



**THE IMPACT OF INDUSTRY CONCENTRATION ON PERFORMANCE,
EXPLORING A
COMPREHENSIVE BANK PERFORMANCE MODEL:
THE CASE OF THE ETHIOPIAN BANKING SECTOR**

BY

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DECLARATION

I declare that this PhD thesis is my own work and that all the sources I indicated and acknowledged are very well referenced. It has also not been submitted before for any degree or examination in any other university.

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Abstract

There are wide empirical studies and literatures that advocate for a strong link between financial sector development and economy growth. Nevertheless, similar to the situation in Sub-Saharan Africa, the share of the financial sector in the overall economy of Ethiopia is at lower level and can be referred as a shallow financial market. In Ethiopia, reform measures to enhance the performance of this sector through liberalization measures as well as economic plans, Growth and Transformation Plan I & II (GTP I& II) that set bank growth strategies were enacted in an attempt to augment their contribution to the economy. Despite such reforms and policy attentions the banking system in Ethiopia is characterized by high concentration with an observed dominance of the state owned banks. Nonetheless, the lack of indisputably conclusive and substantial disagreement in empirical results, the Structure- Conduct- Performance (SCP) theorists claim that such kind of industry structure influences the conduct and performance of firms. The basic objective of this research is to test the validity of this view. A SCP analysis has been undertaken so as to examine whether the level of concentration influences performance of Ethiopian Banks. In addition, it aims at investigating the impact of other non-structure factors on performances with an overarching purpose of exploring a comprehensive model of bank performances. The study employed an explanatory sequential mixed method approach that combined both quantitative and qualitative studies to explore the central and subsidiary questions. A quantitative approach is adopted to form a causal link among different variables with bank performance measures. A panel data set from 1999 to 2015 for all (eighteen) commercial banks is used for the quantitative study. The quantitative study employs a two-stage estimation procedure to evaluate the impact of bank concentration on performance. In the first stage of the estimation process, a Data Envelopment Analysis (DEA) is employed to produce an efficiency estimates. The output of the DEA is later used as an input in the second stage of the estimation procedure, where a panel data regression model was employed to investigate the relationship between efficiency, concentration and other factors on profit and price performances. A qualitative approach that gathers data through semi-structured interviews with bank managers and regulatory staff is also used to justify the established relationship in the quantitative study as well as investigate the conduct of banks under given industry structure and banking environment. The result of the integrated approaches rejects the structure performance hypothesis and supports the scale efficiency version of the efficiency hypothesis. Therefore, better bank performance is derived from efficient operation rather than from collusive power of the banks in the industry. Theoretically as well it finds that bank collusion is not an easily pursued strategy among banks as long as there is a sizeable difference in bank size and ownership structure. Besides, there is a notable variation in their mission guiding their business motive. The test for efficiency variation through both parametric and non-parametric tests confirms that there is widely noted efficiency variation among banks operating in the country of which the state owned banks are consistently on the top of the frontier. The quantitative study whose result witnessed a different behavior of banks than the one suggested by the SCP hypotheses also finds that bank conduct is not necessarily a derivate of the industry structure and is shaped by several factors from internal and external environment. Most importantly, regulation is found to have a significant role in shaping the behavior of banks in the market. The

study also finds that bank specific external and regulatory factors also explain the variation in performance of banks. Variables like ensuring income diversification, building resilient capital and liquidity base, maintaining asset quality, narrowing trade deficit, ensuring market and economy growth among others remained pertinent policy variables that impact bank performances. A separate view on the policy direction under the GTP II shows a mixed result where requirements for branch /agents growth and bill purchases have negative effect on performance while others like loan growth, deposit growth, capital increase and asset quality control have positive implications. With the backdrop of such findings, the study recommends that bank regulators and policy makers should have considerations to the multi-variables in the model in their attempt to design regulatory directives and macroeconomic policies intended to improve bank performance. In addition, the regulatory organ should limit measures that aggravate the concentration of the sector. The recently introduced actions such as merger between state-owned banks need to be carefully considered as it potentially affects the performances of other banks in the system. Banks and regulatory moves should be directed towards improving bank efficiencies and regulatory rigidities in some fronts like bill purchases and branch growth requirements need to be flexed. The study extends the research on industry concentration and performance employing the structural models: (SCP) or Efficiency Hypothesis (ESH), and applying a direct measure of efficiency with extensive panel data set to examine the Ethiopian banking system. Contributing to theory, the study showed how the non-structure factors results in banks to behave in different way and sometimes in different way than the one presumed by the structural theorists. Hence, it rejects the approach to determine the conduct of banks solely from the industry structure as it could lead to wrong generalization. The study has introduced valuable but neglected factors from the previous structure- performance researches. For instance, it has examined the effect of regulation on bank performances and finds that regulatory factors are more powerful influencers of market structure, banks conduct and internal management decisions. Besides, the above stated theoretical contributions, the study makes an addition to the development of mixed methods research in the study of industry concentration through integrating quantitative and qualitative approaches to investigate a research question. The modified performance model developed in the study contributes to forthcoming research works related to industry structure, efficiency and bank performance.

Key words

Structure, conduct, performance, bank, efficiency, regulation, concentration, DEA

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List of Acronyms

ABAY	Abay International Bank S.C.
ADB	African Development Bank
ADDIS	Addis International Bank S.C.
AE	Allocative Efficiency
AIB	Awash International Bank S.C.
ANOVA	Analysis of Variance
ATM	Automatic Teller Machine
BIRHAN	Birhan International Bank S.C.
BOA	Bank of Abyssinia S.C.
BCC	Banker, Charnes and Cooper Model (Variable Return to Scale)
BRG	Branch Growth Rate
BUNNA	Bunna International Bank S.C.
CAMEL	Capital Adequacy, Asset Quality, Management, Earning and Liquidity
CAR	Capital Adequacy Ratio
CBB	Construction and Business Bank
CBE	Commercial Bank of Ethiopia
CBO	Cooperative Bank of Oromia S.C
CCR	Charnes, Cooper and Rhodes Model (Constant Return to Scale)
COIN	Cost to Income
CR	Concentration Ratio
CRQ	Central Research Question
CRS	Constant Return to Scale
CSA	Central Statistical Authority
DB	Dashen Bank S.C.
DBE	Development Bank of Ethiopia
DDTD	Demand Deposit to Total Deposit
DEA	Data Envelopment Analysis
DGB	Dejub Global Bank S.C
DMUs	Decision Making Units
DRS	Decreasing Returns to Scale
DUM	Dummy Variable
EE	Economic Efficiency
EEA	Ethiopian Economic Association
ENAT	Enat Bank S.C.
ESH	Efficient Hypothesis
ESS	Efficient Scale Hypothesis
ESX	Managerial(x-) Efficiency
ETB	Ethiopian Birr
EXCR	Exchange Rate
GDP	Growth Domestic Product
GTP	Growth and Transformation Plan
HHI	Herfindahl-Hirschman Index

