Analyzing Financial Performance of Commercial Banks in Ethiopia: CAMEL Approach

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This is to certify that the thesis prepared by Mulualem Getahun, entitled: Analyzing Financial Performance of Commercial Banks in Ethiopia: CAMELS Approach and Submitted in partial fulfillment of the requirements for the degree of Degree of Master of Science (Accounting and Finance) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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ABSTRACT

The objective of this study was to analyze the financial performance of Ethiopian Commercial Banks using CAMEL approach and rank the banks based on their performance as well as to test the existence of the relationship between the selected CAMEL factor measurements with the profitability measures. The financial performance of Fourteen Commercial Banks examined by using panel data from year 2010 to year 2014.The study used quantitative research approach and secondary financial data are analyzed by using multiple linear regression model for two profitability measures: ROE and ROA. Fixed effect regression model was applied to investigate the impact & relationship of CAMEL factors: Capital adequacy, Asset Quality, Management efficiency, Earning and Liquidity with bank profitability measures separately. The empirical result shows that capital adequacy, Asset Quality and Management efficiency have negative relation whereas earning and liquidity shows positive relationship with both profitability measures with strong statically significance except Capital Adequacy which is insignificant for ROA whereas Asset quality for ROE. The study suggests focusing and reengineering the banks internal drivers could enhance the profitability of commercial banks in Ethiopia. Furthermore the ranking result based showed the first one by capital adequacy, asset quality and liquidity ratio was Bunna International Bank while Commercial Bank of Ethiopia by Management efficiency and Earning ratio and finally Wogagen Bank was the first by the composite rate.

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List of acronyms

AIB	Awash International Bank
AQ	Asset Quality
BIB	Berhan International Bank
BJ	Bera-Jarque
BOA	Bank of Abyssinia
BUIB	Bunna International Bank
CA	Capital Adequacy
CAMEL	Capital adequacy, Asset Quality, Management quality, Earning quality, Liquidity
CBB	Construction and Business Bank
CBE	Commercial Bank of Ethiopia
CBO	Corporate Bank of Oromiya
CLRM	Classical Linear Regression Model
DB	Dashen Bank
DW	Durbin-Watson
EAR	Earning Ability
LIB	Lion International Bank
LIQ	Liquidity
MGT	Management Quality
NBE	National Bank of Ethiopia
NIB	Nib International Bank
OIB	Oromiya International Bank
ROA	Return of Asset
ROE	Return on Equity
UB	United Bank
WB	Wogagen Bank
ZB	Zemen Bank

CHAPTER ONE

1 INTRODUCTION

1.1 Back Ground of the Study

Financial sector of an economy plays an important role in its economic development and prosperity of the country. Banking industry serves as the backbone of the financial sector that accumulates saving from surplus economic units in the form of deposits and provides it to deficit economic units in the form of advances. Banking industry provides support to the economy in general and industries in particular in the time of recessions and economic crisis. But when banks are at the heart of economic recession or banks are the cause of financial crisis like the recent past financial crisis 2007-09, it makes the situation worst for economic recovery. So it is of great importance to keenly observe the performance of the banks and their compliance with the regulatory requirements.

Performance of banks is measured at two levels, one is at the management and regulatory level of the banks and another is at external rating agencies. Purpose of regulatory and supervisory rating systems is to measure the bank performance at internal level and its compliance with regulatory requirements to keep the bank on right track. These ratings are highly confidential and are only available to the bank management. External credit rating agencies examine and evaluate banks and issue ratings for the general public and investors in particulars. It is of great importance that both these ratings present the same results about the condition of the banks to provide clear information to investors and management. In the past several banks suffer from bankruptcy that suggests the failure of both internal rating systems and credit rating agencies.

The banking environment in Ethiopia has, for the two decades, undergone many regulatory and financial reforms like other African countries and the rest of developing world. These reforms have brought about many structural changes in the banking sector of the country and have also encouraged private banks to enter and expand their operations in the industry (Lelissa 2007). Despite these changes, currently, the banking industry in Ethiopia is characterized by operational inefficiency, little and insufficient competition and perhaps can be distinguished by its market concentration towards the

big government owned commercial bank and having undiversified ownership structure (Lelisa 2007). The existence of less efficiency and little & insufficient competition in the country's banking industry is a clear indicator of relatively poor performance of the sector compared to the developed world financial institutions. Thus, it is important to evaluate the banks performance critically for an efficient management of banking operations as well as to ensure financial soundness of the banking industry.

In light of the above, the purpose of this paper is to evaluate the performance of Commercial Banks using CAMELS model. This model is the supervisory and regulatory rating system. It takes into account six important components of a bank when it evaluates performance of the bank. These components are Capital, Assets, Management, Earning, Liquidity and Sensitivity to market risk. Ratings is assigned to theses components on the scale of 1 to 5 and that is a base for composite rating that also ranged from 1 to 5.

1.2 Overview of the Ethiopian banking System

Modern banking in Ethiopia started in 1905 with the establishment of Abyssinian Bank which was based on a fifty year agreement with the Anglo-Egyptian National Bank. In 1908 Socite Nationale d'Ethiope pour le Development Dei' Agricalture et du and two other foreign banks (i.e Banque de l'Indochine and the Compagnie del' Afrique Orientale) were also established (Degefe 1995 cited in Geda 2006). As noted in Geda (2006) these banks were criticized for being wholly foreign owned. In 1931 the Ethiopian government purchased the Abyssinian Bank, which was the dominant bank, and renamed it the Bank of Ethiopia. i.e., the first nationally owned bank on the African continent (Gedey 1990, pp. 83, cited in Geda 2006).

During the five-years of Italian occupation i.e during the period 1936-41 banking activity of the country was relatively expanded. In that time, the Italian banks were particularly active. As a result, most of the banks that were in operation during this period were Italian banks. After independence from Italy's brief occupation, where the role of Britain was paramount owing to its strategic planning during the Second World War, Barclays Bank was established and it remained in business in Ethiopia between

1941 and 1943 (Degefe 1995 cited in Geda 2006). Following this, in 1943 the Ethiopian government established the State Bank of Ethiopia. As noted in Degefe (1995 cited in Geda 2006) the establishment of the Bank by Ethiopia was a painful process because Britain was against it. The Bank of Ethiopia was operating as both a commercial and a central bank until 1963 when it was remodeled into today's National Bank of Ethiopia (NBE) (the Central Bank, re-established in 1976) and the Commercial Bank of Ethiopia (CBE). After this period many other banks were established; and just before the 1974 revolution those banks were in operation (Degefe 1995 cited in Geda 2006).

As stated in (Degefe 1995 cited in Geda 2006), all privately owned financial institutions including three commercial banks, thirteen insurance companies, and two non-bank financial intermediaries were nationalized on 1 January 1975. The nationalized banks were reorganized and one commercial bank (the CBE), a national bank (recreated in 1976), two specialized banks i.e., the Agricultural and Industrial Bank, renamed recently as the Development Bank of Ethiopia and a Housing and Saving Bank, renamed recently as the CBB, and one insurance company (Ethiopian Insurance Company) were formed.

Following the regime change in 1991 and the liberalization policy in 1992, these financial institutions were reorganized to work to a market-oriented policy framework. Moreover, new privately owned financial institutions were also allowed to work alongside the publicly owned ones. As a result, currently, the country has two public-owned and eighteen private commercial banks, which are operating throughout the country. (See Annex 1 list of Commercial bank operating in Ethiopia)

1.3 Statement of the Problem

The Economic downturn of 2008 which is resulted in bank failures, are triggered in the U.S. and then wildly spread worldwide. It therefore increasingly urges the need of more frequent banking examination. This economic crisis has also highlighted that a well-functioning financial system is significantly important for economic growth. The financial system enables an economy to be more productive as it allows investors with few resources to use savings from those with few prospects of investing. In this context, it is crucial to know how Ethiopian banking performing.

The study, therefore, aims to analyze and evaluate Ethiopian Commercial Banks performance based on the CAMEL framework, which is used to evaluate the overall safety and soundness of a bank.

1.4 Objectives of the Study

The objective of this study is to measure the best performance among the commercial banks and to find out the relationship between bank specific factors (Ratios) on the banks' performance using CAMEL model. Based on the objectives, the present study seeks to test the following hypothesis:

H1: There is a significant relationship between capital adequacy ratios and Performance of the banks.

H2: There is a significant relationship between asset quality ratios and performance of the banks.

H3: There is a significant relationship between management efficiency ratios and performance of the banks.

H4: There is a significant relationship between earnings ratios and performance of the banks

H5: There is a significant relationship between liquidity ratios and performance of the banks.

1.5 Methodology Applied

CAMEL is a ratio-based model used to evaluate the performance of banks with the help of different criteria, viz. Capital Adequacy, Asset Quality, Management Quality, Earnings and Liquidity. The present study is a descriptive research study based on analytical research design.

The study can be considered as a desk research as it has made an in-depth search on existing literature and recent and relevant researches published domestic and international journals. The study has relied basically on secondary information which includes: text books, Journal research articles, Audited and unaudited financial reports and electronic library resources.

1.6 Scope and Limitation of the study

The scope of the study is limited to commercial banks established in Ethiopia. The Study has taken in to account the performance of the banks for the period ranging from 2010 to 2014.As a result, it includes the two government owned banks namely CBE and CBB and twelve private owned commercial banks namely, DB, AIB, BOA, WB, UB, NIB, LIB, CBO, ZB, OIB, BUIB and BIB.

Due to the confidentiality of banking industry information the researcher found it fairly tough to access certain type of materials, like off balance sheet items and Non-performing loans data, which would limit the research work. In addition, the unavailability of data related to the measurement of the Sixth factor of the CAMEL model, i.e. Sensitivity to the market, the researcher couldn't include in this study.

1.7 Significance of the Study

Banks serve as backbone to the financial sector, which facilitate the proper utilization of financial resources of a country. The banking sector is increasingly growing and it has witnessed a huge flow of investment. In addition to simply being involved in the financial intermediation activities, banks are operating in a rapidly innovating industry that urges them to create more specialized financial services to better satisfy the changing needs of their customers. Sundararajan et al. **(**2002) argues that the financial system, the bank in particular, is exposed to a variety of risks that are growing more complex nowadays. Furthermore, the economic downturn of 2008 which resulted in bank failures, are triggered in the U.S. and then wildly spread worldwide. It therefore increasingly urges the need of more frequent banking examination.

In order to cope with the complexity and a mix of risk exposure to banking system properly, responsibly, beneficially and sustainably, it is of great importance to evaluate the overall performance of banks by implementing a regulatory banking supervision framework. One of such measures of supervisory information is the CAMEL rating system.

Therefore, the current study is significant; for it assesses determinants of bank performance based on the CAMEL model and for it gives important insight to supervisors as well as managers of Commercial banks in Ethiopia. It also shades light about the importance of CAMEL Model to risk managers and others who are interested to examine the performance of the banks.

The study is also hoped to provide useful information for stakeholders to make better investment decisions and to help banks to mark and re-evaluate their performance based on the performance measurement used in the study.

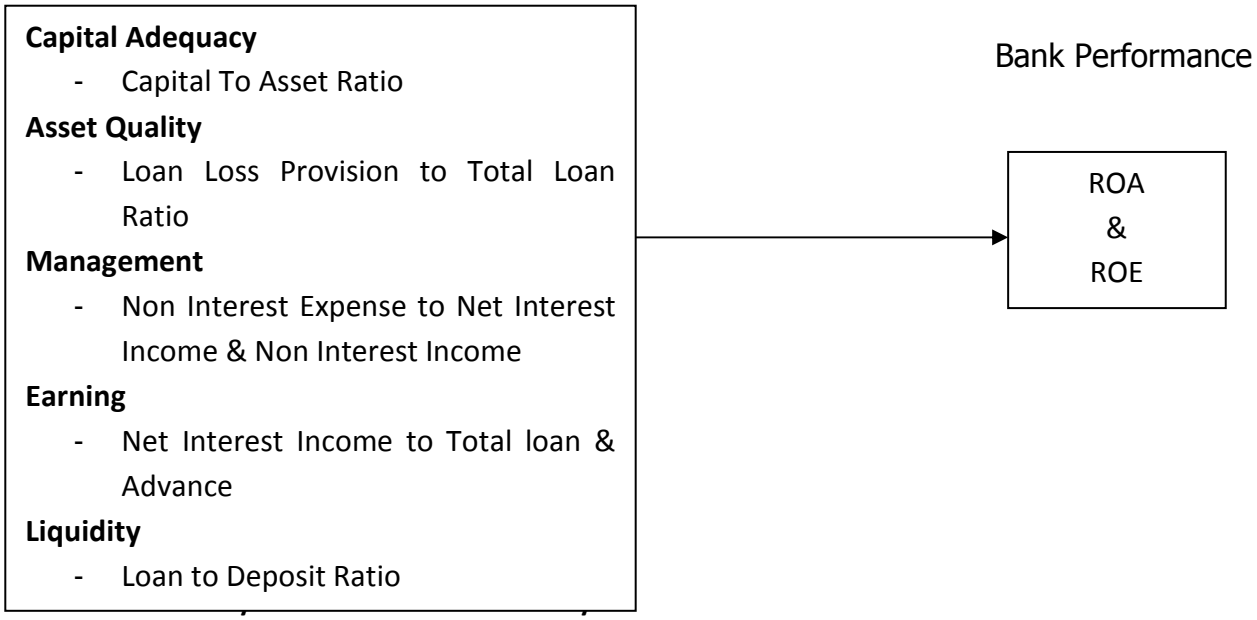
Finally, the study helps other researchers as a source of reference and as a stepping stone for those who want to make further study on the area afterwards. Beside this, it gives the opportunity to all stake holders to gain knowledge about the CAMEL Model.

