Structure And Financial Performance Of Ethiopian Banks: A Comparative Analysis Of Private And State Owned Banks” MBA Thesis, Addis Ababa University College Of Business And Economics Department Of Accounting And Finance ,Addis Ababa, Ethiopia

Mohammed Umar, Danjuma Ma'ijama'a, Mohammad Adamu. Conceptual Exposition of the Effect of Inflation on Bank Performance. *Journal of World Economic Research*. Vol. 3, No.5, 2014, pp 55-59.doi:10.11648/j.jwer.20140305.11

Molyneux, P. and J. Thornton. (1992). “Determinants of European bank profitability: A note. *Journal of Banking and Finance*, 16, 1173-1178 in Athanasoglou et al., 2005.

Mullineaux, Donald J. (1978), “Economies of Scale and Organizational Efficiency in Banking: A Profit-Function Approach”, *Journal of Finance*, Vol. 33, No. 1, March, pp. 259-280.

- Molyneux, Philip and John Thornton (1992), "Determinants of European Bank Profitability: A Note", *Journal of Banking and Finance*, No. 16, pp. 1173-1178.
- Naceur, S. B. & Goaied, M. (2008). The Determinants of Commercial Bank Interest Margin and Profitability: Evidence from Tunisia. *Frontiers in Finance and Economics*, 5(1), 106-130.
- Naceur, S. B. & Omran, M. (2011). The effects of bank regulations, competition, and financial reforms on banks' performance. *Emerging Markets Review*, 12(1), 1-20.
- Neeley, M. C. and D. C. Wheelock. (1997, March/ April). "Why Does Bank Performance Vary Across States?" *Federal Reserve Bank of St. Louis Review*, 79(2), 27-40.
- Oladele, P. O., Sulaimon, A. A. & Akeke, N. I. (2012). Determinants of Bank Performance in Nigeria. *International Journal of Business and Management Tomorrow*, 2(2), 1 – 4.
- Olweny, T., Shiphoo, T.M. (2011) Effects of Banking Sectoral Factors on the Profitability of Commercial Banks in Kenya. *Economics and Finance Review*, 1(5), 1-30.
- Ommeren, S. V. (2011). An Examination of the Determinants of Banks' Profitability in the European Banking Sector, An Unpublished M. Sc. Thesis, Department of Accounting and Finance, Erasmus School of Economics Erasmus University, Rotterdam.
- Ongore V.O and Kussa G.B (2013) Determinants of Financial Performance of Commercial Banks in Kenya
- Pedhazur, E. J., (1997). *Multiple Regression in Behavioral Research* (3rd ed.). Orlando, FL:Harcourt Brace.
- Philips, Almarin (1964), "Competition, Confusion and Commercial Banking, *Journal of Finance*, Vol. 19, No. 1, March, pp. 32-45.
- Pilloff, S.J., & Rhoades, S.A. (2002). Structure and Profitability in Banking markets, *Review of Industrial Organization*, Vol. 20, No.1, pp.81-98.

- Rhoades, Stephen A. (1980), "Entry and Competition in Banking", *Journal of Banking and Finance*, Vol. 4, No. 2, June, pp. 143-150.
- Samad, A. (2008). Market Structure, Conduct and Performance: Evidence From the Bangladesh Banking Industry, *Journal of Asian Economics*, Vol.19, pp.181-193.
- Sathye, M. (2005). Market Structure and Performance in Australian Banking, *Review of Accounting and Finance*, Vol. 4, No2, pp.107-122.
- Sharma, E. & Mani, M. (2012). Impact of Macroeconomic and Financial Market Indicators on the Banking Sector: Some Evidence from India. *International Journal of Research in Finance and Marketing*, 2(2), 172-185.
- Sharma, P. & Gounder, N. (2012). Profitability Determinants of Deposit Institutions in Small, Underdeveloped Financial Systems: The Case of Fiji. *Gri%th Business School Discussion Papers Finance*, No. 2012 – 06. Available at: <http://equella.rcs.gri&th.edu.au/research/items/...inancialsystems.pdf>.
- Short, Brock K. (1979), "The Relation Between Commercial Bank Profit Rates and Banking Concentration in Canada, Western Europe and Japan, *Journal of Banking and Finance*, No. 3, pp. 209-219.
- Smirlock, Michael (1985), "Evidence on the (Non) Relationship Between Concentration and Profitability in Banking", *Journal of Money, Credit and Banking*, Vol. 17, No. 1, February, pp. 69-83.
- Steinherr, A. and Ch. Huveneers (1994), "On the Performance of Differently Regulated Financial Institutions: Some Empirical Evidence", *Journal of Banking and Finance*, Vol. 18, pp. 271-306.
- Stigler, A. (1964). "A Theory of Oligopoly", *Journal of Political Economy*, Vol.72, pp. 44-61.
- Tesfaye, B. (2014) The Determinants of Ethiopian Commercial Banks Performance, *European Journal of Business and Management*, Vol. 6. No.14 2014
- Vernon, Jack R. (1971), "Separation of Ownership and Control and Profit Rates, the

Evidence from Banking: Comment”, *Journal of Financial and Quantitative Analysis*, Vol. 6, No. 1, January, pp. 615-625.