HHIDP	Herfindahl Hirshman Index in the Deposit Market
HHILN	Herfindahl Hirshman Index in the Loan Market
IAS	International Accounting Standard
IMF	International Monetary Fund
IO	International Organization
IRS	Increasing Return to Scale
LIB	Lion International Bank S.C.
LM	Lagrange Multiplier
LNTA	Loan to Total Asset
MOFED	Ministry of Finance and Economic Development
MS	Market Share
NBE	National Bank of Ethiopia
NEIO	New Empirical Industrial Organization
NIB	Nib International Bank S.C.
NIM	Net Interest Margin
OIB	Oromia International Bank S.C
OLS	Ordinary Least Square
PR	Panzar and Rosse Model
RGDP	Real Gross Domestic Product
RMP	Relative Market Power Hypothesis
RoA	Return on Asset
RoE	Return on Equity
RTS	Return to SCALE
SCP	Structure Conduct Performance
SEFF	Scale Efficiency
TE	Technical Efficiency
TRDB	Trade Balance
TRDFF	Trade Deficit
UB	United Bank S.C.
UNISA	University of South Africa
USD	United States Dollar
VIF	Variance Inflation Factor
VRS	Variable Return to SCALE
WB	Wegagen Bank S.C.
ZB	Zemen Bank S.C.

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE INDUSTRY

1.1. Introduction

Since the onset of the market oriented economy in 1990s, Ethiopia has made a series of policy reform measures and deregulations pervading all aspects of the economy (Geda, 2006). A recovery in the overall economic performance has been registered as measured by GDP and real GDP per capita. Over the past decade, the country has recorded double-digit economic growth rate (averaging at 11% annually) and is rated one of the fastest growing non-oil exporting economy in the world (MOFED, 2015).

The source of this overall economic growth is mainly attributed to the growth in the agriculture and service sectors (NBE Report, 2015). The service sector which accounts for 45% of Ethiopia's GDP has been a major driver of economic growth, posting annual average growth rates of about 14% since 2006/7. The growth in the service sector mainly emanated from the expansion of hotels and restaurants, real estate and housing, transport and communication, banking and insurance as well as trading activities. Nevertheless, alike the situation in Sub-Saharan Africa, the share of the financial sector in the overall economy of Ethiopia is at lower level and can be referred as a shallow financial market (IMF, 2007). The contribution of the financial sector from the total services and the GDP stood at 7% and 2.6% with average growth rate not exceeding 1% per annum (MOFED, 2014).

Despite the low development of financial market in Ethiopia, literature, however, advocates a strong link between financial sector development and economic growth. Countries with better functioning financial institutions and markets grow faster (Levine, 2005). In Ethiopia as well, considering its notable contribution to economic growth, the financial sector has got government attention for more structural transformation. For instance, reform measures to spur the performance of this sector through liberalization measures were enacted and have been implemented since 1991 (Geda, 2006). As

literature suggested, it is expected that the liberalization measures can contribute to enhance deepening of the financial sector and ensuring efficient allocation of resources (McKinnon 1973; Shaw 1973). In addition, the recent economic plan of the country, Growth and Transformation Plan II (GTP II) has set bank growth strategies in an attempt to augment their contribution to the economy.

The Banking sector appears to be the major player in the Ethiopian financial market holding more than 95% of the gross financial asset (NBE report, 2013). This sector has been victim of different economic system which was influencing its institutional set-up (Harvey,1996). For instance, the banking system was highly repressed during the command economic system. This has resulted in an institutional framework with a situation of virtually no competition and with total concentration of banking activities in government owned banks. Nevertheless, after the change of the government, a range of reform measures which changed the ownership, the regulatory framework the structure and performance of the banking system were introduced (Lelissa, 2007). Despite the changes, currently the Ethiopian banking industry is highly protected from outside competition through ban of foreign bank entry and the entrance of new local private banks into the market was very restricted (Bezabih and Desta, 2014). Since the 1991 measure, there appears a growth in the number of banks (NBE, 2016). But the competition remained insignificant because of the very limited but growing share of new private banks in the banking market and performance (Lera and Rao, 2016). In other words, the banking industry exhibited a high concentration level which might have an effect in both efficiency and performance of banks as presumed in the Structure-conduct-Performance paradigm (Bain, 1951). On the other front, as suggested by Lipczynski et.al (2013) certain variables (regarding regulation like ban of foreign banks, entry capital increase etc.) also have a significant impact on the market concentration level and affect the performance and efficiency of banks. Therefore, besides high concentration, tight regulations also have influence on the performance of the banking system via facilitating market collusion or concentration.

The effect of industry structure on performance is one of the heated debates in the literature (Kapunda and Molosiwa, 2012). The traditional structure – conduct - performance (SCP) hypothesis is used in the literature to analyze firm performance given the structure of the market. The SCP or collusion hypothesis follows the eminent works of Bain (1951) which postulates that market structure influences conduct of firms through prices or investment policies and this in turn translates into performance (Yeet. et.al; 2012). This hypothesis asserts that the setting of prices that are less favorable to consumers (lower deposit rates and higher loan rates) in more concentrated market enable them to enjoy high profitable performance (Berger, 1995).

On the other hand, the traditional hypothesis was challenged by various theories such as the efficient market hypothesis which claims that market concentration is not a random event but rather the result of the superior efficiency of the leading firms (Demsetze, 1973). On top of the effect of the aforesaid factors such as concentration, efficiency and regulation, the performance of commercial banks can also be affected by various internal and external factors (Flamini et.el., 2009). On the good front, the Ethiopian financial sector has not exhibited bank crisis. However, there appears to be various policy measures that have implications on the performance of banks. Thus, to take precautionary measures, it deserves to be cognizant of the fact that there is dire need to understand the performance of banks and the effect of various factors affecting their performances. Moreover, there are only a handful of studies which comprehensively analyzed the effects of market structure, efficiency, regulation, internal and external factors on the performance of the Ethiopian banking sector.

This study, therefore, systematically identifies and measures the effects of concentration, efficiency, regulation, internal and external factors on the performance of the Ethiopian banking sector using panel data from 1990-2015 and 18 commercial banks.

1.2. Background of the Industry (the Structure of the Ethiopian Banking Sector)

The latest legal framework of the banking system was set in the banking proclamation of 1994. The proclamation seemed to have limiting conditions with regard to entry which can be considered as the main contributor to the concentration of the banking services among a few banks. For example, it is clearly stated in the Licensing and Supervisions of Banking Proclamation No. 84/1994 that no foreign national shall undertake banking business in Ethiopia. In addition, the minimum capital required to establish a new bank was raised from Birr 10 million in 1994 to birr 75 million in 1999 and to Birr 500 million in 2011. It can be argued that although these directives and proclamations are enacted to strengthen the capacity of existing banks, they have seemingly become a barrier as to why the number of operating banks did not flourish in the banking system of the country. For instance, from 1996-1999 five new private banks were operational in the country while after 2000 only two banks joined the banking system. The entry of banks in to the market after the recent capital revision is nil (NBE report, 2016). Therefore, the Ethiopian banking industry doesn't seem free from barriers to entry conditions that potential could impact the concentration and efficiency level of the banks. Nevertheless, the increase in paid up capital that contributes to the strengthening of the capacity of existing commercial banks has not brought a fast decline in the market power of the Commercial Bank of Ethiopia (Bezabeh and Desta, 2014). Therefore, further assessments as well as measures are required to redistribute the market share to other private and public owned banks so as to facilitate competition.