1.8 Conceptual Framework

Based on the insights gained from review of the literature, the following conceptual framework showing the relationship between independent variables and dependent variable was created. Five research hypotheses were developed to investigate the relationship among the variables included in the conceptual framework. These hypotheses test if there is a significant positive relationship between the capital adequacy ratio, assets quality ratio, management ratio, earning ratio and liquidity ratio with bank performance.

Figure 1 Conceptual Framework CAMEL Model

C A M E L Model Factors



1.9 Organization of the Study

This study is organized into five chapters. Chapter one presents introductions of the study. The literature review part of the study is presented in chapter two. The literature review includes the theoretical review in its first section which is followed by the review of previous studies. Chapter three presents the research design and methodology and result and discussion are presented in chapter four. Finally, Chapter five presents summary, Conclusion and recommendation of the study.

Chapter Two

2. Literature Review

2.1 Why Are Financial Soundness Indicators (FSIs) Data Needed?

The recognition of the need for FSI statistics among the international community arose out of the financial crises of the 1990s. A review of recent decades shows that many IMF member countries experienced financial crises that often resulted in severe disruptions of economic activity. The significant costs of these crises, both direct (such as the cost of recapitalizing the deposit takers) and indirect (such as the loss of real economic activity), have highlighted the need to develop a body of—preferably high frequency—statistics that could help policymakers in macro prudential analysis, that is, in identifying the strengths and vulnerabilities in their countries' financial systems. Such analysis could form the basis for taking action to prevent crises from occurring. Understanding of the nature and causes of financial system crises has developed a great deal in recent years, but analytical work continues. Financial system crises can arise from the failure of one or more institutions, whose effects then spread through a variety of contagion mechanisms to affect the whole system. The original shock that caused the failure is likely to be external or *exogenous* to the institution. Indeed, prudential supervision supports efforts to identify potential vulnerabilities in individual institutions before they become severe, and if they do become serious to inform actions that limit their systemic consequences Systemic crises can also arise from the exposure of a financial system to common risk factors. Under these circumstances, systemic stability is determined by behavior internal or *endogenous* to the system. In other words, financial crises arise when the collective actions of individual agents make the system itself vulnerable to shocks. The buildup of these vulnerabilities and risks tends to occur over time, such as during an economic upswing when confidence is high, before materializing in recessions. The sources of vulnerability of the financial system can vary: for example, poor asset quality, undue exposures to market and credit risk, and lack of capital. The timing of a crisis and its immediate causes can also vary: for example, the deteriorating condition of private borrowers, excess government

borrowing that undermines confidence, concern over a large current account deficit, and/or a sharp swing in the exchange rate. When the financial system is vulnerable, such events can result in a financial system crisis that imposes severe losses on an economy, both directly and indirectly: directly as depositors lose funds as banks fail and as governments incur fiscal costs to rebuild the financial system; indirectly as economic activity is reduced by the disruption of financial intermediation and/or payment systems. Moreover, there can be adverse social consequences from the economic and financial disruptions.

FSIs is used to (1) assess the vulnerability of the financial sector to shocks; (2) assess the condition of nonfinancial sectors; (3) monitor financial sector vulnerabilities arising from credit, liquidity, and market risk; and (4) assess the capacity of the financial sector to absorb losses, as measured by capital adequacy.

2.2 Why Performance measurement of banking sector?

Banking sector is an important and unquestionable determinant of the economic development as it directs the flow of the funds from surplus economic units of the economy towards deficit economic units (Khan, 2006, p. 11). Banking industry being an important pillar of financial sector of an economy, its performance measurement cannot be neglected. Role of financial institutions and banks in particular in economic development of a country is accepted and acknowledged by Joseph Schumpeter way back in 1911. He argued that functions performed by financial institutions such as mobilizing savings of the surplus units of an economy, risk measuring and management activities, complicated transactions being performed by these institutions and evaluation of the business projects all together increase the pace of economic growth (King & Levine, 1993, p. 717). Hicks also argued in his theory of economic development that financial institutions play an important role in the growth of an economy (Samules, 1993). Goldsmith also argued that size of a financial system plays a pivotal role in economic development and proved it trough his research on a sample of 35 different countries that they show positive correlation among each other. Besides those researchers who are in favor of the positive correlation between financial sector of an economy and its economic development, there are few researchers who contradict and

oppose them. This contradiction is mostly from the researchers who work in the field of development economics and include 3 noble prize winners. These researchers are "Bauer, Colin, Clark, Hirschman, Lewis, Myrdal, Prebisch, Rosenstein-Rodan, Rostow, Singer and Tinbergen" (Burzynska, 2009, p. 9).

2.3 Fundamentals of the CAMEL rating system

In the 1980`s CAMEL rating system was first introduced by U.S. supervisors authorities as a system of rating for onsite examinations of banking institutions. Under this system, each banking initiation subject to on-site examination is evaluated on the basis of five (now six) critical dimensions relating to the bank's operations & performance, which are refered to as the component factors. These are capital, Asset Quality, Management, Earnings and liquidity used to reflect the financial performance, financial condition, operations soundness and regulatory compliance of the banking institution. A sixths component relating to sensitivity to market risk has been added to the CAMEL rating to make the rating system more risk-focused, each of the component factors is rated on a scale of 1 (best) to 5 (worst), A Composite rating is assigned as an abridgement of the component rating and is taken as the prime indicator of a bank`s current financial condition .The composite rating ranges between 1 (best) and 5 (worst) and also involves a certain amount of subjectivity based on the examiners` overall assessment of the initiation in view of the individual component assessments.

Composite and component ratings are assigned based on a 5 to 1 numerical scale. A 5 indicates the highest rating, strongest performance and risk management processes, and least degree of supervisory concern, while a 1 indicates the lowest rating, weakest performance, inadequate risk management practices and, therefore, the highest degree of supervisory concern.

The composite rating generally bears a close relationship to the component ratings assigned. However, the composite rating is not derived by computing an arithmetic average of the component ratings. Each component rating is based on a qualitative analysis, as well as quantitative assessment, whenever applicable, of the factors comprising that component and its interrelationship with the other components When assigning a composite rating, some components may be given more weight than others

depending on the situation at the institution. In general, assignment of a composite rating may incorporate any factor that bears significantly on the overall condition and soundness of the institution.

The ability of management to respond to changing circumstances and to address the risks that may arise from changing business conditions, or the initiation of new activities or products, is an important factor in evaluating an institution's overall risk profile and the level of supervisory attention warranted. For this reason, the management component is given special consideration when assigning a composite rating.

The ability of management to identify, measure, monitor, and control the risks of its operations is also taken into account when assigning each composite rating, It is recognized, however, that appropriate management practices vary considerably among financial institutions, depending on their size, complexity, and risk profile. For less complex institutions engaged solely in traditional banking activities and whose directors and senior managers, in their respective roles, are actively involved in the oversight and management of day-to-day operations, relatively basic management systems and controls may be adequate. At more complex institutions, on the other hand, detailed and formal management systems and controls are needed to address their broader range of financial activities and to provide senior managers and directors, in their respective roles, with the information they need to monitor and direct day-to-day activities. All institutions are expected to properly manage their risks. For less complex institutions engaging in less sophisticated risk taking activities, detailed or highly formalized management systems and controls are not required to receive strong or satisfactory component or composite ratings.

COMPOSITE RATINGS

The rating scale ranges from 5 to 1, with a rating of 5 indicating: the strongest performance and risk management practices relative to the institution's size, complexity, and risk profile; and the level of least supervisory concern. A 1 rating indicates: the most critically deficient level of performance; inadequate risk management practices relative to the institution's size, complexity, and risk profile; and the greatest supervisory concern. The composite ratings are defined as follows:

Composite 5

Financial institutions in this group are sound in every respect and generally have components rated 4 or 5. Any weaknesses are minor and can be handled in a routine manner by the board of directors and management. These institutions are the most capable of withstanding the vagaries of business conditions and are resistant to outside influences such as economic instability in their trade area. These institutions are in substantial compliance with laws and regulations. As a result, these institutions exhibit the strongest performance and risk management practices relative to the institution's size, complexity, and risk profile, and give no cause for supervisory concern.

Composite 4

Financial institutions in this group are fundamentally sound. For an institution to receive this rating, generally no component rating should be more severe than 3. Only moderate weaknesses are present and are well within the board of directors' and management's capabilities and willingness to correct. These institutions are stable and are capable of withstanding business fluctuations. These institutions are in substantial compliance with laws and regulations. Overall risk management practices are satisfactory relative to the institution's size, complexity, and risk profile. There are no material supervisory concerns and, as a result, the supervisory response is informal and limited.

Composite 3

Financial institutions in this group exhibit some degree of supervisory concern in one or more of the component areas. These institutions exhibit a combination of weaknesses that may range from moderate to severe; however, the magnitude of the deficiencies generally will not cause a component to be rated more severely than 2. Management may lack the ability or willingness to effectively address weaknesses within appropriate time frames. Institutions in this group generally are less capable of withstanding business fluctuations and are more vulnerable to outside influences than those institutions rated a composite 5 or 4. Additionally, these institutions may be in significant non compliance with laws and regulations. Risk management practices may be less than satisfactory relative to the institution's size, complexity, and risk profile.

These institutions require more than normal supervision, which may include formal or informal enforcement actions. Failure appears unlikely, however, given the overall strength and financial capacity of these institutions.

Composite 2

Financial institutions in this group generally exhibit unsafe and unsound practices or conditions. There are serious financial or managerial deficiencies that result in unsatisfactory performance. The problems range from severe to critically deficient. The Weaknesses and problems are not being satisfactorily addressed or resolved by the board of directors and management. Financial institutions in this group generally are not capable of withstanding business fluctuations. There may be significant noncompliance with laws and regulations. Risk management practices are generally unacceptable relative to the institution's size, complexity, and risk profile. Close supervisory attention is required, which means, in most cases, formal enforcement action is necessary to address the problems.

Composite 1

Financial institutions in this group exhibit extremely unsafe and unsound practices or conditions; exhibit a critically deficient performance; often contain inadequate risk management practices relative to the institution's size, complexity, and risk profile; and are of the greatest supervisory concern. The volume and severity of problems are beyond management's ability or willingness to control or correct. Immediate outside financial or other assistance is needed in order for the institution to be viable. Ongoing supervisory attention is necessary. Institutions in this group pose a significant risk to the deposit insurance fund and failure is highly probable.

2.4 What is the CAMEL rating system?

The Uniform Financial Institution Rating system, commonly referred to the acronym CAMEL rating, was adopted by the Federal Financial Institution Examination Council on November 13 1979, and then adopted by the National Credit Union Administration in October 1987. It has proven to be an effective internal supervisory tool for evaluating the soundness of a financial firm, on the basis of identifying those institutions requiring

special attention or concern. (The United States. Uniform Financial Institutions Rating System 1997, p.1).

Barr et al. (2002 p.19) states that "CAMEL rating has become a concise and indispensable tool for examiners and regulators". This rating ensures a bank's healthy conditions by reviewing different aspects of a bank based on variety of information sources such as financial statement, funding sources, macroeconomic data, budget and cash flow. Nevertheless, Hirtle and Lopez (1999, p. 4) stress that the bank's CAMEL rating is highly confidential, and only exposed to the bank's senior management for the purpose of projecting the business strategies, and to appropriate supervisory staff. Its rating is never made publicly available, even on a lagged basis. CAMEL is an acronym for five components of bank safety and soundness:

- **C**apital adequacy
- **A**sset quality
- **M**anagement quality
- **E**arning ability
- **L**iquidity

2.4.1 Capital Adequacy

Capital adequacy is the capital expected to maintain balance with the risks exposure of the financial institution such as credit risk, market risk and operational risk, in order to absorb the potential losses and protect the financial institution's debt holder. "Meeting statutory minimum capital requirement is the key factor in deciding the capital adequacy, and maintaining an adequate level of capital is a critical element" (The United States. Uniform Financial Institutions Rating System 1997, p. 4).