Vong, A, Hoi, S. (2009) *Determinants of Bank Profitability in Macao*. Faculty of Business Administration, University of Macau. **Box 2.3** Assumptions concerning disturbance terms and their interpreta

Annex

Annex 1 Descriptive Statistics

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ROA	29	2.1924	.4879	2.6803	1.540607	.1168331	.6291657	.396	.075	.434	-.912	.845
ROE	29	9.6250	.0636	9.6886	1.863697	.5361793	2.8874137	8.337	2.025	.434	2.955	.845
NIM	29	5.1800	.0200	5.2000	1.720000	.3035318	1.6345685	2.672	.826	.434	-.309	.845
GDPGR	29	16.1504	-3.0142	13.1362	6.359672	.9617168	5.1790036	26.822	-.492	.434	-1.203	.845
INF	29	56.8195	-11.8232	44.9963	9.677069	2.5842484	13.9166034	193.672	.849	.434	.682	.845
RIR	28	35.3200	-17.6700	17.6500	2.853571	1.8345092	9.7073104	94.232	-.514	.441	-.559	.858
EXR	29	17.0048	2.0700	19.0748	7.864417	.9280085	4.9974787	24.975	.780	.434	.117	.845
CR	29	.2700	.7300	1.0000	.904079	.0185911	.1001159	.010	-.416	.434	-1.457	.845
Valid N (listwise)	28											

Regression ROA as Dependent Variable

Annex 2 Regression (ROA as dependent Variable)

Descriptive Statistics

	Mean	Std. Deviation	N
ROA	1.511125E0	.6199763	28
GDPGR	6.218946E0	5.2172702	28
INF	9.758618E0	14.1649173	28
RIR	2.853571E0	9.7073104	28
EXR	7.464046E0	4.5911881	28
CR	.910296	.0960832	28

Annex 3 Model Summary (Dependent Variable ROA)

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.757 ^a	.573	.476	.4488792	.573	5.901	5	22	.001	2.019

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: ROA

Annex 4 Variables Entered ROA as Dependent Variable

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	CR, RIR, GDPGR, INF, EXR ^a		. Enter

a. All requested variables entered.

b. Dependent Variable: ROA

Annex 5 ANOVA (Dependent Variable ROA)

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.945	5	1.189	5.901	.001 ^a
	Residual	4.433	22	.201		
	Total	10.378	27			

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: ROA

Annex 6 Correlation Coefficient Dependent Variable ROA

Coefficient Correlations^a

Model			CR	RIR	GDPGR	INF	EXR
1	Correlations	CR	1.000	-.280	.227	-.115	.844
		RIR	-.280	1.000	.339	.719	-.533
		GDPGR	.227	.339	1.000	.238	-.059
		INF	-.115	.719	.238	1.000	-.408
		EXR	.844	-.533	-.059	-.408	1.000
	Covariances	CR	4.643	-.009	.010	-.002	.087
		RIR	-.009	.000	9.844E-5	9.756E-5	.000
		GDPGR	.010	9.844E-5	.000	4.497E-5	-5.706E-5
		INF	-.002	9.756E-5	4.497E-5	8.835E-5	.000
		EXR	.087	.000	-5.706E-5	.000	.002

a. Dependent Variable: ROA

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	GDPGR	INF	RIR	EXR	CR
1	1	3.960	1.000	.00	.01	.01	.00	.00	.00
	2	1.281	1.758	.00	.00	.06	.19	.00	.00
	3	.378	3.236	.00	.35	.29	.08	.00	.00
	4	.290	3.698	.00	.18	.02	.06	.03	.00
	5	.091	6.609	.00	.40	.61	.59	.23	.00
	6	.001	71.108	1.00	.06	.01	.08	.73	1.00

a. Dependent Variable: ROA

Annex 7 Case wise Diagnostics Dependent variable ROA

Casewise Diagnostics ^b					
Case Number	Std. Residual	ROA	Predicted Value	Residual	Status
1	0.217	1.39	1.292514	0.0974859	
2	-0.69	1.07	1.379916	-3.10E-01	
3	0.614	1.11	0.834405	0.2755947	
4	0.468	1.09	0.879839	0.2101613	
5	-0.077	0.96	0.994504	-3.45E-02	
6	1.121	1.2676	0.764337	0.5032628	
7	-0.199	0.4879	0.577088	-8.92E-02	
8	0.125	1.4956	1.439591	0.0560093	
9	-0.816	0.8008	1.167125	-3.66E-01	
10	1.467	1.9506	1.292106	0.6584942	
11	0.221	1.5677	1.468531	0.0991691	
12	2.043	2.2827	1.365416	0.9172838	
13	-1.556	0.54	1.238553	-6.99E-01	
14	-1.488	0.7922	1.46013	-6.68E-01	
15	-0.017	1.3634	1.370853	-7.45E-03	
16	-0.396	1.5067	1.684363	-1.78E-01	
17	0.536	1.7265	1.485715	0.2407851	
18	-1.701	0.5691	1.332789	-7.64E-01	
19	-1.339	1.2456	1.846623	-6.01E-01	
20	-0.011	1.9521	1.957219	-5.12E-03	
21	0.201	2.0085	1.918104	0.0903965	
22	0.335	2.1089	1.958696	0.1502045	
23	-0.026	1.9309	1.942767	-1.19E-02	
24	0.254	2.1071	1.993164	0.1139365	
25	-1.061	1.3595	1.835797	-4.76E-01	
26	0.146	2.2957	2.230207	0.0654931	
27	0.987	2.6803	2.237178	0.4431218	
28	0.642	2.6521	2.363973	0.2881274	
29	.	2.3661	.	.	M ^a
a. Missing Case					
b. Dependent Variable: ROA					