The current banking system of Ethiopia is highly regulated and protected from foreign competition. The banking activity is entirely owned by domestic banks and two forms of ownership structures are prevalent, that is, either banks are fully owned by private owners or else banks are fully owned by government (NBE report, 2016). In terms of market share, the commercial banking sector is still under the dominance of state owned banks. The number of state owned commercial banks is few, nonetheless, they control more than 70% of the total assets of the entire banking system (NBE report, 2016). Although the state owned banks dominated and are still dominating the market,

they do appear to have been facing a competitive environment since the issuance of the banking act allowed the participation of private banks in the industry (Deribie, 2012). However, the competition level might not be significant as the new banks generally have a relatively small market share (Lelissa, 2007). The share of private banks in the asset base is limited to 30%. In addition, the persistent presence of entry barriers even after the financial liberalization has weakened the competition among the domestic banks (Bezabeh and Desta, 2014). The banking system is still characterized by high regulation and control for a number of reasons. Some of the reasons include protecting depositors' fund, ensuring safety and stability of the banking system, protecting safety of banks by limiting credit to a single borrower and limiting or encouraging a particular kind of lending because of expected impact on the economy (Semu, 2010). In addition, policy measures from the government interfere in the decision making process of private commercial banks which might have implication on efficiency and performance. For instance, Ethiopian private banks are required to allocate 27 per cent of their new lending to the government with an interest rate of just 3 per cent (NBE Directive No.MFA / NBE BILLS / 001 / 2011).

With regard to regulation, the banking sector is regulated by the central bank, the National Bank of Ethiopia, with the aim of ensuring the health of the financial sector and improving the efficiency of service provision. The Licensing of Banking and Supervision of Banks and Insurance Companies Proclamation (No. 84/1994) empowered the Central Bank to supervise financial institutions. In tandem with such institutional arrangement, the central bank has issued sequence of policy measures which include interest and exchange rate reforms among others were undertaken. The first stride was the lifting up of nominal deposit interest rate. For instance, the average nominal deposit rate of banks for all types of deposits picked up from 5.9 percent in 1991/92 to a range of 6.3-10.9 per cent until 2001. This has led to a positive real deposit rate. However, after the first year of the floor for saving deposit rate was set at 3.0 percent in 2002 up until 2005. Again, the floor for saving and fixed time deposit is revisited subsequently to 4% and 5%, respectively. This has resulted in a negative real deposit interest rate record triggered by the increasing inflationary pressure.

With regard to lending rate, it was decontrolled and left to be determined by the banks themselves as late as January 1998 as compared to October 1992 when the bias between public and private charging of deposit rate was abolished. In all the reform period, a positive lending interest rate was recorded except in 2002/03 which was markedly known as severe draught year. Furthermore, in most of the years during the period 2006/07- 2010/11, where the country was in hyper inflationary situation, the real lending rate appears negative.

The sector liberalization was also strengthened by reform on financial instruments which includes devaluation of exchange rate, introduction of treasury bills, inter-bank foreign exchange market and others (NBE report, 2013). Despite the reforms introduced in the sector, the banking system still remains undiversified pervading a structure which unlikely encourages competition. Therefore, ways of increasing competition among the existing banks base on the prevailing structure should be underscored.

Currently, with the initiation of the financial sector reform, the commercial banking ecosystem consists of a total of nineteen banks, out of which three are public and sixteen are privately owned banks. As a result, the number of bank branches picked up from the level as low as 203 in June 1991 to 1,724 in June 2013 indicating significant expansion of banking activities (NBE report, 2013). The private owned banks share in branch networks is 49% and significant share of branch network belong to the public banks.

Total deposits mobilized by the banking sector during 2015/16 reached to Birr 435.55 billion, about 66.23% was mobilized by public banks while the remaining balance 33.77% was collected by private banks. Regarding deposit market share, public banks accounts for 68.2% of the total deposit market share of which CBE accounts for 66.4%. Small banks represent 10.36% of the total deposit market. The number of private banks which holds market share below 1% appear to be significant, i.e. (DGB, Addis, Enat, Berhan, Bunna, Abay, Lion, Zemen, OIB, and CBO Banks) hold 0.17%, 0.27%, 0.37%, 0.70%, 0.74%, 0.87%, and 0.92%, respectively). The deposit structure of commercial

banks depicts that demand, saving and time deposits accounts for 45.2%, 48.6% and 61.2%, respectively, as of June 30, 2016. This is in contrast to the 60% demand deposit share of the CBE that allowed it to exceptionally benefit from the high share of the low cost types of deposits.

The market share of private banks in the total outstanding loans and advances is 36.8% i.e. Birr 232.11 Billion as of 2015/16. In contrast, the share of public owned banks remained significant, i.e. 63.2% of which CBE holds 61.5% of the industry's loans and advances. The total NBE bills purchased by private banks stood 26.1 Billion Birr as of June 2014 which is 45% of the total loans and advances.

Profitability indicators shows that the average earning per share, average return on asset, average return on equity, and average profit per branch of private banks are 30%, 3% 18% and Birr 4.93 million, respectively in year 2015/16. The profitability of CBE almost matches with the profitability level of the industry gaining around 70% of the industry profit. Hence, the introduction of new private banks into the banking industry does not seem to affect the profitability of the leading bank.

In sum, CBE continued to be a single industrial giant accounting for 63% of net loans, 65% of deposits and 39% of capital in the banking system. Public banks (CBE and CBB) account for 65% of loans, 67% of deposits and 41% of capital in the sector. In such regard, the aggregate share of the public banks appears reasonable to explain the dominance of public banks in the sector. This is for the reason that the two state owned banks were sharing the same management at the top for long period, the Public Financial Institutions Supervisory Agency. Hence, such act seems to reflect the government stance to avoid/ minimize/ the extent of competition between the public commercial banks. Recently, however, the government has merged the two state owned commercial banks further exacerbating the level of market concentration in the industry.