Karlyn (1984) defines the capital adequacy in term of capital-deposit ratio because the primary risk is depository risk derived from the sudden and considerably large scale of deposit withdrawals. In 1930, FDIC created a new capital model as capital-asset ratios since the default on loans came to expose the greatest risk instead of deposit withdrawals. To gauge the capital adequacy, bank supervisors currently use the capital-risk asset ratio. The adequacy of capital is examined based upon the two most

important measures such as Capital Adequacy Ratio (CAR) or Capital to Risk-weighted Assets ratio, and the ratio of capital to assets.

And interpret what are the capital requirements and which banks meet them; what banks are privatizing or merging; are requirements different for private and state banks?

- Actual capital adequacy ratio is above regulatory minimum
- Good ability to raise capital through government injection or private/public issues

The capital adequacy is estimated based upon the following key financial ratios:

Table 2.1 Capital Ratios Analysis

Ratios	**Formula**
CAR	Tile 1 Capita + Tier 2 Capital / Risk-Weighted Asset
Equity capital to total assets	Total Capital / Total Asset
Leverage Ratio	DEBT / Total Shareholders Equity

This capital ratio is required to meet a minimum of 8% set by the Bank for International Settlement (BIS).However, it is important to note that in some countries the required minimum capital may vary depending on the local regulators; and the bank might like to have as high a capital ratio as possible.

Tier 1 capital (core capital) is shareholder equity capital. Tier 2 capitals (supplementary capital) are the bank's loan loss reserves plus subordinated debt which consists of bonds sold to raise funds. Risk-weighted assets are the weighted total of each class of assets and off-balance sheet asset exposures, with weights related to the risk associated with each type of assets.

Rating of Capital Adequacy

Each of components in the CAMEL model is scored from 1 to 5. In the context of capital adequacy, a rating of 1 indicates a strong capital level relative to the financial institution's risk. Meanwhile, the rating of 5 indicates a critical deficient level of capital, in which immediate assistance from shareholders or external resources is required.

2.4.2 Asset quality

According to Grier (2007), "poor asset quality is the major cause of most bank failures". A most important asset category is the loan portfolio; the greatest risk facing the bank is the risk of loan losses derived from the delinquent loans. The credit analyst should carry out the asset quality assessment by performing the credit risk management and evaluating the quality of loan portfolio using trend analysis and peer comparison. Measuring the asset quality is difficult because it is mostly derived from the analyst's subjectivity.

Frost (2004) stresses that the asset quality indicators highlight the use of non-performing loans ratios (NPLs) which are the proxy of asset quality, and the allowance or provision to loan losses reserve. As defined in usual classification system, loans include five categories: standard, special mention, substandard, doubtful and loss. NPLs are regarded as the three lowest categories which are past due or for which interest has not been paid for international norm of 90 days. In some countries regulators allow a longer period, typically 180 days. The bank is regulated to back up the bad debts by providing adequate provisions to the loan loss reserve account. The allowance for loan loss to total loans and the provision for loan loss to total loans should also be taken into account to estimate thoroughly the quality of loan portfolio.

The asset quality requirements are taken CAMEL approach to Bank Analysis (1996) as below:

- Trends should be noted such as loan concentrations, intra-group lending, and real-estate exposure. For a bank which heavily exposes to lend some specific business sectors and/or business entities, lack of diversification will make its loan portfolio vulnerable. Therefore, AIA designs the portfolio mix shared equally by a third of each of consumer, commercial and industrial loans.
- Loan loss reserve is the money put aside to pay off loan defaults and serve as an insurance to absorb potential losses caused by risky assets.
- Loan growth: has there been a large increase in loan growth and in what type of lending; are prudent standards being followed or are they becoming lax due to competition.

- Non-performing loans: amount, composition, causes for large increase or decreases, how NPLs are defined.
- Reserves: what levels of reserves in relation to total loans and non-performing loans?
- Real-estate exposure: what percentage of loans are real estate based and what type of real estate lending-commercial or residential.
- Intra-group exposure: what level of lending is to affiliated companies; what is the group‘s primary businesses; what is the level of ownership.

The asset quality is estimated based upon the following key financial ratios,

Table 2.2 Asset Quality Ratios Analysis

Ratios	Formula
NPLs to total loans	$\frac{\text{NPLs}}{\text{Total loans}}$
NPLs to total equity	$\frac{\text{NPLs}}{\text{Total Equity}}$
Allowance for loan loss ratio	$\frac{\text{Allowance for loan loss}}{\text{Total loans}}$

Rating of Asset Quality

Each of the components in the CAMEL rating system is scored from 1 to 5. In the context of asset quality, a rating of 1 indicates a strong asset quality and minimal portfolio risks. On the other hand, a rating of 5 reflects a critically deficient asset quality that presents an imminent threat to the institution’s viability.

2.4.3 Management quality

Management quality is basically the capability of the board of directors and management, to identify, measure, and control the risks of an institution‘s activities and to ensure the safe, sound, and efficient operation in compliance with applicable laws and regulations (Uniform Financial Institutions Rating System 1997, p. 6).

Grier (2007) suggests that management is considered to be the single most important element in the CAMEL rating system because it plays a substantial role in a bank's success; however, it is subject to measure as the asset quality examination.

The management has clear strategies and goals in directing the bank's domestic and international business, and monitors the collection of financial ratios consistent with management strategies. The top management with good quality and experience has preferably excellent reputation in the local communication.

Management relates to the competency of the bank's managers, using their expertise's to make subjective judgments, create a strategic vision, and other relevant qualities. Management is the key variable which determines a banks' success. The evaluation of the management is the hardest one to be measured and it is the most unpredictable (Golin, 2001). There are two ratios representing the management in the previous studies, operating costs to net operating income ratio, and operating expenses to assets ratio.

The operating costs to net operating income ratio indicate the percentage of a bank's income that is being used to pay operational costs. It offers information on the management efficiency regarding costs relative to the income it generates. Olweny (2011) adopted the ratio of operating costs to net operating income to indicate the operating efficiency for the commercial banks in Kenya, and he found that the operational costs inefficiency leads to poor profitability.

The operating expenses to assets ratio indicate expenses in relation to the size of a bank. It was similar with cost to income ratio but it was not affected by the changes in interest. Atikogullari (2009) observed the management quality situation of the northern Cyprus banking sector for the period of 2001 to 2007 by using operating expenses to assets ratio. Management Quality can be measured by the following ratios:

Table 2.3 Management Quality Ratios Analysis

Ratios	Formula
Cost to income	Cost / Income
Operating Cost to Net Operating Income	Operating Cost / Operating Income

Management Efficiency is another important element of CAMEL Model, Management is the most important ingredient that ensures the sound functioning of banks. With increased competition in the Indian banking sector, efficiency and effectiveness have become the rule as banks constantly strive to improve the productivity of their employees. Presently it is common to see branches of banks both public and private maintaining extended working hours, flexible time schedules, outsourcing marketing etc. to attract customers. Another development over the year has been the deployment of technology. Almost all banks have upgrade to computerized system. Internet banking, telephone banking have become widespread and most banks offering these services quite comfortably. The ratios in this segment involved subject analysis to measure the efficiency and effectiveness of management.

The management of the bank takes crucial decision depending on its risk perfection. It sets vision and goal for the organization and sees that it achieves them. This parameter is used to evaluate management efficiency as to assign premium to better quality banks and discount poorly managed ones. The following ratios are also used to evaluate management efficiency.

Business per employee

This ratio's shows the productivity of human forces of the bank. It is used as tool to measure the efficiency of all the employee of the bank, in generating business for the bank. It is arrived by dividing the total business by total number of employees. The business includes the sum of total advances, total deposits in a particular year.

Profit per employee

This ratio shows the surplus earned per employee. It is arrived at by dividing profit after tax earned by the bank by total number of employees. The higher the ratio, the higher the efficiency of the management.

Rating of Management

Each of the components in the CAMEL rating system is scored from 1 to 5. In the context of management, a rating of 1 is assigned to note the management and board of directors are fully effective. On the other hand, the rating of 5 is applicable to critically deficient management. Replacing or strengthening may be needed to achieve sound and safe operations.

2.4.4 Earning ability

This rating reflects not only the quantity and trend in earning, but also the factors that may affect the sustainability of earnings. Inadequate management may result in loan losses and in return require higher loan allowance or pose high level of market risks. The future performance in earning should be given equal or greater value than past and present performance. (Uniform Financial Institutions Rating System 1997, p.7).

In accordance with Grier (2007)'s opinion, a consistent profit not only builds the public confidence in the bank but absorbs loan losses and provides sufficient provisions. It is also necessary for a balanced financial structure and helps provide shareholder reward. Thus consistently healthy earnings are essential to the sustainability of banking institutions. Profitability ratios measure the ability of a company to generate profits from revenue and assets. There are requirements that is used as to evaluate Earning like:

- Majority of earnings is annuity in nature (low volatility).
- The growth trend of the past years is consistent with or better than industry norm and there are multiple sources of income (both interest and non-interest income).

The profitability is estimated based upon the following key financial ratios,

Table 2.4 Earning ability Ratios Analysis

Ratios	**Formula**
Net interest income Margin (NIM)	Net Interest Income / Total Loan & Advance
Return on asset (ROA)	Net Interest Income / Total asset
Return on equity (ROE)	Net Interest Income / Shareholder's Equity

Rating of Earning Ability

Each of the components in the CAMEL rating system is scored from 1 to 5. In the context of earning, a rating of 1 reflects strong earnings that are sufficient to maintain adequate capital and loan allowance, and support operations. On the other hand, a rating of 5 reflect consistent losses and represents a distinct threat to the institution's solvency through the erosion of capital.

2.4.5 Liquidity

There should be adequacy of liquidity sources compared to present and future needs, and availability of assets readily convertible to cash without undue loss. The fund management practices should ensure an institution is able to maintain a level of liquidity sufficient to meet its financial obligations in a timely manner; and capable of quickly liquidating assets with minimal loss.

The liquidity ratio expresses the degree to which a bank is capable of fulfilling its respective obligations. Banks makes money by mobilizing short-term deposits at lower interest rate, and lending or investing these funds in long-term at higher rates, so it is hazardous for banks mismatching their lending interest rate.

The liquidity requirements are taken into Bank Analysis as below:

- Majority of the funding is coming from customer's deposits, and no concentration of funding sources.
- Is there a maturity or interest rate mismatch?
- Does the central bank impose reserve requirements?

The profitability is estimated based upon the following key financial ratios,

Table 2. 5 Liquidity Ratios Analysis

Ratios	**Formula**
Customer deposits to total assets	$\frac{\text{Total Customer Deposit}}{\text{Total Assets}}$
Total loan to customer deposits (LTD)	$\frac{\text{Total Loan}}{\text{Total Customer Deposit}}$

Rating of Liquidity

Each of the components in the CAMEL rating system is scored from 1 to 5. In the context of liquidity, a rating of 1 represents strong liquidity levels and well-developed funds as the institution has access to sufficient sources of funds to meet present and anticipated liquidity needs. On the other hand, the rating of 5 signifies critical liquidity-deficiency, and the institution demands immediate external assistance to meet liquidity needs. (Uniform Financial Institutions Rating System 1997, p.9).

2.5 The significance of CAMEL rating framework in banking supervision

Providing a general framework in evaluating overall performance of banks is of great importance due to the increasing integration of global financial markets. CAMEL model reflects excellently the conditions and performances of banks over years as well as enriches the on-site and off-site examination to bring better assessments towards banks' conditions. Its purpose is to provide an accurate and consistent evaluation of a bank's financial condition and operations in the areas such as capital, asset quality, management, earning ability and liquidity. Muhammad (2009) claims that the strength of these factors would determine the overall strength of the bank. The quality of each component further underlines the inner strength and how far it can take care of itself against the market risks.

Furthermore, it serves the purpose of summarizing the significant compliance information needed for the regulators. It also assists them to ensure the degree of supervisory concern and type of supervisory response to generate timely warnings to minimize the adverse effects on banks. In the financial crisis of 2008, this rating was being used by American government to respond to the crisis to help decide which banks needed the special help and which not as part of its capitalization program authorized by the Emergency Economic Stabilization Act of 2008.

Barker and Holdsworth (1993) find that the CAMEL system is useful, even after controlling for a wide range of publicly available information about the condition and performance of banks. This composite index further acts as a bank's failure predicting model. The rating is assigned based on both quantitative and qualitative information of the bank. If a bank's index is less than two, it is regarded as a high-quality bank, whereas institutions with grade four or five are rated to be insolvent (Curry, Elmer and Fissel, 2009.) The up-to-date examination ratings help identify if the banks require increased supervisory attention well before they actually fail. Although Gaytán and Johnson (2002) argue that the model is only parallel with the performance of the bank at the time of the examination, while variables in banks are highly volatile to market forces; the CAMEL model is still very much popular among regulators due to its effectiveness.