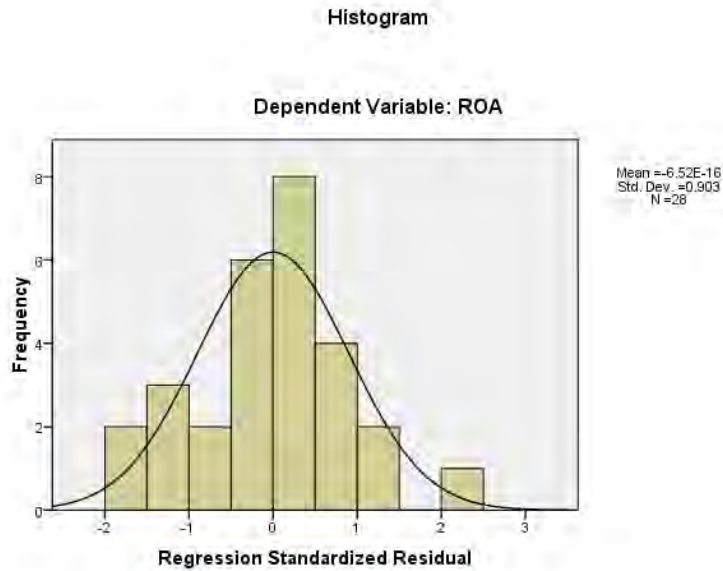
Annex 8 Residual Statistics Dependent Variable ROA

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.577088	2.363973	1.511125E0	.4692457	28
Residual	-7.6368880E-1	.9172838	2.8945100E-16	.4051902	28
Std. Predicted Value	-1.991	1.817	.000	1.000	28
Std. Residual	-1.701	2.043	.000	.903	28

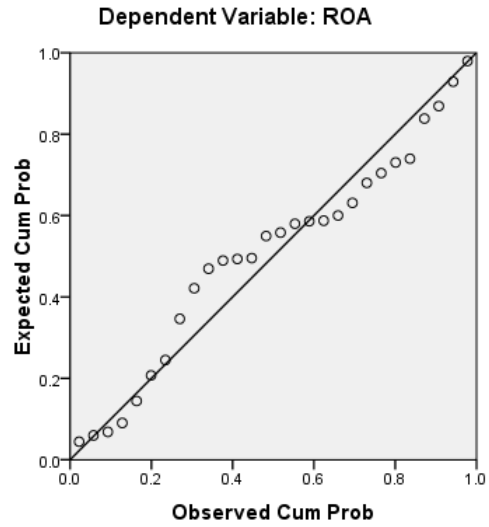
a. Dependent Variable: ROA

Annex 9 Histogram Dependent Variable ROA



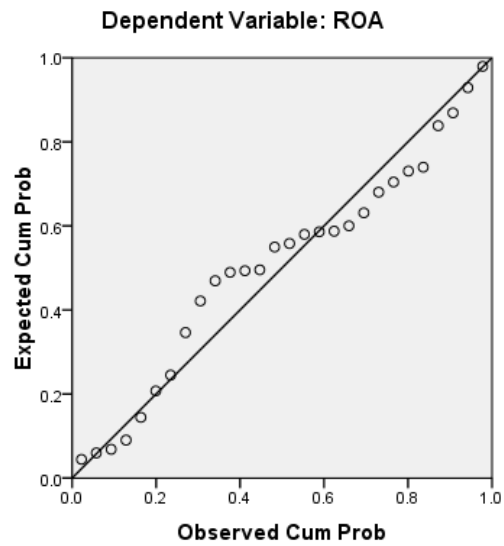
Annex 10 Normal PP Plot Dependent Variable ROA