1.3. Problem Statement

Given the prominent role of the banking industry to economic growth, the performance of banks remain to be a critical concern for various stakeholders including customers, bankers, regulators, shareholders among others. This is due to the fact that they are the predominant financial institutions in most developing countries and in Ethiopia which comprise over 90 percent of the financial system. The market structure of the banking system in Ethiopia still sustained with the dominance of the state owned bank, the Commercial Bank of Ethiopia, in all areas of the banking market (NBE, 2014). In such kind of market structure, a concentrated industry, increases collusive behavior which leads to higher prices and greater than normal profits to the leading firms (Bain, 1968). In addition, industry concentration appears to be one of several factors affecting bank performances and the economy. For instance, Kpodar (2005) finds that the weak relationship between finance and growth in Africa is partially due to concentration in the banking industries. Similarly Guzman (2000) confirms the negative effect of market power in a general equilibrium model of capital accumulation. He explored that a banking monopoly is more likely to result in credit rationing and leads to a lower capital accumulation rate.

The impact of concentration in the performance of the banking industry has emerged as an important but debatable area of research. The empirical divergence between SCP and competing hypothesis is still not conclusive and is attracting a lot of research works across the world and recently in Africa (Kapunda and Molosiwa, 2012). The SCP model is also criticized for lack of a comprehensive and multifaceted performance measurement and determinants. For instance, the SCP assumes conduct to be derived from market structure (Bain 1958) and other factors that have a bearing on bank performances (from macroeconomic, industry and bank specific) are not comprehensively incorporated in the SCP model. Specifically, the effect of regulation on performance is not widely assessed in empirical studies employing the SCP model. For instance, previous studies (Gilbert 1984) and studies in Africa (Classesns and Laeven,

2004) do not account for the regulatory and institutional factors that are likely to shape competition.

1.4. Research Questions

The research explores the following central and sub-research questions:

Central Research Question (CRQ): How does industry concentration influence the performance of banks in Ethiopia?

The sub-questions that the research investigates include:

1. Research Question (RQ)1: : how does bank efficiency affect bank performance in Ethiopia?
2. RQ2: Is there efficiency variation among banks operating in Ethiopia?
3. RQ3: How do bank specific factors relate to bank performance?
4. RQ4: How do external (sector and macroeconomic) factors relate to bank performance?
5. RQ5: What is the impact of regulation on bank performances?
6. RQ6: How do banks respond to the prevailing market structure (bank conduct)?

1.5. Objectives of the Study

1.5.1. General Objective

The general objective of the research is to empirically examine the impact of industry concentration on the performance of banks. This study is, therefore, intended to enrich the debate on the industry structure and performance relationship in hindsight that financial sector development is instrumental to economy growth.

1.5.2. Specific Objectives

As subsidiary to the general objective, the research aims to:

- I. to explore the effect of efficiency on the performance of banks and evaluate the efficiency level and variation among Ethiopian banks;
- II. investigate the effect of bank specific (situations under the control of the management) on bank performance
- III. examine the impact of external (sector specific and macroeconomic) factors on bank performance;
- IV. evaluate the effect of regulations on the performance of banks.
- V. test the conduct of the Ethiopian banks given the existing industry structure, regulatory framework, internal and external factors and evaluate the findings with the one suggested in the SCP hypothesis.
- VI. develop a comprehensive model to assess bank performance.

1.6. Hypotheses

Based on the research questions of the study, the following hypothesis will be tested:

Hypotheses 1

Ho: Industry concentration has no impact on performance of Ethiopian Banks.

Ha: Industry concentration impacts performance of Ethiopian Banks.

Hypotheses 2

Ho: Efficiency has no impact on performance of Ethiopian Banks.

Ha: Efficiency impacts performance of Ethiopian Banks.

Hypotheses 3

Ho: Bank Specific Variables (such as Capital Adequacy, Asset quality, Management, Earning, Liquidity) have no impact on the Performance of Ethiopian Banks.

Ha: Bank Specific Variables such as Capital Adequacy, Asset quality, Management, Earning, Liquidity) have impact on the Performance of Ethiopian Banks.

Hypotheses 4

Ho: External factors (sector and macroeconomic) have no impact on the Performance of Ethiopian Banks.

Ha: External factors (sector and macroeconomic) have impact on the Performance of Ethiopian Banks.

Hypotheses 5

Ho: Regulation has no impact on the Performance of Ethiopian Banks.

Ha: Regulation impacts the Performance of Ethiopian Banks.

Hypotheses 6

Ho: There is no 'quiet life' situation in the Ethiopian Banking industry

Ha: There is a 'quiet life' situation in the Ethiopian banking industry

1.7. Rationale

Empirical investigation of the effect of industry concentration and bank performance determinants is justified as:

- Empirical evidence shows that broader, deeper financial markets are strongly associated with future economic growth (Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998; Levine et.al., 2000). Therefore, building a robust financial system among others requires exploring multifaceted factors that can impact on the performance of banks, key players of the financial markets.
- There appears a heated debate on the literature on both theoretical and empirical grounds concerning the relationship between industry concentration and performances. Since the controversy has not been resolved, the area deserves further exploration.
- The analysis of market power in banking has substantial significance in many fronts. The market structure study in banking is especially important because its impact translates into a high cost of financial intermediation, a lower volume of savings and investment and, therefore, lowers economic growth (Idres, 2009).

The Ethiopian banking industry appears to be appropriate for the investigations of industry structure and bank performance relationship because:

- the banking system in Ethiopia is dominated by the big public bank and is protected from foreign competition which is conducive to collusive behavior or for market concentration.
- the banking industry is also tightly regulated where entry of even new private local banks is not easy following regulatory measures enforcing barriers to entry. Therefore, regulation could have impact on market concentration and performance.
- the current move of the government in merging the two state owned banks exacerbates the already surged concentration in the industry. The increased consolidation might also result in greater market power to public banks created by increasing the market shares of the merging banks.

1.8. Scope of the Study

The main theme of the research is to empirically explore the impact of industry concentration on the performance of banks. It also investigates the relationship between various factors from internal and external environment with bank performances and evaluates the conduct of banks with the given factors. Finally, based on the findings, it drives a comprehensive model of bank performances. Therefore,

- as the entire banking system before the reform measure of the 1990s was dominated by fully government owned banks, considering such period for the evaluation of structure- performance will not have practical significance. Therefore, the study focus is on the period after the financial liberalization which is the time when series of policy measures has changed the concentration, ownership structure and performance of the banking system.
- the study considers the performance of banks that are established for commercial or profit motive only. Banks like the Development Bank of Ethiopia pursuing non-commercial activities are excluded from the research.

- the study concentrates on variables from the Ethiopian macro economy, industry and banks affecting the profitability performance. A comparison of such variables with other regional and global banks and/or other institutions in the Ethiopian financial system remains out of the scope of this research work.