2.6 Empirical Literature

Jie Liu (2011) examines the impact of independent variables from CAMEL model on bank performance in China's banking sector. The independent variables from CAMEL model include: capital adequacy, asset quality, management, earning and liquidity. The sample size for the research was the 13 Chinese banks listed in Shanghai Stock Exchange and Shenzhen Stock Exchange from 2008 to 2011. Jie Liu adopted fixed effects multiple linear regression model in his study to measure the relationship between internal determinants from CAMEL model and bank performance. The findings of this research show that return on assets can be influenced by shareholders' risk-weighted capital adequacy ratio, NPL to total loans ratio, costs to income ratio, net interest rate margins, and loans to deposits ratio. Meanwhile, this study indicates that

return on equity can be influenced by costs to income ratio, operating expenses to assets ratio, and Loans to deposits ratio.

Suvita Jha and Xiaofeng Hui (2012) compare the financial performance of different ownership structured commercial banks in Nepal based on their financial characteristics and identify the determinants of performance exposed by the financial ratios, which were based on CAMEL Model. Eighteen commercial banks for the period 2005 to 2010 were financially analyzed. In addition, econometric model (multivariate regression analysis) by formulating two regression models used to estimate the impact of capital adequacy ratio, non-performing loan ratio, interest expenses to total loan, net interest margin ratio and credit to deposit ratio on the financial profitability namely return on assets and return on equity of these banks. The result shows that public sector banks are significantly less efficient than their counterpart however domestic private banks are equally efficient to foreign-owned (joint venture) banks. Furthermore, the estimation results reveal that return on assets was significantly influenced by capital adequacy ratio, interest expenses to total loan and net interest margin, while capital adequacy ratio had considerable effect on return on equity.

Maryam Azizi and DR. Yusef Ahadi Sarkani (2014) review the financial performance of Mellat Bank using CAMEL model and each of the model dimensions examined using trend analysis method and both mean and standard deviation statistics. In the process they determined all the model criteria had an ascending trend in the period under study. In the inferential statistics section, again the relationship between model variables and the financial performance of Mellat Bank was studied and examined using two linear and multiple regressions as well as OLS method. Results of the study indicate that there is a positive significant relationship between the indices of liquidity, quality of management and earnings with financial performance. Yet, no relationship was seen between capital adequacy and assets quality with bank financial performance and multiple regression test showed only a positive significant relationship with financial performance in management quality section. As a result, Mellat Bank has better financial performance in management quality section.

Christopher Ifeacho (2014) investigates the impact of bank-specific variables and selected macroeconomic variables on the South African banking sector for the period 1994-2011 using the capital adequacy, asset quality, management, earnings, and liquidity (CAMEL) model of bank performance evaluation. The study employs data in annual frequency from South Africa's four largest banks, namely, ABSA, First National Bank, Nedbank, and Standard Bank. These banks account for over 70% of South Africa's banking assets. Using return on assets (ROA) and return on equity (ROE) as measures of bank performance, the study finds that all bank-specific variables are statistically significant determinants of bank performance. Specifically, the study shows that asset quality, management quality, and liquidity have a positive effect on both measures of bank Performance, which is consistent with a priori theoretical expectations. Capital adequacy, however, exhibits a surprising significant negative relationship with ROA, while its relationship with ROE is significant and positive as expected. Except for interest rates (in the ROA model), unemployment rate (in the ROA model), and the rate of inflation (in the ROE model), the rest of the macroeconomic variables are statistically insignificant. The study reveals that bank performance is positively related to interest rates and negatively related to unemployment rates and interest rates.

CHAPTER THREE

3. RESEARCH DESIGN & METHEDOLOGY

The preceding chapter presented the review of the existing evidence on the CAMEL model. The results from a review of the literature are used to establish expectations for the evaluation & ranking of Ethiopian Commercial Banks financial Performance using CAMEL model and testing whether there is a relationship between the CAMEL model variable and performance as measured by Return on Asset (ROA) and Return on Equity (ROE). This chapter presents the underlying principles of research methodology and the choice of the appropriate research method for the thesis. The chapter is organized as follows. Section 3.1 discusses the research method adopted, Section 3.2 discuss sample design, Section 3.3 is Description & Measurement of Variable, section 3.4 & 3.5 discuss Model Specification & data Collection while the last sections 3.6 discuss Data analysis techniques.

3.1 Research Method Adopted

The study uses a descriptive financial analysis to describe, measure, compare and classify the financial performance of Ethiopian Commercial Banks and as well as applied an econometric multivariate regression model to test the significance of variable on performance of Ethiopian Commercial Banks.

The Profitability ratios (ROA & ROE) are assumed as dependent variable while capital adequacy, Asset Quality, Management, Earning and liquidity ratios are as independent variable.

3.2 Sample Design

The study takes the whole population of commercial banks registered by National bank of Ethiopia and currently under operation in the country. At present, two government owned and Sixteen private banks operating throughout the country. However, the population size reduced to fourteen because the newly established private banks do meet five years data that is required for the purpose of the analysis.

3.3 Description and Measurement of Variables

3.3.1 Dependent Variable

In the literature, there are two major alternatives measures of profitability, namely ROA and ROE.ROA reflects the ability of banks management to generate profits from the bank's assets, although it may be biased due to off-balance-sheet activites.ROE shows the return to shareholders on equity. All profitability measures included in the study are described below;

Return on Asset (ROA)

The ROA reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities. Average assets were used in this study, in order to capture any differences that occurred in assets during the fiscal year. ROA can be calculated as:

$$Return\ On\ Asset(ROA) = \frac{Net\ Profit\ After\ Tax}{Total\ Asset}$$

This is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that bank owns.

Return on Equity (ROE)

The Return on Equity measures the Profitability of equity funds invested in the bank it shows the profit earned per birr of capital invested. It regarded as a very important measure because it reflects the productivity of the ownership (or risk) capital employed in the bank. ROE can be calculated as:

$$Return\ On\ Equity(ROE) = \frac{Net\ Profit\ After\ Tax}{Total\ Equity\ Capital}$$

3.3.2 Independent Variable

The major independent variables (determinants) or factors of the CAMEL model were capital adequacy, asset quality, Management efficiency and liquidity status which shall be proxies by bank specific factors in relation to performance.

These variables can be measured by the following formulas:

- Capital adequacy: the study used gross capital to total asset ratio to measure Capital adequacy.

$$Capital\ Adequecy = \frac{Gross\ Capital}{Total\ Assetes}$$

Gross Capital includes paid up capital, retained earnings and other reserves of the bank

- Asset quality: the study measures by the ratio of Provision for loan Loss to total loans.

$$Asset\ Quality = \frac{Provision\ for\ loan}{Total\ Loan}$$

- Managerial efficiency: the ratio of Non-interest expense to Net Interest income plus non-Interest Income.

$$Managerial\ Efficiency = \frac{Non{-}interest\ Expense}{Net\ Interest\ Income\ Plus\ Non\ Interest\ Incomel\ Loan}$$

- Earnings ratio: the study used the ratio of net interest income to total interest Income (NIM).

$$Earning\ ratio = \frac{Net\ Interest\ Income}{Total\ Interest\ Income}$$

- Liquidity ratio: the ratio of total loans to total Deposits was used.

$$Liquidity\ ratio = \frac{Total\ Loan}{Total\ Deposit}$$

3.4 Model Specification

Model 1 is used to test the relationship between independent variable and ROA:

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 AQ_{it} + \beta_3 MGT_{it} + \beta_4 ERN_{it} + \beta_4 LIQ_{it} + \varepsilon$$

Model 2 is used to test the Relationship between independent Variable and ROE:

$$ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 AQ_{it} + \beta_3 MGT_{it} + \beta_4 ERN_{it} + \beta_4 LIQ_{it} + \varepsilon$$

Subscript I refers to firm i, and subscript t refers to year t.

Where

ROA=Return on Asset

ROE=Return on Equity

CAR=Capital Adequacy ratio

AQ=Asset Quality Ratio

MGT=Management efficiency ratio

ERN=Earnings ratio

LIQ=Liquidity ratio

3.5 Data Collection

In order to analyze the performance of the commercial banks in Ethiopia the study collected audited financial statement of fourteen banks (CBE, CBB, DB, AIB, BOA, WB, UB, NIB, LIB, CBO, ZB, OIB,BUIB and BIB) for five consecutive years i.e. from 2010 up to 2014. The secondary data that were collected through structured document reviews are mainly from the records held by National bank of Ethiopia and banks themselves.

3.6 Data analysis techniques

To comply with the objective, the paper was primarily based on panel data, which was collected through structured document review. As noted in Baltagi (2005) the advantage of using panel data is that it controls for individual heterogeneity, less collinearity among variables and tracks trends in the data something which simple time-series and cross- sectional data cannot provide. Thus, the collected panel data was

analyzed using descriptive statistics, correlations and linear regression analysis. Mean values and standard deviations were used to analyze the general trends of the data from 2010 to 2014.A multiple linear regressions model and t-static was used to determine the relative importance of each independent variable in influencing profitability. The study conducted regression analysis using EVIEWS econometric software package, to test the casual relationship between the firms' profitability and five determinant factors.

As noted in Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, to this end diagnostic tests were performed to ensure whether the assumptions of the CLRM are violated or not in the model. The model misspecification tests include:-

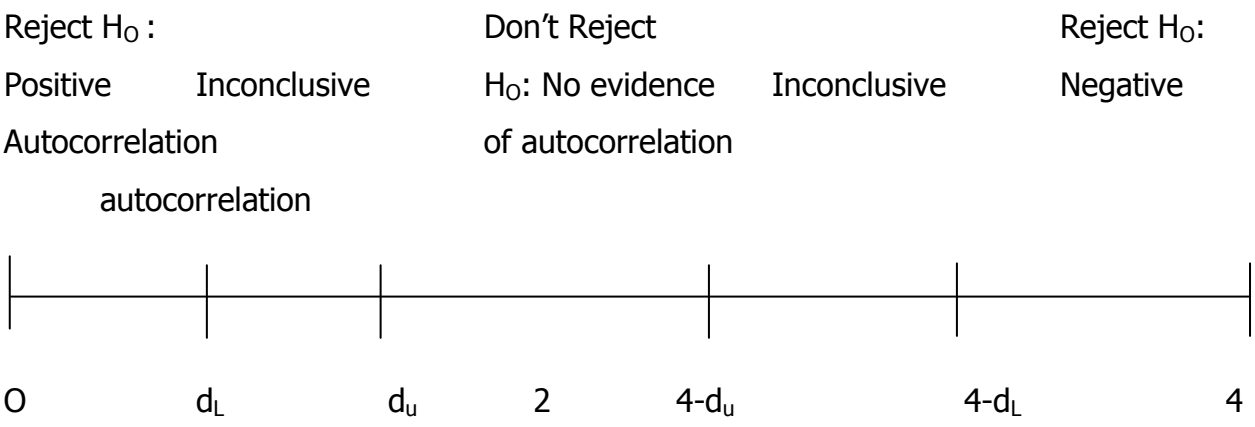
Test for Heteroscedasticity

To test for the presence of heteroscedasticity, the popular white test would be employed in this study. This test involves testing the null hypothesis that the variance of the errors is constant (homoscedacicity) or no heteroscedasticity.

Test for Autocorrelation

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

Rejection and non-rejection regions for Durbin-Watson Test



Durbin-Watson has 2 critical values: an upper critical value (dU) and a lower critical value (dL).

Test for Normality

As noted in Brooks (2008) a normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. One of the most commonly applied tests for normality; the Bera-jarque formalizes these ideas by testing whether the coefficient of skewness and the coefficient of excess kurtosis are zero and three respectively. Brooks (2008) also states that, if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-jarque statistic would not be significant at 5% significant level.

Test for Multicollinearity

To test the independence of the explanatory variables the study used a correlation matrix of independent variables. The problem of multicollinearity usually arises when certain explanatory variables are highly correlated. Usually, as noted by Hair et al. (2006) correlation coefficient below 0.9 may not cause serious muticollinearity problem. In contrary to this, Kennedy (2008) argued that as any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable result. Considering that Hair et al. (2006) is the most popular reference in multivariate analysis, this study uses their guideline for purpose of multicollinearity.

Chapter Four

4. Findings and Discussion

The results and discussions of the study are described under the following headings:-

- Capital Adequacy Analysis
- Asset quality analysis
- Management capability analysis
- Earning analysis and
- Liquidity analysis

4.1 Capital Adequacy Analysis

The giant state owned bank Commercial Bank of Ethiopia maintained the highest average capital and Asset during the study period with the amount of 8 Billion birr and 158 Billion birr respectively.