Normal P-P Plot of Regression Standardized Residual

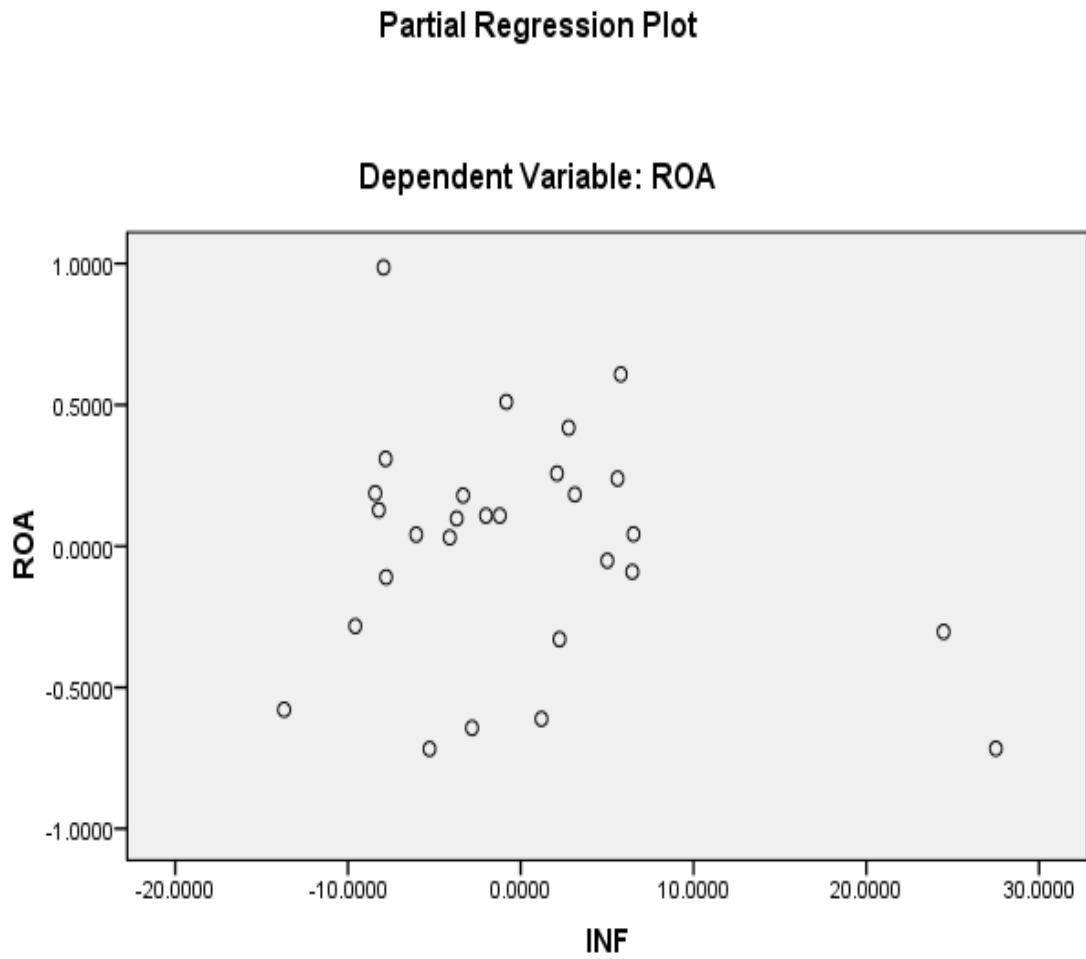


Annex 11 Normal P-P Plot Standard Residual (dependent variable ROA)

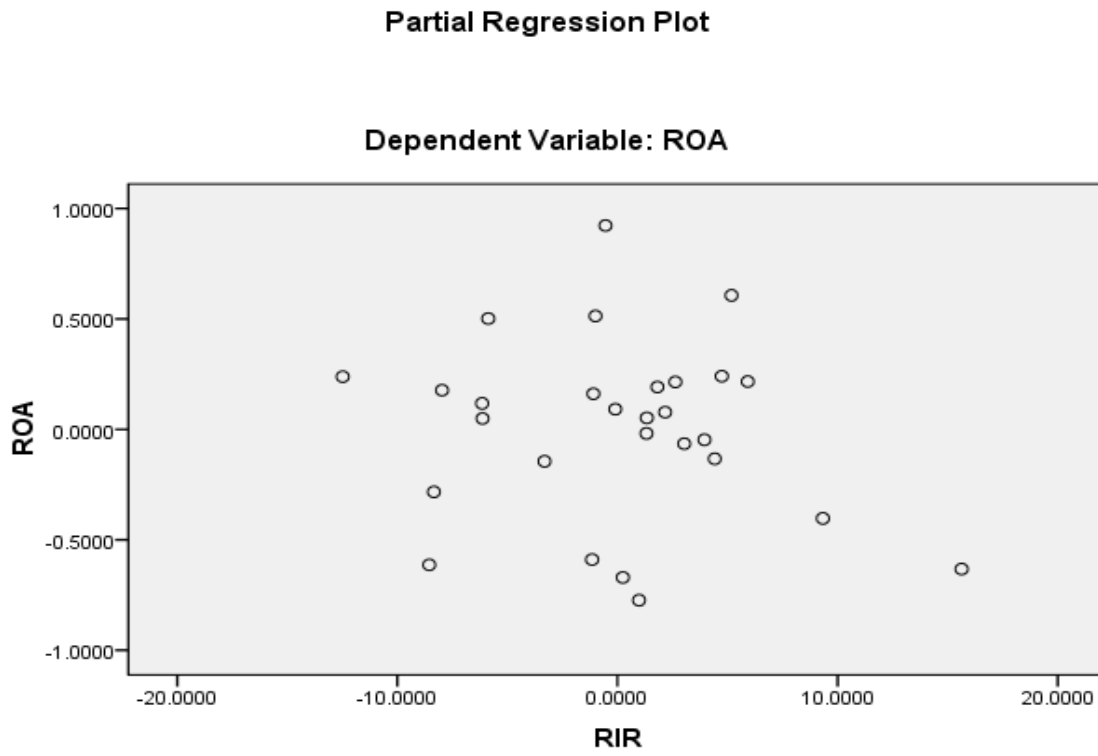
Normal P-P Plot of Regression Standardized Residual