1.9. Organization of the Study

The thesis is organized into eight chapters. Chapter one deals with the introduction and background of the banking industry. Chapter two provides the theoretical background in which the study is conducted. In this chapter, a broader review on the historical origin of the industrial organization theory with specific focus on the structure-performance model is made. The competing hypothesis and contemporary theories of competition and market structure studies are explained. The rationale of choosing the structure conduct-Performance framework is also explicated. Chapter three comprises the empirical literature related to market structure and efficiency studies. This chapter provides empirical evidence on country studies, methodologies adopted, the variables used among others. In addition, discussion on the gaps within the studies and the model and variables to be applied in this study are presented in more detail. Chapter four sets a conceptual framework and the description of the variables used in the study. Chapter five frames the research design and the methodological choice to meet the research objectives. It provides evidences on why explanatory research design is selected; the research approach, data source, sampling techniques etc are discussed. The reliability and validity, ethical, the timing decision, weighting decision, and integrating decision are elaborated. The next chapter presents the empirical results of the quantitative study. Estimated results are discussed and specified hypotheses are tested. This is followed by analysis on the qualitative study utilizing data from the interview process. The final chapter presents the summary of the results integrating the result from both the quantitative and qualitative approaches. It also summarizes the conclusions derived from the analysis and suggests actionable items in the form of recommendations. Furthermore, it explores the contributions, limitations of the study and areas for further research work.

CHAPTER TWO

THEORY AND LITERATURE REVIEW

2.1. Introduction

The literature review begins with an outline on the definition and historical evolution of the field of industrial organization up to its current state. In particular, a review on the shift in the field's emphasis over time from the endeavor to address measures across industries towards more individual industry related studies. The second part of the review highlights key ideas on the focus of the industrial organization. The detail model of the structure-conduct-performance paradigm is also reviewed in the subsequent section. This is followed by a review of the alternative structural and non-structural models of industry structure evaluation.

2.2. Industrial Organization- Defining the concept

Industrial Organization (IO) is known by several names in the literature such as 'Economics of Industries', 'Industry and Trade', 'Industrial Organization and Policy', 'Commerce' and 'Business Economics' etc. However, several authors (Stigler, 1968, Cabral, 2000) have used 'Industrial Organization' as an appropriate title of the subject. Despite the diversity of naming, there seems a consensus on the definition and scope of IO. On much broader sense, authors consider IO to have concern on three areas: the firm, markets and industries. For instance, the most illustrious definition of IO by Stigler contains all three elements. He defined industrial organization as *'the application of microeconomic theory to the analysis of firms, markets and industries'* (Stigler, 1968, p. 1).

Another definition with similar contextual meaning is from (Cabral, 2000) *'Industrial organization is concerned with the workings of markets and industries, and in particular the way firms compete with each other'* (Cabral, , p.9). This definition provided more prominence to IO's focus on the competition among firms in the industry. A rather more

specific definition of IO is also forwarded by Church and Ware (2000). They defined IO as *'the study of the operation and performance of imperfectly competitive markets and the behavior of firms in these markets'* (Church and Ware, 2000, p.7). The definition interestingly defined the type of market the IO study basically provides greater attention i.e. imperfect competitive market. The existence of imperfect competition or the degree of existence of all the stated factors is a reflection of the differences in market power of firms in the industry. In such regard, Church and Ware (2000) provided an alternative and very specific definition to IO, i.e. *'it is the study of the creation, exercise, maintenance, and effects of market power'* (Church and Ware, 2000, p.31).

The other dimension of IO definition is related to explaining the root of the field. Barthwal (2010) argues that *'IO as a field developed from microeconomics and is concerned with economic aspects of firms and industries seeking to analyze their behavior and draw normative implications'* (Barthwal, 2010, p. 15). He explained that there are differences between those two theories. Microeconomics is formal and deductive, whereas, Industrial economics is less formal and more inductive. Furthermore, microeconomics is a passive approach with the aim of profit maximization of a company, without concerning operational aspects of the company. Industrial economics' emphasis is on the operational aspect and tries to explain the working and changes in the existing system. His argument also get support from other authors like Ramsey (2001) who suggested that the focus of IO theory is on the market a company operates in, rather than the company itself . Ramsey (2001) supports the market focus of IO being reflected in the structure-conduct-performance model, which claims that there is a causal link between the structure of a market in which a company operates, the organization's conduct and in turn the organization's performance in terms of profitability. Thus, the industrial organization theory focuses on the whole industry and market conditions of a company.

Shepherd (1972) further explained the difference as microeconomics typically focuses on the extreme cases of monopoly and perfect competition while industrial organization focuses primarily on the case of oligopoly. That is to mean, a competition between few

firms in an industry whose number is more than one unlike in monopoly, but not as many as in competitive markets.

Some authors also provided a strategy or conduct focused definition of IO. For instance, Salinger (2000) explained IO as the field that tries to understand the behavior of companies and what that behavior means for the well-being of consumers. This appears to be the area where the overlap between strategy management and economics was apparent. For instance Porter (1981) has used the SCP model to design its industry analysis model. He claimed that the central analytical aspect of IO can be used to identify strategic choices which firms have in their respective industry. More specifically, IO has offered strategic management a systematic model for assessing competition within an industry (Porter, 1981). Church and Ware (2005) support the close association of the two fields of the study. The focus of the new industrial organization on the behavior /conduct of firms in imperfectly competitive industries involves determining the firms' strategies to win a competitive advantage in the market. Therefore, IO that has a bearing on industry and firm level study appears as a theory of business strategy.

2.3. History of Industrial Organization

Literature shows that it is difficult to identify the exact beginnings of IO because of limited historical records on the field (Hampfrey, 1940). There appear, however, some evidences according to which monopolistic practices and other elements of the industrial economics were in operation as far back as 2100 BC (Trucker, 2010) However, written records revealed that the foundation of economic theory was the book of Adam Smith in 1776 named "*Wealth of Nations*". In his economic theory, Smith (1776) discussed the principles of division of labor and analysis of pricing which were described by some authors like (Barthwal, 2010)) to represent the concept of IO.

Corley (1990) in his article, '*Emergence of the Theory of Industrial Organization, 1890-1990*', classified the history of IO into eras and referred to Marshal as pioneer to present

ideas about IO. The eras incorporate: Alfred Marshall Era, Cournot Legacy (1890-1933), Era of Controversy (1933-1951), The Emergence of Industrial Organization Studies (1950s) and developments after 1960 onwards. Corley associated Marshall to the theory of IO due to his focus on competition and being a pioneer to integrate the concept of entrepreneur into analysis of firm value. *'Marshall's basic ideas on the firm centered around competition which he saw in terms of an activity or a process rather than in modern structural terms'* (Corley, 1990, p.88).

Following Marshall (1889), Cournot formulated an economic model used to describe an industry structure in which companies compete on the amount of output they will produce (Hal, 2006). He began with the monopolistic case and progressively extended the number of producers in the market until he reached the opposite pole of unlimited competition. At this pole, each firm contributed too small a proportion of the whole to affect the going industry price. Cournot discussed duopoly, suggesting that self-interest would induce the two rivals concerned to reach a determinate and mutually advantageous solution. However, he failed to analyze the commonest market form in advanced economies, namely oligopoly (Corley, 1990). This makes it the model to diverge from the current attention area of the IO and the facts in the real world which is the imperfect market and mainly of the oligopoly.