The second and third highest average asset was Birr 17 Billion and birr 13 billion of Dashen Bank and Awash International Bank respectively. In respect to the capital amount Dashen , Awash and Nib international bank maintained approximately the same amount of capital Birr 2 billion during the period.

The newly established bank (i.e 2009) Berhan International bank and Bunna International Bank maintained the last position in the industry with the average capital around 0.3 billion birr and the average total asset amount of around 2 billion birr.

Capital adequacy is a reflection of the inner strength of banks, which would stand it in good stead during the times of crisis. Capital adequacy is the capital to maintain the balance with the risk exposure of the financial institution such as credit risk, market risk and operational risk, in order to absorb the potential loss and protect the financial institution's debt holder in addition to this meeting a minimum level of statutory requirement is also a key factor. The capital adequacy ratio measured by the ratio of total capital to total asset.

According to the calculation presented below Bunna International Bank is at the top position with the average capital adequacy ratio of 24.15 percent followed by Birhan International Bank and Corporate Bank of Oromia whereas Commercial Bank Of Ethiopia stood at the last position with the ratio of 5.39 Percent. The average capital adequacy ratio for five year for all banks is 14.26 Percent.

The result indicates that Bunna international bank is in a better position to withstand potential loss and protect the financial institution debt holder where as Commercial Bank of Ethiopia lacks inner strength to do so.In order to cope up with the big risk exposure of the bank the shareholders of the Commercial Banks of Ethiopia (CBE) should inject additional capital to the bank.

Table 4.1 Capital Adequacy Ratio Analysis

Bank	2010	2011	2012	2013	2014	Average	RANK
CBE	7.49	5.48	4.86	4.59	4.54	5.39	14
CBB	10.13	10.36	8.05	9.93	9.37	9.57	13
DB	9.09	9.53	10.43	10.36	11.83	10.25	12
AIB	11.84	12.93	13.49	13.54	11.75	12.71	8
BOA	9.32	9.08	11.00	10.93	13.56	10.78	11
WB	18.32	16.59	19.22	17.61	18.60	18.07	4
UB	10.81	11.67	12.54	12.04	13.26	12.06	9
NIB	15.35	16.46	18.46	18.22	18.28	17.36	5
LIB	17.73	19.52	17.93	18.42	17.38	18.20	3
CBO	10.69	9.83	11.37	10.64	14.83	11.47	10
ZB	15.02	14.92	11.72	15.19	16.73	14.72	7
OIB	18.95	15.09	15.70	14.00	12.16	15.18	6
BUIB	35.22	29.76	21.03	17.59	17.16	24.15	1
BIB	26.97	16.41	18.38	17.36	19.71	19.77	2
Average	**15.50**	**14.12**	**13.87**	**13.60**	**14.23**	**14.26**	

4.2 Asset Quality Analysis

Asset quality determines the healthiness of financial institutions against loss of value in asset as asset impairment risks the solvency of financial institutions. The Asset quality indicators highlight the use of non-performing loans ratios (NPLs) which are the proxy of asset quality and the allowance or provision to loan loss reserve. The bank is regulated to back up the bad debts by providing adequate provisions for loan loss. The ratio of provision for loan loss to total loans take in to account to measure the quality of loan portfolio. With this framework, the asset quality is assessed by taking the ratio of loan loss provision to total loan. The lower the loan loss provision to total loan ratio indicate the quality of the asset of the bank is relatively better than the other banks.

Relatively the highest average loan and advance among the commercial banks was Birr 57 billion from Commercial Bank of Ethiopia followed by birr 8 billion and 6 billion from Dashen Bank and Awash international bank. Whereas in average relatively the lowest loan and advance extended to customer Birr 0.6 and 0.7 billion by Berhan International Bank and Bunna International Bank respectively both the banks established in 2009GC.

With regard to providing provision for loan loss the highest provision was Birr 1.4 billion by commercial bank and followed by Construction & Business bank, Awash International bank and Bank of Abyssinia with almost equal provision for loan loss amount 200 Million birr for the loan amount Birr 2,8 and 6 billion respectively. Whereas the minimum provision provided for loan loss was Birr 5 and 9 Million by Bunna International Bank and Birhan International Bank.

With this in mind the result of asset quality ration calculated and presented in table 4.2. With Regard to asset Quality ratio Buna International Bank had better quality of asset followed by Oromia international bank and Berhan International Bank. Whereas Construction and Business bank has the poorest asset quality.

Table 4.2 Asset Quality ratio Analysis

Bank	2010	2011	2012	2013	2014	Average	RANK
CBE	1.85	2.45	2.21	2.61	2.68	2.36	7
CBB	10.91	10.48	9.70	4.38	3.52	7.80	14
DB	2.18	1.99	2.15	2.25	1.85	2.08	6
AIB	4.71	3.64	2.70	2.30	2.27	3.13	11
BOA	7.41	3.33	2.57	1.99	1.79	3.42	12
WB	3.97	4.54	2.43	2.24	1.67	2.97	9
UB	3.65	2.77	2.33	1.86	1.44	2.41	8
NIB	3.90	4.12	2.71	2.50	2.10	3.07	10
LIB	1.62	1.45	1.55	1.30	1.34	1.45	4
CBO	2.53	2.00	1.44	1.72	1.83	1.91	5
ZB	1.56	1.78	1.79	8.52	8.83	4.50	13
OIB	1.14	1.06	1.29	1.46	1.33	1.26	2
BUIB	1.01	1.13	1.12	1.16	1.10	1.10	1
BIB	1.00	1.12	1.17	1.52	1.63	1.29	3
Average	**3.39**	**2.99**	**2.51**	**2.56**	**2.38**	**2.77**	

4.3 Management Efficiency Analysis

Management quality is basically the capability of the board of directors and management, to identify, measure and control the risks of an institution's activities and to ensure the safe, sound and efficient operation in compliance with applicable laws and regulations.

The performance of Management capacity is usually qualitative and can be understood through the subjective evaluation of Management systems, organization culture and control mechanisms and so on. However, the capacity of the management of a bank can also be gauged with the help of certain ratios of off-site evaluation of a bank. Such can include the ability of the management to deploy its resources, aggressively to maximize the income, utilize the facilities in the bank productively and reduce costs etc.

In this research the management efficiency is measured by taking the ratio of Non Interest expense to Net Interest Income plus Non Interest Income. The lower this ratio indicates the management capability to control or minimize cost per unit of revenue generated is relatively better than other banks.

During the five year period the highest aggregate amount of Net interest income and Non Interest income was birr Birr 9 billion of the Commercial Bank of Ethiopia followed by Dashen Bank and Awash International Bank with the amount of Birr 1 billion and 900 Million. whereas the lowest amount of aggregate Net Income and Noninterest income was Birr 87 and 100 million from Bunna International Bank and Berhan International bank.

With regard to the lowest average Noninterest expense incurred by Berhan International bank followed by Bunna International Bank have average amount of birr 59 and 95 Million respectively. Whereas the highest expense incurred was birr 2 billion by the industry giant Commercial Bank of Ethiopia.

In light of the above Commercial bank of Ethiopia is at the top position with the ratio of 25.31 Percent followed by Dashen bank and Awash international bank with 36.01 and 38.83 percent respectively Berhan International bank is at the last position with 78.40 Percent as can be seen from table 4.3.

Table 4.3 Management efficiency Ratio analysis

Bank	2010	2011	2012	2013	2014	Average	RANK
CBE	25.13	27.90	19.86	24.04	29.60	25.31	1
CBB	36.22	44.40	48.08	48.38	71.14	49.64	11
DB	36.01	34.18	32.08	38.73	39.06	36.01	2
AIB	34.03	29.66	35.75	42.10	42.63	36.83	3
BOA	42.53	43.13	43.92	42.01	49.50	44.22	8
UB	39.05	33.59	35.77	53.56	52.75	42.95	7
NIB	38.89	35.95	35.89	43.25	48.83	40.56	6
LIB	45.14	45.73	41.66	37.53	52.61	44.53	9
CBO	64.28	54.27	42.89	43.44	39.10	48.80	10
ZB	37.82	31.41	38.50	59.34	35.30	40.47	5
OIB	66.93	52.98	62.54	61.89	53.93	59.65	12
BUIB	99.72	55.62	54.89	48.93	55.30	62.89	13
BIB	193.27	47.44	42.63	48.65	60.02	78.40	14
Average	**56.73**	**40.87**	**40.71**	**45.26**	**48.61**	**46.44**	

4.4 Earning Analysis

The 'Earnings is a Conventional Parameter of measuring financial performance. The quality of earning represents the sustainability and growth of future earnings, value of a banks lucarativeness and its competencey to maintain quality consistently. The net interest margin measures how large the spread between interest revenues and interest cost over earning assets and the pursuit of the cheapest source of funding (Rose et al.,2006). In the present study the earnings ratios calculated for the purpose of earnings analysis is Net Interest Income to Loan and advance of the bank are depicted in the table 4.4.

Commercial Bank of Ethiopia provides the highest loan during the study period with the amount of birr 57 billion followed by birr 8 and 6 billion by Dashen Bank and Awash International bank. The lowest loan extended to customer by Bunna International Bank and Berhan International Bank with the average amount of Birr 700 and 600 Million.

The highest average net interest income during the study period was birr 5 billion by Commercial Bank of Ethiopia followed by Dashen Bank and Awash International Bank with equal amount of 400 million each. Zemen Bank and Berhan International Bank earn the lowest average net Interest income with equal amount of birr 41 Million and Bunna International bank birr 55 Million.

On the basis of five year average net income to Loan and advance ratio Commercial Bank of Ethiopia is at the top followed with the 8.84 percent followed by wogagen bank and Buna International Bank whereas Construction and Business Bank is at the last position with the average annual earnings of 5.16 percent.

Table 4.4 Earnings Ratio analysis

Bank	2010	2011	2012	2013	2014	Average	RANK
CBE	8.32	8.24	8.07	10.01	9.55	8.84	1
CBB	5.73	5.33	4.60	5.04	5.09	5.16	13
DB	4.64	4.48	6.00	5.99	5.91	5.40	12
AIB	4.72	4.65	6.97	6.84	8.09	6.25	10
BOA	4.27	6.28	7.42	6.93	8.11	6.60	8
WB	6.93	7.38	8.46	8.81	9.32	8.18	2
UB	5.61	5.92	7.83	7.52	8.64	7.11	6
NIB	6.93	7.72	7.60	8.49	8.40	7.83	3
LIB	6.37	7.30	7.91	8.70	8.76	7.81	4
CBO	6.59	6.47	8.15	8.08	8.65	7.59	5
ZB	2.19	3.03	3.62	3.62	6.36	3.77	14
OIB	4.11	4.46	6.57	8.15	8.81	6.42	9
BUIB	3.40	5.73	6.10	8.56	9.32	6.62	7
BIB	2.62	4.94	5.92	4.89	9.05	5.48	11
Average	**5.17**	**5.85**	**6.80**	**7.26**	**8.15**	**6.65**	

4.5 Liquidity Ratio

Liquidity management is one of the most important functions of a bank. If funds tapped are not properly utilized, the institution will suffer loss. Idle cash balance in hand has no yield. On the other hand if the bank does not keep balanced liquid cash in hand, it cannot be able to pay the demand withdrawal of depositors, as well as, installment of creditors and ultimately payment for other contingent liabilities. These will lead overtrading position to the institution and create problems to borrow funds at high rate. Proper balanced liquidity should be maintained by avoiding inadequate cash position, or excess cash position. The liquidity position of the banks understudy is presented in tables 4.5.

As to the deposit amount the highest was birr 121 billion by Commercial Bank of Ethiopia followed by Dashen bank and Awash International bank with the amount birr 14 and 10 billion respectively. Whereas Bunna International bank & Berhan International bank shows the lowest i.e Birr 1 billion by.

The liquidity Position of the banks was evaluated by the ratio of total Loan to total deposit ratios the higher this ratio indicates that bank has relatively better liquidity position than the other competitor bank.

According to this ratio Bunna international bank is at the top with the average liquidity ratio of 70.10 percent followed by Nib International Bank and wogagen bank with 63.37 and 58.17 percent respectively. Whereas Commercial Bank of Ethiopia is at the last position with the ratio of 46.6 Percent.