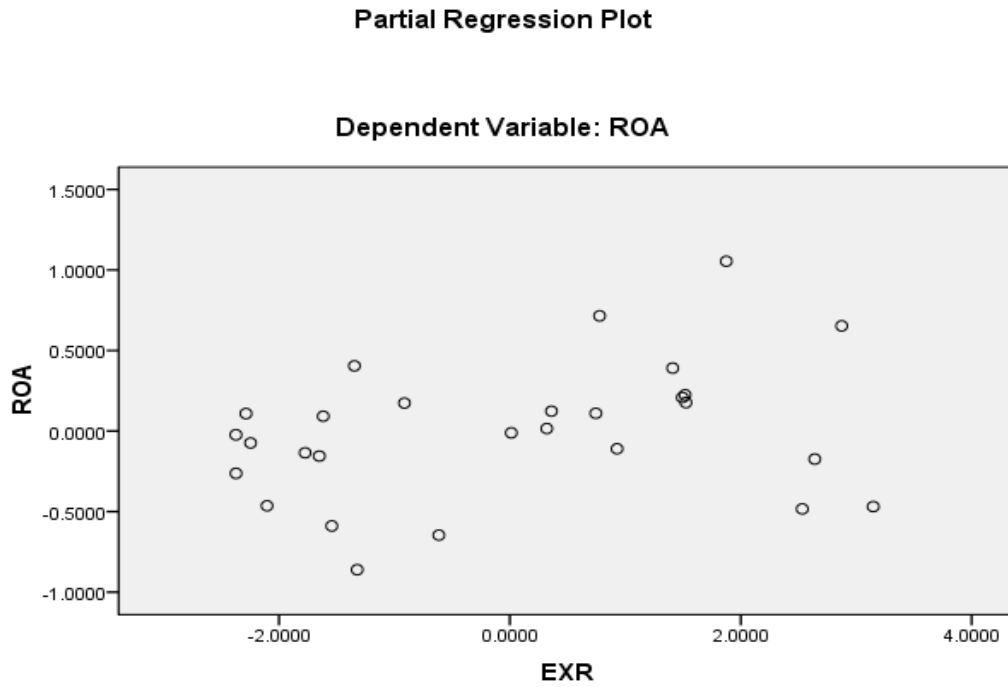
Annex 12 Partial Regression Plot Dependent Variable ROA



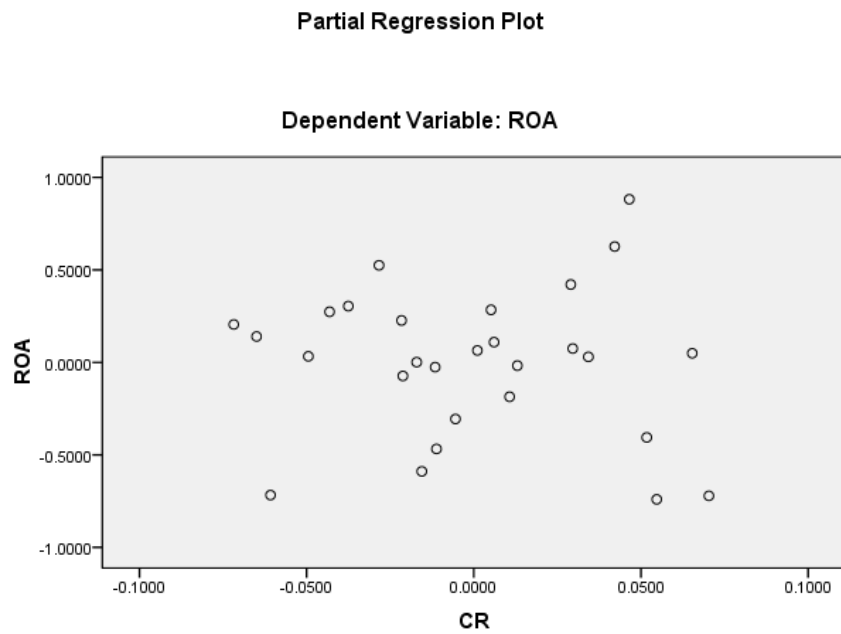
Annex 13 Partial Regression Plot Dependent variable ROA



Annex 14 Partial Regression Plot ROA vs EXR



Annex 15 Partial Regression Plot ROA vs CR



Regression ROE as Dependent Variable

Annex 16 Correlations Dependent Variable ROE

Correlations

		ROE	GDPGR	INF	RIR	EXR	CR
Pearson Correlation	ROE	1.000	.073	-.079	.044	.118	.075
	GDPGR	.073	1.000	.169	-.270	.349	-.467
	INF	-.079	.169	1.000	-.594	.333	-.357
	RIR	.044	-.270	-.594	1.000	.156	.038
	EXR	.118	.349	.333	.156	1.000	-.883
	CR	.075	-.467	-.357	.038	-.883	1.000
Sig. (1-tailed)	ROE	.	.355	.345	.412	.275	.352
	GDPGR	.355	.	.195	.082	.034	.006
	INF	.345	.195	.	.000	.042	.031
	RIR	.412	.082	.000	.	.214	.425
	EXR	.275	.034	.042	.214	.	.000
	CR	.352	.006	.031	.425	.000	.
N	ROE	28	28	28	28	28	28
	GDPGR	28	28	28	28	28	28
	INF	28	28	28	28	28	28
	RIR	28	28	28	28	28	28
	EXR	28	28	28	28	28	28
	CR	28	28	28	28	28	28

Annex 17 Descriptive Statistics Dependent Variable ROE

Descriptive Statistics

	Mean	Std. Deviation	N
ROE	1.828829E0	2.9341742	28
GDPGR	6.218946E0	5.2172702	28
INF	9.758618E0	14.1649173	28
RIR	2.853571E0	9.7073104	28
EXR	7.464046E0	4.5911881	28
CR	.910296	.0960832	28

Annex 18 Variables Entered Dependent Variable ROE

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	CR, RIR, GDPGR, INF, EXR ^a		. Enter

a. All requested variables entered.

b. Dependent Variable: ROE

Annex 19 Model Summary Dependent Variable ROE

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.486 ^a	.236	.063	2.8407799	.236	1.361	5	22	.277	1.611

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: ROE

Annex 20 ANOVA Dependent Variable ROE

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.913	5	10.983	1.361	.277 ^a
	Residual	177.541	22	8.070		
	Total	232.453	27			