The developments up to 1933 were the gradual realization of the existence of an entirely new academic subject, the theory of the firm. Coase (1937) set out his transaction cost theory of the firm which is one of the first attempts to define the firm theoretically in relation to the market. His work is followed by a number of economic theories that explain and predict the nature of the firm and including its existence, behavior, structure, and relationship to the market (Demetri, 2007). Therefore, the period has diverted attention of earlier economists' work on corporate topics to clarify aspects of value theory. Corley (1990) named this period as *'an interlude before the pace of constructive work accelerated in the 1950s'*.

2.4. The Modern Theory of Industrial Organization

By the end of the 1930s, the field of IO started to come together and take shape (Schmalensee, 2012). Partly this was due to the influence of Edward Mason at Harvard (Mason 1939, 1957) and partly due to the industrial data collection and analyses practice. Schmalensee (2012) considers that in the modern era, IO economists have played an important role in industry studies in support of broad assertions regarding market conduct and performance. The modern era can also be further classified into three groups based on the dominating school of thought (Kovacic and Shapiro, 2000).

2.4.1. Harvard School

After the 1930s, scholars from the Harvard school began to focus on the structure of both firms and industry (Schmalensee, 2012). A notable influence from this school was from Mason (1939) who pointed out that the size of a firm has an impact on its competitive policies in the market. Mason (1939, p.73) explained that:

“The relative size of a selling unit, to recapitulate is one element-doubtless a very important one-in the structure of a firm’s market. As such it exerts an influence on the policies and practices of the firm. But firms of given size, relative to the extent of their markets, will follow very different price and production policies in different market situations.”

Another significant influence is from the school has been from Bain (1951) who has assembled a sample of census industries and linked them to profitability data. He has found that industries in his sample with four-firm concentration ratios above 70 percent had distinctly high accounting profit rates than did the others (Bain, 1951)

Bain (1956) has improved such concept further in his book, ‘Industrial Organization’. He laid out the Structure - Conduct - Performance (SCP) which is used as an analytical framework to make relations among market structure, conduct and performance. Bain

(1956) established that the market structure of an industry determines its conduct and thereby impacting firm performances. The SCP paradigm, with some further economics based supplements, became the basis for much of the modern version of '*Merger Guidelines*' (White, 2006).

As implications of all this, Harvard School, recognizes market power as being a factor to be controlled and establishes a relation between the concentration ratio and its harmful effects on social welfare (Weiss,1971). The 1960s and early 1970s saw further elaborations of the SCP paradigm and more extensive testing of the profitability-concentration relationship with the inclusion of entry conditions (Mann, 1966; Weiss, 1971), advertising (Comanor and Wilson, 1967, 1974), foreign trade (Esposito F. and Esposito L.,1971), the structural conditions on the buyers' side of the market (Lustgarten, 1975), risk (Bothwell and Keeler, 1975), and the presence of a critical concentration ratio (White, 1976). The concept of efficiency has also started to grow from this school. Harbison (1956) drew on the concept of entrepreneur and suggested that so called inefficiency could be due to entrepreneurs behaving rationally in pursuing other goals than profit maximization such as social advancement. Furthermore, he remarked that efficiency could also be reduced by inadequate knowledge and inappropriate organizational structure which could lead to loss of effective control over subordinates. These important ideas were further developed later (Leibenstein, 1966). He stated that '*...the amount to be gained by increasing allocative efficiency is trivial while the amount to be gained by increasing X-efficiency is frequently significant.*' (Leibenstein, 1966, P. 45)

2.4.2. Chicago School

The Chicago School counter upheaval focused on SCP, which argued that high concentration might be causing high profit rates, because of economies of scale (Goldschmid, 1974). A further attack to the profit-concentration relationship also aroused on the use and reliability of the accounting data that were used to measure the profit rates (Anthony, 1986; Salmon, 1985). In addition, there were critics on whether

relative profit rates were even the appropriate indicators of market power (Fisher and McGowan, 1983). Profit-based tests of the SCP paradigm quickly tailed off, but were soon replaced by price-based studies drawn from individual industries (Weiss, 1989; Bresnahan and Schmalensee, 1987). Results, however, tended to show a similar positive relationship between prices and market concentration. There was a general consensus among this school's scholars that the relationship between market structure and performance is a reflection of the efficiency of big firms which allowed them to be prominent from the market (Simrlock, 1985). In other front, Demsetz (1974) argued that the pragmatic relationship between profitability and concentration could be due to the large market shares of firms in highly concentrated industries. Therefore, the emphasis of the school seems changed in regard to price and efficiency theory.

2.4.3. Game Theory

Game theory appears as a separate topic of strategic decision making after the publication of the '*Theory of Games and Economic Behavior*' by Von Neumann and Morgenstern (1944). In 1950, John Nash demonstrated that finite games always have an equilibrium point at which all players choose actions which are best for them given their opponents' choices. Game theory received special attention in 1994 with the awarding of the Nobel Prize in economics to Nash, John Harsanyi, and Reinhard Selten. In general, the theory has provided emphasis on strategic decision making of the firm applying mathematical models using Nash equilibrium (Corley, 1990). The theory has supported some of the topics in industrial organization. These include entry deterrence; limit pricing and predation; theory of collusion in markets with public demand theory of sales and price wars (Bagwell and Wolinsky, 2000).

2.4.4. The New Industrial Organization

According to Tirole (1988), modern research in IO is challenged by: lack of convincing theoretical models to study imperfect competitive market situations and lack of quality

data that limited empirical work about competition or industry structure. The focus of the empirical research related to industry structure mainly relies on cross industry analyses that established a link between industry concentration scenarios across industries with market outcomes (Bresnahan and Schmalensee, 1987). Nevertheless, the aforesaid challenges later has set stage for a dramatic shift in the 1980s toward a specific industry based analysis and firm behavior. This period as coined by Bresnahan (1989) is called the '*New Empirical Industrial Organization*' era. The basic premise of the approach was the idea that cross industry variation was often going to be problematic. Therefore, the new research path should follow the institutional details of particular industries and about specific behavior of firms. Bresnahan and Schmalensee (1987, p. 21) named the move as '*...a shift toward the firm, rather than the industry as the unit of observation.*

Studies frequently focus on a single industry or market, with careful attention paid to the institutional specifics, measurement of key variables and econometric identification issues (Weiss, 1992). The focus on individual industries offers the best opportunity to understand the competitive mechanisms at work (Bresnahan, 1989). Unlike the empirical literature on SCP, which was primarily based on cross-section studies, the New Empirical Industrial Organization (NEIO) focuses on econometric testing of particular aspects of conduct in single industries with the objective of detecting market power or changes in the collusive-competition behavior of firms (Weiss, 1971). Weiss (1971, p.398) opined that '*perhaps the right next step is back to the industry study, but this time with regression in hand*'. The approach entails the construction of explicit structural models that provide theoretical analysis of how firms in the industry would behave under different market structures (Comanor, 1971).