Table 4. 5 Liquidity Ratio Analysis

Bank	2010	2011	2012	2013	2014	Average	RANK
CBE	43.95	42.43	53.45	46.95	46.22	46.60	14
CBB	74.28	68.88	51.27	47.95	47.62	58.00	4
DB	49.77	52.51	57.76	55.91	54.34	54.06	10
AIB	51.52	51.48	59.80	61.46	61.01	57.05	8
BOA	61.36	54.58	57.56	55.34	56.65	57.10	7
WB	63.06	48.85	61.92	62.12	54.91	58.17	3
UB	55.32	54.02	60.46	58.42	53.92	56.43	9
NIB	61.69	53.64	63.53	68.26	69.72	63.37	2
LIB	57.39	52.13	55.89	62.59	58.15	57.23	5
CBO	52.61	40.49	49.45	47.39	68.11	51.61	12
ZB	55.80	55.50	56.48	54.67	47.18	53.93	11
OIB	44.95	43.36	48.16	53.15	51.25	48.17	13
BUIB	80.02	74.55	72.17	61.35	62.43	70.10	1
BIB	64.37	47.79	53.62	61.45	58.89	57.22	6
Average	**58.29**	**52.87**	**57.25**	**56.93**	**56.46**	**56.36**	

4.6 Composite Ranking

In order to assess the overall Ranking of Commercial Banks in Ethiopia, the composite rating has been calculated from the individual ranking of the banks for the period of 2010-2014 and results shown in are in the table 4.6.

On the basis of CAMEL model analysis, Wogagen bank stood at first position followed by Bunna International Bank and Lion International Bank while Construction and Business Bank secured the least position.

Table 4.6 Composite Rating

Bank	C	A	M	E	L	Average	Rank
CBE	14	7	1	1	14	7.4	6
CBB	13	14	11	13	4	11	14
DB	12	6	2	12	10	8.4	9
AIB	8	11	3	10	8	8.2	8
BOA	11	12	8	8	7	9.2	12
WB	4	9	4	2	3	4.4	1
UB	9	8	7	6	9	7.8	7
NIB	5	10	6	3	2	5.2	4
LIB	3	4	9	4	5	5	3
CBO	10	5	10	5	12	8.4	9
ZB	7	13	5	14	11	10	13
OIB	6	2	12	9	13	8.4	9
BUIB	1	1	13	7	1	4.6	2
BIB	2	3	14	11	6	7.2	5

4.7 Overall Financial Performance of the Banks Under Study

The overall Financial Performance of the Banks is exhibited in the table 4.7.This table includes Return on asset as well as return on equity of all Banks to see the overall financial performance of the banks. Based on the ratio of return on asset Zemen bank is at the top with the average ratio of 4.25 percent followed by wogagen bank and Nib International Bank with the average Return on Asset ratio of 3.60 and 3.27 percent. Oromia International bank,Buna International Bank and Birhan International Bank holds the last position with the average Return on asset ratio of 2.05,1.87 and 1.17 percent respectively.

In terms of Return on Equity Ratio Commercial Bank of Ethiopia is at the top with the average ratio of 55.88 percent followed by Dashen Bank and Zemen Bank with the average Return on Asset ratio of 30.78 and 29.04 percent. Oromia International bank, Buna International Bank and Birhan International Bank holds the last position with the average Return on asset ratio of 14.03, 9.19 and 8.90 percent respectively. Return on asset and Return on equity ratios as an additional measure of Earning in the camel model variable to capture unaddressed dimension of the earning; which can also change the overall ranking. In terms of ROA & ROE Wogagen Bank is at the top position followed by Nib bank and Lion International Bank whereas Construction and Business bank ranks last position i.e remain the same position as composite rating table 4.6 .

Table 4. 7 profitability measures and CAMEL factors

BANK	ROA		ROE		CA		AQ		MGT		Earning		Liquidity		Factor Rank	
	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank
CBE	2.88	7	55.88	1	5.39	14	2.36	8	25.31	1	10.51	1	46.60	14	6.57	4
CBB	2.12	11	22.09	8	9.57	13	7.80	14	49.64	11	5.16	13	58.00	4	10.57	14
DB	3.15	5	30.78	2	10.25	12	2.08	6	36.01	2	5.40	12	54.06	10	7.00	6
AIB	3.24	4	25.48	4	12.71	8	3.13	11	36.83	3	6.25	10	57.05	8	6.86	5
BOA	2.50	10	23.60	5	10.78	11	3.42	12	44.22	8	6.60	8	57.10	7	8.71	11
WB	3.60	2	19.99	9	18.07	4	2.97	9	39.82	4	8.18	2	58.17	3	4.71	1
UB	2.77	8	23.11	6.5	12.06	9	2.41	7	42.95	7	7.11	6	56.43	9	7.50	8
NIB	3.27	3	18.96	10	17.36	5	3.07	10	40.56	6	7.83	3	63.37	2	5.57	2
LIB	2.98	6	16.40	11	18.20	3	1.45	4	44.53	9	7.81	4	57.23	5	6.00	3
CBO	2.73	9	23.11	6.5	11.47	10	1.91	5	48.80	10	7.59	5	51.61	12	8.21	10
ZB	4.25	1	29.04	3	14.72	7	4.50	13	40.47	5	3.77	14	53.93	11	7.71	9
OIB	2.05	12	14.03	12	15.18	6	1.26	2	59.65	12	6.42	9	48.17	13	9.43	13
BUIB	1.87	13	9.19	13	24.15	1	1.10	1	62.89	13	6.62	7	70.10	1	7.00	6
BIB	1.47	14	8.90	14	19.77	2	1.29	3	78.40	14	5.48	11	57.22	6	9.14	12
Average	**2.78**		**22.90**		**14.26**		**2.77**		**46.44**		**6.77**		**56.36**			

4.8 Descriptive statistics of variables

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

As it can be seen from descriptive statistics table below Return on Equity & Return on Asset have a positive mean with the value of 22.90 and 2.78 respectively. There is greater variation in the data set of Return on Equity as compared to Return on Asset This is because return per unit of Birr capital employed have more difference than return on asset data set. This can be more clear when you see the maximum and minimum values i.e ROE is 70.35 and -5.87 percent whereas ROA is 5.25 and -1.58 percent respectively.

Table 4.8 Descriptive Statistics of variables

Dependent Variable	Mean	Median	Maximum	Minimum	Std. Dev.
ROE	22.89662	21.14340	70.35000	-5.865687	12.51062
ROA	2.776796	2.768760	5.250452	-1.582019	1.001849
Independent Variable	**Mean**	**Median**	**Maximum**	**Minimum**	**Std. Dev.**
CA	14.26164	13.54740	35.22122	4.537911	5.371783
AQ	2.751161	2.051339	10.91368	1.000000	2.253513
MGT	46.43510	42.62947	193.2733	19.86000	21.69179
EAR	6.64696	6.887526	10.01191	2.194496	1.861287
LIQ	56.36010	55.42203	80.02006	40.49138	8.051818

Source; E-Views Output

The average return on equity per Birr investment in the commercial banks of Ethiopia is 22.90 Percent whereas the average return per unit of asset employed in the banks is 2.78 percent.

The mean independent variable Capital adequacy, Asset quality, Management efficiency, Earning and liquidity ratios have positive values with the amount of 14.26, 2.75, 46.44, 59.03 and 56.36 respectively. When we see the standard deviation value of the independent variable data set management efficiency and earnings ratio is more variable than the other independent variables having value 21.69 and 10.97 respectively. This can be more understandable by looking the gap between the maximum and minimum value of the management efficiency and earnings ratio. The maximum value in the data set of management efficiency ratio and earnings ratio is 193.27 and 77.49 whereas the minimum value is 19.86 and 26.97 percent respectively.

The mean value of capital adequacy ratio of commercial banks of Ethiopia as measured by total capital to total asset is 14.26 percent. The maximum capital maintained in the data set of the bank is 35.22 Percent where as the minimum capital maintained in the banks during the period is 4.54 percent.

The mean value of Asset Quality ratio as measured by the ratio of provision for loan loss to total loan in the data set is 2.75 percent. The maximum provision maintained in the data set 10.91 percent and the minimum one percent of the total loan amount of the banks during the five year period. The standard deviation of the asset Quality 2.53 which is the lowest among the Independent variable this shows there is low variability in the data of asset quality ratio.

In this study the management efficiency of the Commercial Banks of Ethiopia measured by the ratio of Non Interest Expense to Net Interest Income and noninterest income during the five year on average is 46.53 percent. The maximum spending ratio in the data set 193.27 percent which means the bank spend almost double from the income generated where as the minimum was 19.86 percent. This gap is also reflected on the

value of standard deviation of the management ratio i.e. 21.69 percent which is the highest variability than the other independent variables.

Earning calculated by the ratio of Net Interest Income to total loan and advance during the study period the mean earning of the commercial banks of Ethiopia is 6.66 percent. The maximum earning during the period was 10.01 percent and the minimum earning was 2.19 percent. There is low or no variation between the earning of the banks as it measured by standard deviation with the value 1.86.

The last Independent Variable is Liquidity this is measured by the ratio of total loan to total deposit. The mean value of the data set of liquidity is 56.36 percent. The maximum value in this data is 80.02 and the minimum value is 40.49. This reveals that on average 56.36 percent of commercial banks deposit is converted in to the loan and the remaining balance helps to maintain the liquidity position of the banks.

4.9 Correlation Analysis between Study Variables

In this section the correlation between profitability measures; return on asset and return on equity and explanatory variables; capital adequacy, asset quality, managerial efficiency, earning ability, and liquidity have been presented and analyzed.

4.9.1 Correlation Analysis between Return on Asset and Explanatory variables

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

Table 4. 9 Correlation matrix: ROA

	ROA	CA	AQ	MGT	EAR	LIQ
ROA	1					
CA	-0.24993	1				
AQ	0.134743	-0.28787	1			
MGT	-0.78231	0.586578	-0.16832	1		
EAR	0.165129	-0.1445	-0.23887	-0.2733	1	
LIQ	-0.00861	0.556146	0.070147	0.225496	0.00548	1

Source; E-Views Output

As it can be seen from table 4.9 the management efficiency ratio is the highest negatively correlated variable with return on asset. This correlation clearly shows that when the management ratio of the bank increase the return on asset decreases

Similarly the correlation coefficient of Return on asset with capital adequacy ratio and liquidity ratio is negative indicating that the profitability measure return on asset moves in opposite direction. On the contrary the return on asset has positive correlation with earnings ratio and asset quality ratio which means the two variables go in same direction with ROA.

4.9.2 Correlation Analysis between Return on Equity and Explanatory variables

Return on Equity (ROE), the net income per birr of equity capital, which is more concerned about how much the bank owners is earning on their equity investment. The correlation analysis was done between profitability measures; return on equity and explanatory variables; capital adequacy, asset quality, managerial efficiency, earning ability and liquidity

Table 4. 10 Correlation Matrix: ROE

	ROE	CA	AQ	MGT	EAR	LIQ
ROE	1					
CA	-0.77476	1				
AQ	0.214584	-0.28787	1			
MGT	-0.75664	0.586578	-0.16832	1		
EAR	0.280732	-0.1445	-0.23887	-0.2733	1	
LIQ	-0.39722	0.556146	0.070147	0.225496	-0.00548	1

Source; E-Views Output

As per the table 4.10 above, the correlation coefficient between return on equity and capital adequacy ratio is -0.77 which means the capital adequacy of the commercial banks has high negative relation with Return on equity. When the Capital adequacy ratio as measured by the ratio of total capital to total asset increases the return on equity ratio decreases and vice versa.

The Correlation coefficient between return on equity and asset quality of commercial banks is 0.21 it indicates that the increase in Asset quality will result in the increase the ratio of return on equity.

There is high negative Correlation between return on equity and management efficiency of commercial banks. Since the correlation coefficient is -0.76 it indicates that the increase in management efficiency will result in the decrease the ratio of return on equity and vice versa.

The correlation coefficient between return On equity and earnings ratio of the bank is 0.28 this shows there is a weak positive relation between the two variable where as the correlation coefficient between return on equity and liquidity ratio is -0.39 which indicate there is a low negative relation.

4.10 Test result for the Classical linear regression model Assumptions

In this study diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Consequently, the results for model misspecification tests are presented as follows

4.10.1 Tests for Hetroscedasticity

both the F-statistic and Chi-Square versions of the test statistic gave the same conclusion that there is no evidence for the presence of heteroscedasticity on both ROA and ROE, since the p-values were in excess of 0.05.

Table 4.11 Heteroskedasticity Test for ROA: White

F-statistic	1.682947	Prob. F(7,62)	0.1298
Obs*R-squared	11.17697	Prob. Chi-Square(7)	0.1311
Scaled explained SS	23.10393	Prob. Chi-Square(7)	0.0016

Table 4. 12 Heteroskedasticity Test for ROE: White

F-statistic	0.942779	Prob. F(7,62)	0.4806
Obs*R-squared	6.734191	Prob. Chi-Square(7)	0.4571
Scaled explained SS	9.355786	Prob. Chi-Square(7)	0.2281

4.10.2 Test for Autocorrelation

The Durbin-Watson test statistic value shown below for ROA and ROE was 2.291648 and 2.015750 respectively. As mentioned in the previous chapter to empirically analyze factors affecting bank profitability in Ethiopia 70 (14*5) observations were used in the model. Moreover, there were 5 regressors and an intercept term in the model. Therefore, the relevant critical values for the test are dL= 1.336, dU = 1.741, i.e., for 70 observations and 5 regressors and 4 - dU = 4-1.741=2.259; 4 - dL = 4-1.336=2.664. The Durbin-Watson test statistic of 2.291648 and 2.015750 is clearly between the upper limit (dU) which is 1.741 and the critical value of 4- dU i.e.2.259 and thus the null hypothesis of no autocorrelation is within the non- rejection region of the number line and thus there is no evidence for the presence of autocorrelation

The Durbuin Watson test statistic tests the null hypothesis that the residuals ordinary least –squares regression are not auto correlated against the alternative residuals. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-Autocorrelation; a value toward 0 indicates positive autocorrelation; a value toward 4 indicates negative autocorrelation.