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: ROE

Annex 21 Coefficients Dependent Variable ROE

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-33.071	14.409		-2.295	.032					
	GDPGR	.074	.127	.131	.578	.569	.073	.122	.108	.676	1.479
	INF	-.061	.059	-.296	-1.029	.315	-.079	-.214	-.192	.421	2.375
	RIR	-.096	.091	-.318	-1.051	.305	.044	-.219	-.196	.380	2.634
	EXR	.744	.303	1.165	2.455	.022	.118	.464	.457	.154	6.485
	CR	32.690	13.637	1.070	2.397	.025	.075	.455	.447	.174	5.744

a. Dependent Variable:

ROE

Annex 22 Coefficient Correlations ROE

Coefficient Correlations^a

Model		CR	RIR	GDPGR	INF	EXR	
1	Correlations	CR	1.000	-.280	.227	-.115	.844
		RIR	-.280	1.000	.339	.719	-.533
		GDPGR	.227	.339	1.000	.238	-.059
		INF	-.115	.719	.238	1.000	-.408
		EXR	.844	-.533	-.059	-.408	1.000
	Covariances	CR	185.959	-.349	.395	-.093	3.489
		RIR	-.349	.008	.004	.004	-.015
		GDPGR	.395	.004	.016	.002	-.002
		INF	-.093	.004	.002	.004	-.007
		EXR	3.489	-.015	-.002	-.007	.092

a. Dependent Variable: ROE

Annex 23 Case wise Diagnostics ROE

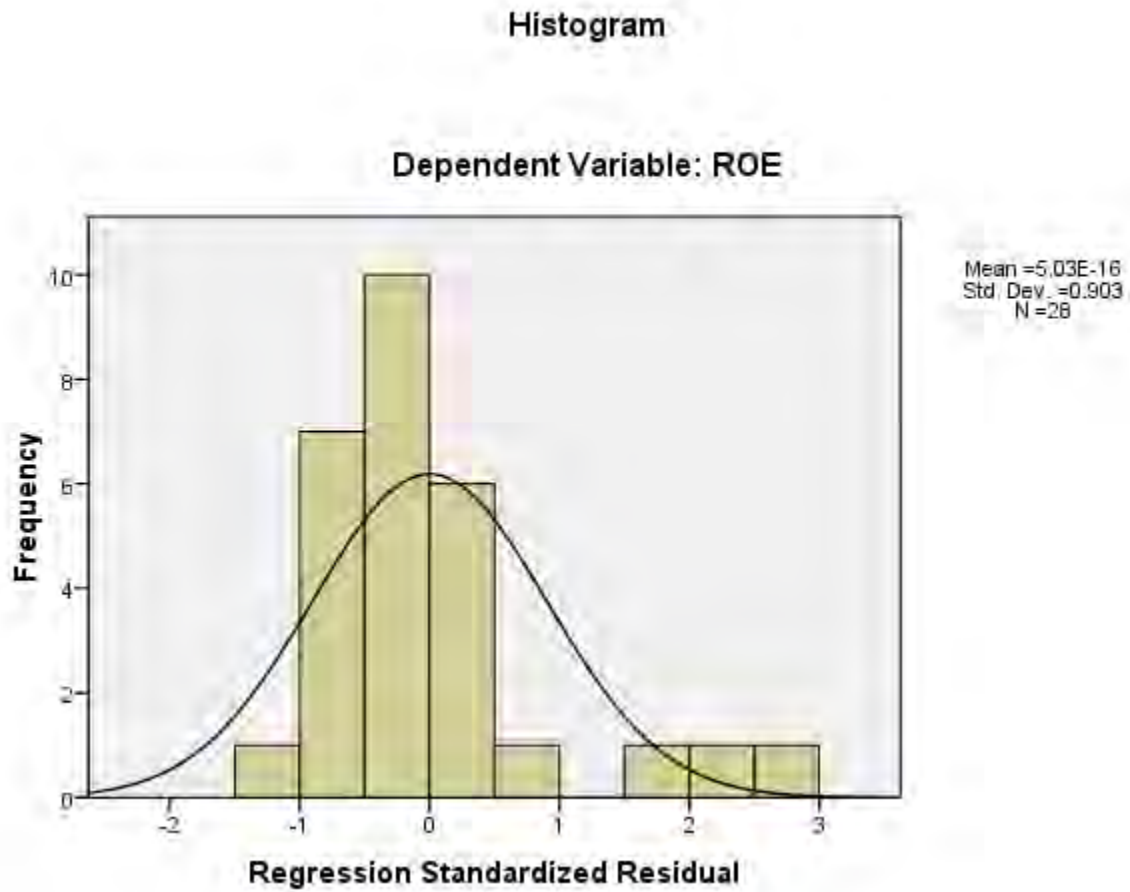
Casewise Diagnostics ^b					
Case Number	Std. Residual	ROE	Predicted Value	Residual	Status
1	-0.748	0.211	2.335162	-2.12E+00	
2	-0.441	0.3278	1.581173	-1.25E+00	
3	0.021	0.226	0.165537	0.0604634	
4	-0.044	0.398	0.523108	-1.25E-01	
5	-0.142	0.358	0.762778	-4.05E-01	
6	-0.006	0.36	0.37721	-1.72E-02	
7	0.295	0.13	0.708696	0.8386961	
8	-0.813	0.72	3.029707	-2.31E+00	
9	-1.084	0.5	3.578964	-3.08E+00	
10	-0.773	0.72	2.915945	-2.20E+00	
11	2.133	9.6886	3.628907	6.06E+00	
12	1.856	8.956	3.682224	5.27E+00	
13	0.748	6.0936	3.96923	2.12E+00	
14	-0.781	2.0667	4.28553	-2.22E+00	
15	-0.234	1.3968	2.061195	-6.64E-01	
16	-0.548	1.0628	2.619003	-1.56E+00	
17	-0.092	0.689	0.94957	-2.61E-01	
18	0.154	0.5406	0.102936	0.4376641	
19	-0.374	0.348	1.411348	-1.06E+00	
20	-0.169	0.2399	0.720777	-4.81E-01	
21	0.143	0.4389	0.032181	0.4067189	
22	0.139	0.2661	0.127672	0.3937722	
23	2.714	9.3805	1.670983	7.71E+00	
24	-0.786	0.1931	2.424586	-2.23E+00	
25	-0.23	0.1122	0.7667	-6.54E-01	
26	-0.942	0.0636	2.73985	-2.68E+00	
27	-0.095	2.84	3.111194	-2.71E-01	
28	0.099	2.88	2.597769	0.2822312	
29	.	2.84	.	.	M ^a
a. Missing Case					
b. Dependent Variable: ROE					