Even though the NEIO has named as the new IO, the existing literature on market power shows that there is no unanimous agreement on which of these two methods should be used to analyze the market power (Bhuyan, 2014). For instance, much of the literature on developing countries' experiences continues to be based on the SCP paradigm and even in developed countries the number of NEIO studies is far less than the number of SCP-based studies that have been carried out thus far (Lee, 2007). In

addition, the empirical debate between the Chicago and Harvard schools is still hot and is reflected in research works of both developed and developing countries (Kapunda and Molosiwa, 2012). Most importantly, literature has not yet resolved a critical question of what determines industry competitiveness considering both firm strategies and market structure and this remained the important center area of IO. Therefore, NEIO appears to be the alternate paradigm for imperfect market analysis than the one totally revoking the methodological approach of the SCP, in fact, with friction between the two paradigms (Bhuyan, 2014). Bhuyan (2014) has compared these two methods of analyzing market power and concluded that the debate over the use of the SCP versus the use of the NEIO approaches to analyze market power will continue.

2.5. Focus areas of Industrial Organization

Shepherd (1972) more specifically considered the focus of industrial organization to assess the astonishing phenomenon between the two extreme market conditions i.e. competition and monopoly. He elaborated the concept through methodological approaches as well.

“Industrial Organization (IO) like most scientific fields has a double identity. On the one side it appears an abstract subject with full set of analytical concepts about the market. On the other hand, the topic is about real markets, teeming with the excitement and drama of struggles among real firms. The field applies the concepts to the reality providing meaningful insight through explaining effects and providing measurement and testing procedures.” (Shepherd, 1985, p 2).

IO is, therefore, concerned about both markets and firms where the applicability and explanatory power of the theory of perfect competition is questionable. Therefore, IO analyzes empirical data on imperfect competition through empirical data assessment and explains the behavior and performance of both firms and the industries to which they belong (Caves, 2007). This suggests that the center of attention of the field relies from the perspective of the firm as a separate entity as well as the market in which the firm operates on. Lipczynski, Wilson and Goddard (2013, p. 6), demarcated the focus area of IO as:

“...investigate the size structure of firms (one or many, ‘concentrated’ or not), the cause (above all economies of scale) of this size structure, the effects of concentration on competition, the effects of competition on prices, investment and innovation and so on.”

Therefore, the main theme in IO includes structural analysis of the industry (including oligopoly, concentration, barriers to entry, performance, market structure etc). On the other front, it incorporates analysis on the theory of the firm (including analysis of firm strategy, pricing, product differentiation, advertising, auctions, research and development to mention a few (Lipczynski, Wilson and Goddard, 2013).

As the main objective of this thesis lies on the market (industry) structure analysis, the subsequent review will delve into market structure and related aspect of the industrial organization.

2.6. The Structure-Conduct-Performances (SCP) Hypothesis

Mason (1937) and Bain (1956) formulated a framework for empirical analysis of the effect of market structure on industry performance called the Structure-Conduct-Performance (SCP) model. The central hypothesis of the framework is that observable structural characteristics of a market determine the behavior of firms within that market, and the behavior of firms within a market determines measurable market performance (Bain, 1951). In short, SCP paradigm assumes that market structure would determine firm conduct which would determine performance (Bain, 1956). This is a paradigm that is foundational to industrial organization economics (Barney, 2007). Since its conception, it has been used to analyze markets and industries, not only in Economics, but also in the fields of business management. For instance, the mainline of Michael E. Porter’s works on competition (Porter’s diamond model) are based on premises derived from this paradigm (Porter, 1981). Lipczynski, Wilson and Goddard (2013, p.6) stated the importance of the SCP paradigm in several ways:

- It allows the researcher to reduce all industry data into meaningful categories ;

- It is consistent with the neoclassical theory of the firm, which also assumes there is a direct link between market structure, and firm conduct and performance, without overly recognizing this link;
- by defining a workable or acceptable standard of performance, it may be possible to accept an imperfect market structure, if such a structure produces outcomes that are consistent with the acceptable standard. By implication, market structure can be altered in order to improve conduct and performance.

2.6.1. Assumptions of the SCP Framework

The SCP framework posits a stable relationship and a line of causality that runs from structure through conduct to performance (Church and Ware, 2000). Consequently, the original SCP paradigm assumes a one-way relationship between structure, conduct and performance. This is the assumption that market structure determines market conduct and thereby affecting market performance (Roth, 2005).

The SCP paradigm asserts that conditions of supply and demand in an industry determine its structure. The competitive conditions that result from this industry structure influence the behavior of companies and in turn dictate the performance of the industry (Smit and Trigeorgis, 2004). Therefore, the model assumes that market structures identified by many firms providing the same products and services, though relatively equal in firm size, are competitive markets generating greater performance (Carlton and Perloff, 2000). Then, the degree of concentration of firms' output in a market affects the extent of competition among these firms in the industry. This is so because of the assumption that a more highly concentrated market structure is more likely to produce more effective collusion (Sathye, 2005). In other words, SCP model suggests that market concentration lowers the cost of collusion between firms and ends in suboptimal profits for all market participants (Bain, 1951).

The paradigm further assumes that equilibrium states and perfect information are found in practice (Ferguson.G and Ferguson.P, 1994). As McWilliams and Smart (1995, p.

309) suggested *'the original SCP-paradigm is based on the assumptions that demand is known and constant and that competition is a state'*. The underlying assumptions of the SCP approach, for example, that firms attempt to maximize profits, that firms have perfect information and that tastes are constant, lead to the conclusion that perfect competition is the ideal market structure (Roth, 2004). The market structure of perfect competition requires five necessary assumptions that include the following: firms sell a homogeneous product; there are a large number of small firms; firms are price takers; there are no barriers to entry and exit in the long run and firms and consumers have perfect information (Beaulier and Mounts, 2008). Obviously, these characteristics are unrealistic for most industries including banking.

The degree of concentration in a market has been considered as one of major structural characteristics in the traditional SCP-paradigm which predicts the level of competition (Meschi, 1997). The SCP assumes that market concentration and level of competition are inversely related as industry concentration encourages collusion (Edwards et al., 2006). Methodologically, such relationship is witnessed when industry concentration and performance are positively related (Allen et al., 2005). In such situations, firms operating in highly concentrated industries will have a higher return than firms operating in less concentrated industries regardless of their efficiency level. Similarly, such scenario will put industry concentration to inversely relate to the welfare of the consumer as well as the number of firms in the industry (Shepherd, 1985). In addition, the price of the firm gets closer to marginal cost if concentration falls which leads to fall in market power as well (Nguyen and Stewart, 2013).

The other assumption of the SCP is that the firm conduct is determined by the structure of the industry, hence; there will be a main linkages running from structure through conduct to performance (Bain, 1956). However, later critics have pointed that various feedback effects are also possible, i.e. from performance back to conduct; from conduct to structure and from performance to structure (Phillips, 1976; Clarke, 1985).