Table 4.13 Durbin-Watson test results for the regression model

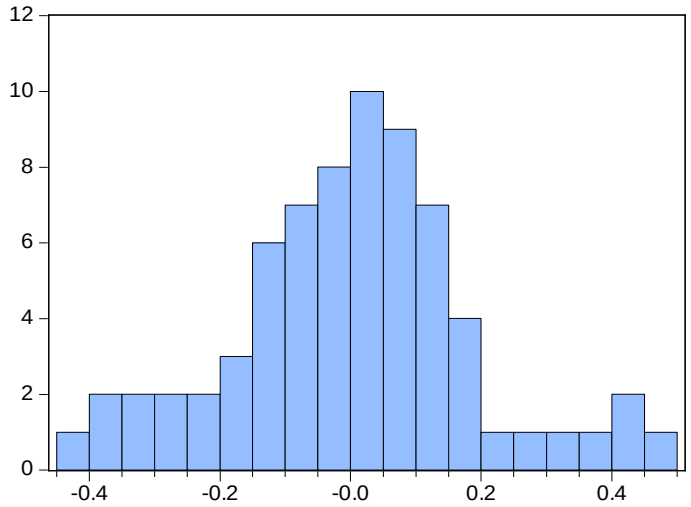
	Return on asset	Return on equity
Durbin-Watson test	2.291648	2.015750

4.10.3 Test for Normality

Test for normality require to check whether the disturbances are normally distributed or not. According to 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.

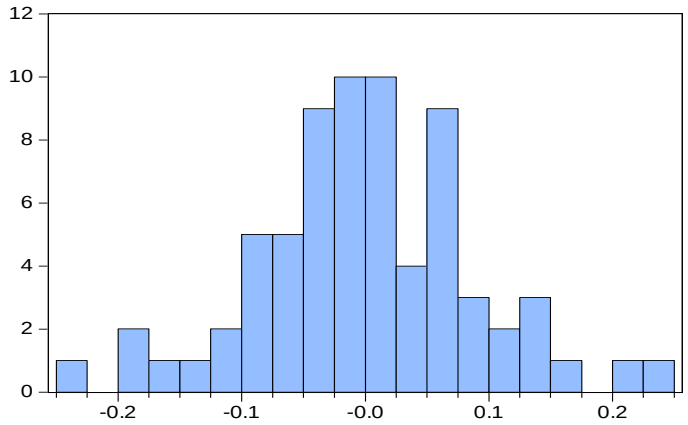
As you can see from the normality test result, the Jarque-Bera shows a probability of 0.88 for return on asset and a probability of 0.71 for return on equity.The result suggests that data used for the model constraction is normal i.e meets the property of normal distribution.

Table 4.14 Normality Test for residuals 0f Return on Asset



Series: Standardized Residuals	
Sample 2010 2014	
Observations 70	
Mean	-1.11e-17
Median	0.000934
Maximum	0.450197
Minimum	-0.415292
Std. Dev.	0.184066
Skewness	0.109439
Kurtosis	3.189517
Jarque-Bera	0.244488
Probability	0.884933

Table 4.15 Normality Test for residuals 0f Return on Equity



Series: Standardized Residuals	
Sample 2010 2014	
Observations 70	
Mean	3.17e-18
Median	-0.000964
Maximum	0.226470
Minimum	-0.235709
Std. Dev.	0.089317
Skewness	0.014624
Kurtosis	3.530178
Jarque-Bera	0.822337
Probability	0.662875

4.10.4 Test for Multicolliniearity

A correlation matrix used to ensure the correlation between explanatory variables. Cooper & Schindler (2009) suggested that a correlation coefficient above 0.8 between explanatory variables should be corrected for because it is a sign for multicolinearity problem. Mashotra (2007) argued that the correlation coefficient can be 0.75. Lastly, Hair *et al.* (2006) argued that correlation coefficient below 0.9 may not cause serious multicolliniarty problem.

Table 4.16 shows that all the correlation coefficient values are less than 0.9; suggesting that there is no problem of multicollinarity.

Table 4.16 Correlation Matrix: Explanatory Variables

	CA	AQ	MGT	EAR	LIQ
CA	1.000000				
AQ	-0.287867	1.000000			
MGT	0.586578	-0.168315	1.000000		
EAR	-0.144502	-0.238865	-0.273297	1.000000	
LIQ	0.556146	0.070147	0.225496	-0.005483	1.000000

Source; E-Views Output

4.11 Regression analysis between return on asset and explanatory variables

To examine the relationship between profitability measures and explanatory variables two regression analysis were run. The first regression analysis was undertaken to investigate the relationship between Return on asset and independent variable.

The regression Analysis result (Table 4.17) shows R-squared statistics and adjusted R squared statistics value of 96.62% and 95.25% respectively. The result indicates that the change in the independent variable explain 95.25% of the change in the dependent variable. That is capital Adequacy, Asset Quality, Management efficiency, Earning and liquidity collectively explains 95.25% of ROA.

The remaining 4.75% of change was explained by other factors which are not included in the model. Thus these five variables used in the CAMEL framework are good explanatory variables of ROA of the commercial Banks in Ethiopia. The null hypothesis of F- statistics (the Overall test of Significance) that R^2 is equal to zero was rejected at 1% as the p-value was sufficiently low value of 0.000000; suggesting a strong level of significance, which enhances the reliability and validity of the model.

$$ROA = 10.74 - 0.002CA - 0.06AQ - 2.83MGT + 0.06EAR + 0.63LIQ - -(1)$$

Table 4.17 Regression Analysis Result for Return on Asset (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.74245	1.299147	8.268848	0.0000
CA	-0.002330	0.014757	-0.157889	0.8752
AQ	-0.058360	0.019221	-3.036300	0.0038*
MGT	-2.833768	0.146223	-19.37971	0.0000*
EAR	0.062268	0.022680	2.745537	0.0084*
LIQ	0.625077	0.317533	1.968545	0.0547**

R-squared	0.966245	Durbin-Watson stat	2.291648
Adjusted R-squared	0.952467		
S.E. of regression	0.218424		
F-statistic	70.13080		
Prob(F-statistic)	0.000000		

*and ** denote significance at 1% and 5% levels respectively.
Source: E- view output

Based on the result of Table 4.17 the coffecent of Capital Adequacy,Asset quality and Management efficency againest ROA were negative -0.002,-0.058 and -2.834 respectively.This indicates that there was an inverse relationship between the aforementioned three independent variables and ROA and statsticaly significant for AQ and MGT.

On the other hand Earning and liquidity ratio had a positive relationship with ROA 0.062 and 0.625 respectively.This reveales that there is a direct relationship between the above independent variable and ROE and statisticaly significant.

4.12 Regression analysis between return on Equity and explanatory variables

The second regression analysis was done to know how much the bank is earning on their equity investment, an amount that is measured by the return on equity (ROE) in relation with explanatory variables included in this study.

$$ROE = 7.111 - 0.072CA - 0.004AQ - 1.192MGT + 0.038EAR + 0.289LIQ - -(2)$$

Table 4.18 Regression Result for Return on Equity

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.111270	0.607480	11.70617	0.0000
CA	-0.072494	0.009567	-7.577640	0.0000*
AQ	-0.004397	0.008905	-0.493777	0.6237
MGT	-1.191495	0.072154	-16.51322	0.0000*
EAR	0.037532	0.011013	3.408070	0.0013*
LIQ	0.288581	0.143597	2.009660	0.0500**

R-squared	0.991448	Durbin-Watson stat	2.015750
Adjusted R-squared	0.987957		
S.E. of regression	0.105989		
F-statistic	284.0307		
Prob(F-statistic)	0.000000		

*and ** denote significant at 1% and 5% levels respectively.

Source:-E-View output

As Table 4.18 shows you R-Squared statistics and adjusted R-squared statistics of the model is 99.14 and 98.80 percent respectively. This result indicates that change in independent variable explain 98.80 Percent of the change in the dependent variable that means capital adequacy ratio, asset quality ratio, management efficiency ratio, earning ratio and liquidity ratio in aggregate explain 98.80 percent of the change in ROE. This suggests that all the explanatory variables are collectively good in explaining return on equity.

The coefficient of capital adequacy, asset quality and management efficiency were negative that is -0.073,-0.004 and -1.192 respectively. This indicates that there was an inverse relationship between the aforementioned three variables and Return on equity. On the other hand the coefficient of earning ratio and liquidity ratio was positive that is 0.038 and 0.289 respectively. This means both variables have the effect of increasing return on equity. And statistically significant at 1% for CA, MGT and EAR while significant at 5% for LIQ. whereas asset quality ration is statistically in significant even at 10%.

CHAPTER FIVE

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

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.

5.1. Summary

The main objective of this study was to investigate the performance of commercial banks of Ethiopia based on CAMEL approach and rank the banks according to their performance as well as to investigate the relationship between CAMEL variables with profitability measure Return on Asset (ROA) or return on Equity (ROE). Specific objectives were to evaluate and rank the banks based on their performance using financial ratio selected from the CAMEL framework. Balanced panel data of seventy observations from 2010 to 2014 of fourteen commercial banks was analyzed using multiple linear regressions method. Only secondary data collected from audited and provisional financial statement of the banks was used to investigate the performance of commercial banks.

The major findings of the study are the following:

- CAMEL rating based on last five Years (2010-2014) average performance of commercial banks is as follows:
    - In terms of Capital adequacy as measured by the ratio of total capital to total asset Bunna International Bank is rated first i.e. with the average value of 24.15%. During the study period 14.26% of the commercial banks asset was financed by capital. Commercial Bank of Ethiopia maintained the last position with the average ratio of 5.39 Percent.
    - With regard to asset quality ratio as measured by the ratio of provision for loan loss to total loan again Buna International bank is the first with an average value of 1.1 % .During the study period the commercial

banks provide 2.77% for loan loss. With the average Value of 7.8% Business and Construction bank takes the last position among the banks.

- Management efficiency as measured by the ratio of Non interest expense to Net-interest income plus Non-Interest income Commercial Bank of Ethiopia is the first with the average ratio of 25.31% in average the commercial banks spend 46.44% of their income to cover Noninterest expense. With an average value of 78.40% Berhan International Bank maintained the last position among the banks..
- In terms of earning ratio as measured by Net Interest Income to total loan Commercial bank of Ethiopia stood on the top with the average ratio of 8.84 % while Zemen Bank was the last with the average ratio of 3.77%. The earnings ratio of the banks in Ethiopia was on average 6.65% during the study period.
- Liquidity ratio as measured by the ratio of total loan to total deposit Buna International Bank was the first with the average ratio of 70.10% while Commercial bank of Ethiopia was the last with the average ratio of 46.6%.The liquidity position of the commercial banks in Ethiopia was 56.36% on average.

According to the Composite rating of CAMEL, Wogagen Bank stood on the top followed by Bunna international bank.The Construction and Business Bank maintained the last position among commercial banks in Ethiopia. The Industry gaint Commercial Bank of Ethiopia maintained the Sixth position.

- Descriptive analysis result shows the capital adequacy mean value suggests 14% of the total asset of the commercial banks in Ethiopia were financed by shareholders contribution while the remaining 86% were financed from deposit. Asset quality ratio as measured by Provision for loan loss to total loan mean value was 2.75 Percent it indicates almost all banks Provide consistent provision to manage credit risk of the bank. Managerial efficiency ratio as measured by Non Interest Expense to Net Interest income plus Non Interest Income had mean value of 46.43 Percent which means most of commercial banks in

Ethiopian spends 46.43 percent of their revenue for operation expense management efficiency of the banks variation among the banks was high between the banks as revealed by standard deviation value. It is relatively high among the explanatory variable. Earnings ratio in our study measured by the net interest income to total loan and advance had the mean value of 6.65 Percent with the lowest standard deviation among other CAMEL factors of 1.86.This reflects Ethiopian commercial banks were applying consistent interest rate on the loan with few variation among banks. The Liquidity ratio was the final explanatory variable it was measured by total Loan to total deposit. During the study period the mean value was 56.36 Percent with the standard deviation of 8.05. This indicates 56.36 percent of the deposit of Ethiopian commercial banks converted in to loan and 44.66 percent of the deposit maintained in the bank to manage the liquidity risk with few variability among the banks.