Annex 24 Residual Statistics ROE

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.708696	4.285530	1.828829E 0	1.4261127	28
Residual	3.0789642E 0	7.7095165E 0	.0000000	2.5642895	28
Std. Predicted Value	-1.779	1.723	.000	1.000	28
Std. Residual	-1.084	2.714	.000	.903	28

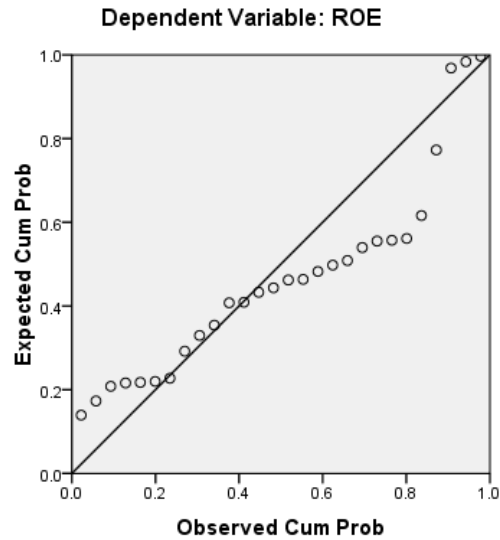
a. Dependent Variable: ROE

Annex 25 Histogram ROE



Annex 26 Normal P-P Plot ROE

Normal P-P Plot of Regression Standardized Residual



Regression NIM as Dependent Variable

Annex 27 Descriptive Statistics NIM

Descriptive Statistics

	Mean	Std. Deviation	N
NIM	1.680000E0	1.6500460	28
GDPGR	6.218946E0	5.2172702	28
INF	9.758618E0	14.1649173	28
RIR	2.853571E0	9.7073104	28
EXR	7.464046E0	4.5911881	28
CR	.910296	.0960832	28

Annex 28 Pearson Correlation

		Correlations					
		NIM	GDPGR	INF	RIR	EXR	CR
Pearson Correlation	NIM	1.000	.063	.368	-.178	.279	-.161
	GDPGR	.063	1.000	.169	-.270	.349	-.467
	INF	.368	.169	1.000	-.594	.333	-.357
	RIR	-.178	-.270	-.594	1.000	.156	.038
	EXR	.279	.349	.333	.156	1.000	-.883
	CR	-.161	-.467	-.357	.038	-.883	1.000
Sig. (1-tailed)	NIM	.	.375	.027	.182	.075	.206
	GDPGR	.375	.	.195	.082	.034	.006
	INF	.027	.195	.	.000	.042	.031
	RIR	.182	.082	.000	.	.214	.425
	EXR	.075	.034	.042	.214	.	.000
	CR	.206	.006	.031	.425	.000	.
N	NIM	28	28	28	28	28	28
	GDPGR	28	28	28	28	28	28
	INF	28	28	28	28	28	28
	RIR	28	28	28	28	28	28
	EXR	28	28	28	28	28	28
	CR	28	28	28	28	28	28

Annex 29 Variable Entered NIM

Variables Entered/Removed ^b			
Model	Variables Entered	Variables Removed	Method
1	CR, RIR, GDPGR, INF, EXR ^a		. Enter

a. All requested variables entered.

b. Dependent Variable: NIM

Annex 30 Model Summary NIM

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.480 ^a	.230	.055	1.6037968	.230	1.316	5	22	.294	1.513

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: NIM

Annex 31 ANOVA NIM

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.924	5	3.385	1.316	.294 ^a
	Residual	56.588	22	2.572		
	Total	73.512	27			

a. Predictors: (Constant), CR, RIR, GDPGR, INF, EXR

b. Dependent Variable: NIM

Annex 32 Coefficients NIM

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-9.724	8.135		-1.195	.245					
	GDPGR	-.006	.072	-.020	-.087	.932	.063	-.019	-.016	.676	1.479
	INF	.024	.034	.204	.706	.487	.368	.149	.132	.421	2.375
	RIR	-.035	.052	-.205	-.675	.507	-.178	-.142	-.126	.380	2.634
	EXR	.277	.171	.772	1.620	.119	.279	.327	.303	.154	6.485
	CR	10.151	7.699	.591	1.319	.201	-.161	.271	.247	.174	5.744

a. Dependent Variable: NIM

Annex 33 Coefficient Correlations NIM

Coefficient Correlations^a

Model			CR	RIR	GDPGR	INF	EXR
1	Correlations	CR	1.000	-.280	.227	-.115	.844
		RIR	-.280	1.000	.339	.719	-.533
		GDPGR	.227	.339	1.000	.238	-.059
		INF	-.115	.719	.238	1.000	-.408
		EXR	.844	-.533	-.059	-.408	1.000
	Covariances	CR	59.271	-.111	.126	-.030	1.112
		RIR	-.111	.003	.001	.001	-.005
		GDPGR	.126	.001	.005	.001	.000
		INF	-.030	.001	.001	.001	-.002
		EXR	1.112	-.005	.000	-.002	.029

a. Dependent Variable: NIM

Annex 34 Co linearity Diagnostics

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	GDPGR	INF	RIR	EXR	CR
1	1	3.960	1.000	.00	.01	.01	.00	.00	.00
	2	1.281	1.758	.00	.00	.06	.19	.00	.00
	3	.378	3.236	.00	.35	.29	.08	.00	.00
	4	.290	3.698	.00	.18	.02	.06	.03	.00
	5	.091	6.609	.00	.40	.61	.59	.23	.00
	6	.001	71.108	1.00	.06	.01	.08	.73	1.00

a. Dependent Variable: NIM

Annex 35 Case wise Diagnostics NIM

Casewise Diagnostics^b

Case Number	Std. Residual	NIM	Predicted Value	Residual	Status
1	.038	2.1000	2.039477	.0605226	
2	.986	1.7600	.178533	1.5814668E0	
3	.689	1.5500	.444486	1.1055140E0	
4	.392	1.6900	1.061704	.6282964	
5	.223	1.5800	1.222742	.3572581	
6	.139	1.2700	1.046762	.2232379	
7	-.826	1.1400	2.465119	-1.3251187E0	
8	-.262	.9900	1.410788	-4.2078794E-1	
9	-.013	2.1000	2.120995	-2.0995120E-2	
10	.881	3.2000	1.787102	1.4128979E0	
11	-1.212	.3500	2.293067	-1.9430672E0	
12	-.638	.3900	1.413635	-1.0236355E0	
13	1.972	5.1400	1.977180	3.1628198E0	
14	-1.178	.1000	1.989409	-1.8894093E0	
15	-1.096	.1000	1.857241	-1.7572413E0	

16		-.929	.1000	1.589882	-1.4898820E0
17		-.343	.0900	.639418	-5.4941781E-1
18		-.561	.0200	.919557	-8.9955740E-1
19		-1.057	.1300	1.825374	-1.6953739E0
20		-.460	.1500	.887944	-7.3794386E-1
21		-.563	.1900	1.092858	-9.0285754E-1
22		-.512	.2300	1.051382	-8.2138155E-1
23		1.589	4.4000	1.852360	2.5476396E0
24		1.276	4.7000	2.653792	2.0462084E0
25		1.634	5.2000	2.579407	2.6205929E0
26		.310	2.6500	2.152917	.4970830
27		-.566	2.8400	3.747220	-9.0721986E-1
28		.088	2.8800	2.739648	.1403516
29		.	2.8400	.	.M ^a

a. Missing Case

b. Dependent Variable: NIM

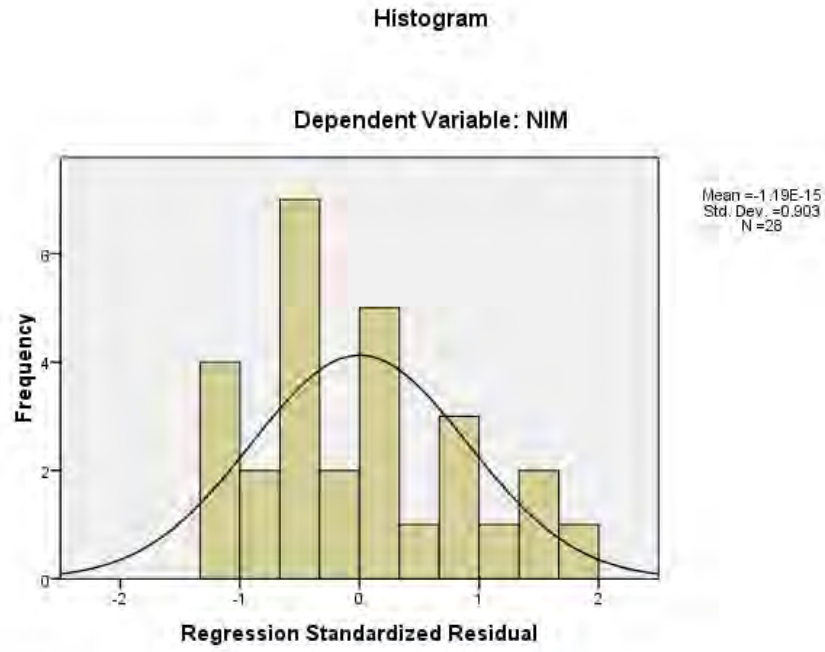
Annex 36 Residual Statistics NIM

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.178533	3.747220	1.680000E 0	.7917162	28
Residual	- 1.9430672E 0	3.1628199E 0	- 1.9359514 E-15	1.4477007	28
Std. Predicted Value	-1.896	2.611	.000	1.000	28
Std. Residual	-1.212	1.972	.000	.903	28

a. Dependent Variable: NIM

Annex 37 Histogram NIM



Annex 38 P-P Plot standardized Residual NIM

Normal P-P Plot of Regression Standardized Residual