- With regard to the relationship between the selected CAMEL model variable to profitability measures of Return on Asset (ROA) Capital adequacy ratio, asset quality ratio and management efficiency ratio had negative relation with the return on asset of the commercial banks and positive relation with Earning and liquidity ratio. This indicate that Capital adequacy, asset quality and management ratio had inverse relation with the ROA. Asset quality ratio, management efficiency ratio and earnings ratio was significant at 1% whereas liquidity ratio is significant at 5% . Capital Adequacy ratio was insignificant even at 10%.
- Asset Quality and management Efficiency ratio had negative relation with Return on Equity whereas there was a positive relationship with Earning ratio and Liquidity ratio. Capital Adequacy, Management efficiency and earnings ratio were significant at 1% and liquidity ratio is significant at 5% significance level. Asset quality ratio was insignificant even at 10% significant level.
- As to the explanatory power of the regression output 95.25 percent of the change in the return on asset can be explained by the selected CAMEL model variable while 98.80 percent of the change on the Return on Equity.

5.2 Conclusion

CAMEL rating model plays a crucial role in the supervisory process and in identifying Problematic Banks. The finding of the CAMEL model rating revels that the banks under the study had different ranking on the CAMEL model. This is because mainly due to bank specific related factors and different business experience in the Banking industry. For example new bank had better Capital adequacy position relative to the old banks.

The Empirical CAMEL model findings regarding the elements of the model and profitability as measured by ROA and ROE suggest the following:

- The relationship between capital adequacy Ratio and Profitability is negative. As to the level of significance the result shows capital adequacy ratio is insignificant for ROA even at 10% significant level while it was significant for ROE at 1% significant level.
- The relationship between Asset quality ratio and profitability is negative and with 1% significance level statistically significant for ROA whereas insignificant level ROE.
- As to the relationship between Management efficiency ratio and profitability is negative and statistically significant at 1% significance level. In addition to this the coefficient of the variable was relatively high for both profitability measures.
- The result showed Positive relationship between Earning ratio and Profitability with strong statically significance.
- The result showed positive relationship between Liquidity ratio and profitability. The result shows liquidity ratio was statically significant at 5% significant level.

5.3 Recommendation

Based on the findings of the study the following recommendations were forwarded.

The study revealed asset quality ratio, Management efficiency, Earning ability and liquidity are the key driver of return on asset of commercial banks in Ethiopia similarly the study also identified capital strength, management efficiency ,earning ability and Liquidity as the key drivers of return on equity of Ethiopian Commercial banks.

Therefore, Bank managers are advised to give due attention to those variables to improve profitability.

The current study uses only some representative financial ratios from factors of the CAMEL model, the financial ratios included in the research may not exhaustive and enough to evaluate the bank's Capital adequacy, asset quality, earning ability and liquidity. Therefore future researcher is recommended to consider additional financial ratios.

The CAMEL model is useful rating tools for banking sectors, However, the tool can be equally be applicable to other related financial institution Like Micro Finance Institution and Insurance Companies. Thus, future research is recommended to use the CAMEL model for such kind of institution.

Furthermore bank performance is now a day's seen from the perspective of economic value added (EVA) in addition to the usual ROA and ROE measures. The CAMEL model has also the sixth dimension referred as sensitivity to the market. Therefore, future research would make relevant contribution if it considers those two developments into the research the model i.e. EVA to measure bank performance and sensitivity to the market as the sixth dimension of the CAMEL model.

The current study fully employed secondary data and the analysis was fully based on financial data. However, secondary data obtained from financial reports of banks or through National Bank can have potential bias. Thus, future research is recommended to substantiate and/or triangulate secondary data by primary data such as interviewing.

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Annex 1 List of Commercial Bank Operated In Ethiopia

No	Bank Name	Establishment Year
1	Commercial Bank Of Ethiopia	1974
2	Construction and Business Bank	1974
3	Awash International Bank	1994
4	Dashen Bank	1995
5	Abyssinia Bank	1996
6	Wogagen Bank	1997
7	United Bank	1998
8	Nib International Bank	1999
9	Cooperative Bank of Oromia	2004
10	Lion International Bank	2006
11	Oromia International Bank	2008
12	Zemen Bank	2008
13	Bunna International Bank	2009
14	Birhan International Bank	2009
15	Abay Bank	2010
16	Addis International Bank	2011
17	Debub Global Bank	2012
18	Enat Bank	2012

Source: www.nbe.gov.et

Annex 2 Regression Result of ROA

Dependent Variable: ROA
Method: Panel Least Squares
Date: 05/28/15 Time: 05:33
Sample: 2010 2014
Periods included: 5
Cross-sections included: 14
Total panel (balanced) observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.74245	1.299147	8.268848	0.0000
CA	-0.002330	0.014757	-0.157889	0.8752
AQ	-0.058360	0.019221	-3.036300	0.0038
MGT	-2.833768	0.146223	-19.37971	0.0000
EAR	0.062268	0.022680	2.745537	0.0084
LIQ	0.625077	0.317533	1.968545	0.0547
DUMROA1014	1.391637	0.275026	5.060012	0.0000
DUMROA1112	-1.129996	0.263813	-4.283320	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.966245	Mean dependent var	2.776796
Adjusted R-squared	0.952467	S.D. dependent var	1.001849
S.E. of regression	0.218424	Akaike info criterion	0.038570
Sum squared resid	2.337748	Schwarz criterion	0.713118
Log likelihood	19.65005	Hannan-Quinn criter.	0.306509
F-statistic	70.13080	Durbin-Watson stat	2.291648
Prob(F-statistic)	0.000000		

Annex 3 Regression Result of ROE

Dependent Variable: ROE
Method: Panel Least Squares
Date: 05/28/15 Time: 05:29
Sample: 2010 2014
Periods included: 5
Cross-sections included: 14
Total panel (balanced) observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.111270	0.607480	11.70617	0.0000
CA	-0.072494	0.009567	-7.577640	0.0000
AQ	-0.004397	0.008905	-0.493777	0.6237
MGT	-1.191495	0.072154	-16.51322	0.0000
EAR	0.037532	0.011013	3.408070	0.0013
LIQ	0.288581	0.143597	2.009660	0.0500
DUMROE1310	-3.957042	0.185103	-21.37748	0.0000
DUMROE1311	0.531750	0.158500	3.354881	0.0015

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.991448	Mean dependent var	2.926365
Adjusted R-squared	0.987957	S.D. dependent var	0.965825
S.E. of regression	0.105989	Akaike info criterion	-1.407640
Sum squared resid	0.550449	Schwarz criterion	-0.733091
Log likelihood	70.26739	Hannan-Quinn criter.	-1.139701
F-statistic	284.0307	Durbin-Watson stat	2.015750
Prob(F-statistic)	0.000000		

Annex 4 Ratio Data

obs	ROA	Log(roe)	CA	AQ	Log(mgt)	EAR	Log(Liq)
CBE 2010	2.65	3.57	7.49	1.85	3.22	8.32	3.783
CBE2011	2.51	3.82	5.48	2.45	3.33	8.24	3.748
CBE2012	3.42	4.25	4.86	2.21	2.99	8.07	3.979
CBE2013	3.1	4.21	4.59	2.61	3.18	10.01	3.849
CBE2014	2.74	4.10	4.54	2.68	3.39	9.55	3.833
CBB2010	2.90	3.35	10.13	10.91	3.59	5.73	4.308
CBB2011	2.45	3.16	10.36	10.48	3.79	5.33	4.232
CBB2012	1.93	3.18	8.05	9.70	3.87	4.6	3.937
CBB2013	2.08	3.04	9.93	4.38	3.88	5.04	3.870
CBB2014	1.24	2.58	9.37	3.52	4.26	5.09	3.863
DB2010	2.62	3.36	9.09	2.18	3.58	4.64	3.907
DB2011	3.07	3.47	9.53	1.99	3.53	4.48	3.961
DB2012	3.72	3.57	10.43	2.15	3.47	6	4.056
DB2013	3.07	3.39	10.36	2.25	3.66	5.99	4.024
DB2014	3.25	3.31	11.83	1.85	3.67	5.91	3.995
AIB2010	3.12	3.27	11.84	4.71	3.53	4.72	3.942
AIB2011	3.57	3.32	12.93	3.64	3.39	4.65	3.941
AIB2012	3.30	3.20	13.49	2.70	3.58	6.97	4.091
AIB2013	3.42	3.23	13.54	2.30	3.74	6.84	4.118
AIB2014	2.80	3.17	11.75	2.27	3.75	8.09	4.111
BOA2010	2.24	3.18	9.32	7.41	3.75	4.27	4.117
BOA2011	2.49	3.31	9.08	3.33	3.76	6.28	4.000
BOA2012	2.63	3.17	11.00	2.57	3.78	7.42	4.053
BOA2013	2.71	3.21	10.93	1.99	3.74	6.93	4.014
BOA2014	2.44	2.89	13.56	1.79	3.90	8.11	4.037
WB2010	3.89	3.06	18.32	3.97	3.56	6.93	4.144
WB2011	4.01	3.19	16.59	4.54	3.58	7.38	3.889
WB2012	4.03	3.04	19.22	2.43	3.57	8.46	4.126
WB2013	3.30	2.93	17.61	2.24	3.73	8.81	4.129
WB2014	2.76	2.70	18.60	1.67	3.93	9.32	4.006
UB2010	2.96	3.31	10.81	3.65	3.66	5.61	4.013
UB2011	3.00	3.25	11.67	2.77	3.51	5.92	3.989
UB2012	3.39	3.30	12.54	2.33	3.58	7.83	4.102
UB2013	2.14	2.88	12.04	1.86	3.98	7.52	4.068
UB2014	2.34	2.87	13.26	1.44	3.97	8.64	3.988
NIB2010	3.36	3.09	15.35	3.90	3.66	6.93	4.122
NIB2011	3.47	3.05	16.46	4.12	3.58	7.72	3.982
NIB2012	3.46	2.93	18.46	2.71	3.58	7.6	4.151

NIB2013	3.12	2.84	18.22	2.50	3.77	8.49	4.223
NIB2014	2.91	2.77	18.28	2.10	3.89	8.4	4.245
LIB2010	2.93	2.80	17.73	1.62	3.81	6.37	4.050
LIB2011	2.42	2.52	19.52	1.45	3.82	7.3	3.954
LIB2012	3.06	2.84	17.93	1.55	3.73	7.91	4.023
LIB2013	3.79	3.02	18.42	1.30	3.63	8.7	4.137
LIB2014	2.68	2.74	17.38	1.34	3.96	8.76	4.063
CBO2010	1.42	2.59	10.69	2.53	4.16	6.59	3.963
CBO2011	1.89	2.96	9.83	2.00	3.99	6.47	3.701
CBO2012	2.78	3.20	11.37	1.44	3.76	8.15	3.901
CBO2013	2.89	3.30	10.64	1.72	3.77	8.08	3.858
CBO2014	4.67	3.45	14.83	1.83	3.67	8.65	4.221
ZB2010	4.83	3.47	15.02	1.56	3.63	2.19	4.022
ZB2011	5.25	3.56	14.92	1.78	3.45	3.03	4.016
ZB2012	3.61	3.43	11.72	1.79	3.65	3.62	4.034
ZB2013	2.90	2.95	15.19	8.52	4.08	3.62	4.001
ZB2014	4.69	3.33	16.73	8.83	3.56	6.36	3.854
OIB2010	1.72	2.20	18.95	1.14	4.20	4.11	3.805
OIB2011	2.27	2.71	15.09	1.06	3.97	4.46	3.769
OIB2012	1.78	2.43	15.70	1.29	4.14	6.57	3.874
OIB2013	2.00	2.66	14.00	1.46	4.13	8.15	3.973
OIB2014	2.49	3.02	12.16	1.33	3.99	8.81	3.937
BUIB2010	0.01	-3.52	35.22	1.01	4.60	3.4	4.382
BUIB2011	2.49	2.13	29.76	1.13	4.02	5.73	4.311
BUIB2012	2.04	2.27	21.03	1.12	4.01	6.1	4.279
BUIB2013	2.17	2.51	17.59	1.16	3.89	8.56	4.117
BUIB2014	2.65	2.74	17.16	1.10	4.01	9.32	4.134
BIB2010	-1.58	0.00	26.97	1.00	5.26	2.62	4.165
BIB2011	2.32	2.65	16.41	1.12	3.86	4.94	3.867
BIB2012	2.62	2.66	18.38	1.17	3.75	5.92	3.982
BIB2013	2.41	2.63	17.36	1.52	3.88	4.89	4.118
BIB2014	1.60	2.09	19.71	1.63	4.09	9.05	4.076