2.6.2. Components of the Structure-Conduct-Performance (SCP) Framework

As outlined above, the SCP framework is mainly a composition of three core components: market structure, conduct and performance. Nevertheless, these elements are later expanded to incorporate public policy/regulation, demand and supply situations etc.

a. Market Structure

Conceptually, a market structure is a classification system for the key traits of a market, including the number of firms, the similarity of the products they sell, and the ease of entry into and exit from the market (Trucker, 2010). It mainly comprise the market share of its firms, and to a lesser extent, any barriers against new competitors (Bain, 1956). Each market structure is somewhere in the range between monopoly (a high market share and entry barrier) and pure competition (low share and barriers) (Shepherd, 1985). Salvatore (1998) identifies four different types of market organizations i.e. (a) perfect competition at one extreme, (b) monopoly at the opposite extreme, (c) monopolistic competition and (d) oligopoly in between. In addition, Shepherd (1985) included the concept of the dominant firm as a firm having 50-100% of the market and no close rival. He further classified oligopoly into two, i.e. tight oligopoly (the leading four firms combined share 60-100% of the market) and loose oligopoly (the leading four firms have 40% or less of the market). Competitive power is one of the basic criteria to distinguish various forms of market. However, it can be maintained that the actual market power depends on the competition or monopoly power. The tilt of this power determines the benefits either to the buyer or to the seller. The concept of a market structure is, therefore, understood as those characteristics of a market that influence the behavior and results of the firms working in that market (Hay and Morris, 1991). The interaction and differences between these behaviors and results allow for the existence of several market structures. Therefore, competition or market power is stated as the reason for the existence of different types of market structure. Thus, how such variation in market structure affects the performance of firms appeared to be the most important question that needs to be addressed in such regard (Mason, 1937). As explained above

the main theme of the SCP paradigm appears to investigate the validity and existence of such kind of cause-effect relationships.

In the SCP-paradigm, structure describes the characteristics and composition of markets and industries in an economy (Ferguson,1994). Structure, therefore, incorporates those set of variables that are relatively stable over time and affect the behavior of sellers and/or buyers. Structure is given a broad meaning covering assortment of different characteristics relation both to individual firms and relationships between firms (Needham, 1970). This distinguished approach of definition depends on whether structure is viewed internal or external to the individual industry (Devine, 1976). On the one hand, structure refers to the relative importance of individual industries (or groups of related industries) within the economy and to patterns of transactions between these industries. On the other, structure is a concept derived from the received theory of the firm which analyses business behavior according to the structure of the market in which it operates. Therefore, structure refers to the level of seller and buyer concentration, the height of entry barriers and the degree of product differentiation within individual industry markets (Shepherd,1985).

Literature considers the main elements that influence market structure to include such factors as seller concentration, product differentiation, barriers to entry and barriers to exit, buyer concentration and the growth rate of market demand (Lipczynski, Wilson and Goddard, 2013). Other elements of market structure exist, but they are usually unstable and, therefore, ignored either because they can't be measured or because they are hard to observe (Belleflamme, Martin and Peitz, 2010). These factors; therefore, determine the extent of the market and the competition level. According to Bain (1968), seller and buyer concentrations, firm's size and entry conditions are the basic elements of market structure. These elements in one way or the other influence market integration. Seller concentration or buyer concentration inhibits the free flow of goods and services among markets. This in turn distorts the spirit of a unified or integrated market.

The higher the concentration is, the closer the market would be towards a monopoly structure (Bain, 1968). Mohamed (2013) describes a market as concentrated if there are few number of firms in the production or there is an unequal distribution of the market shares. The more the concentration level of the industry, the higher would be the degree of monopoly and competition loss (Weiss, 1974). Low concentration of an industry indicates less market power held by the leading firms which empower them to consistently charge price above those that would be established by competitive market (VanHoose, 2009). Therefore, the industrial organization studies claim that market power in the hand of single producer or fewer numbers of producers, enable a firm to set price above the marginal cost.

The degree of product differentiation is another important factor since it can refer to an imperfection in the substitutability (to buyers) of the output of competing sellers in an industry (Lipczynski, et al; 2013). Differentiation is important variable affecting market structure since it could strengthen the firm's market position and profit. Moreover, product differentiation can act as an entry barrier (Church and Ware, 2000). This is due to fact that in case of strong brand loyalty, the new entrant might be required to pay the price of convincing consumers to buy his/her product by offering better terms e.g. quality or price or greater advertising (Church and Ware, 2000).

Similarly, if the entry condition is restricted, the biggest firm may control the entire market and this leads to weak performance by other firms (Bain,1968). These barriers have an effect on conduct as well as on firm performance because entry barriers place influence on the price setting mechanisms of established firms. In other words, the higher the entry barriers, the higher the limit to set prices (Carlton and Perloff, 2000). On the flipside, ff there are no entry barriers, existing firms in the industry cannot maintain prices above marginal costs and earn above normal profits. Any profits associated with non-competitive pricing would then invite entry which would continue until all profits are competed away (Church and Ware, 2000). Moreover, entry barriers are required in order to exercise market power (Tung et al; 2010). Therefore, entry barriers are one of the determining factors for market concentration.

In sum, market structure is characterized by several factors that determine the level of competition and market power. In other words, the structural elements seem to influence strategically the nature of competition and pricing within the market. Therefore, the firm's conduct should fit the characteristics of the market (Weiss, 1978). This will directly affect the performance of firms in the industry. Therefore, studying market structure enables to derive the conduct of firms in the industry. Other scholars also shared the same view, for instance, George and Singh (1970) and Dahl and Hamxond (1977).

b. Conduct

In the opinion of Bain (1968), market conduct refers to the pattern of behavior followed by firms in adopting or adjusting to the markets in which they sell or buy. It is the way in which buyers and sellers behave both amongst themselves and amongst each other (Wang,2010).This happened because firms choose their own strategic behavior, investment in research, in development, advertising levels, collusions, etc. According to Moore (1973), market conduct comprises several methods practiced by traders to attract the customers to the business. It includes several price competition methods and non-price inducements. Purcell (1973) defined market conduct to refer to the actions and behavior of firms within the given structure. Pricing policies, selling cost, non-price competition are all some of the activities of market conduct. Therefore, market conduct resembles the behavioral pattern of firms in an industry. It comprises of various decision making techniques in determining price, output, sales promotion policies and other tactics to achieve their economic goals (Grigorova et al., 2008). Thus, given the structure of the market, market conduct determines firm performance. Conduct in the SCP paradigm is assumed to be directly influenced by the market structure (Bain, 1956).

As conduct involves the behavior (actions) of the firms in a market, the behavior of the firm is, therefore, determined by the structural characteristics of the industry (Mohamed,

2013). Scherer and Ross (1990) suggest that conduct in the SCP paradigm is related to the firms' product strategies, innovation and advertising. It focuses on how firms set prices, whether independently or in collusion with other firms in the market and on how firms decide on their advertising and research budgets and how much expenditure is devoted to these activities (Ferguson, 1994). Conduct also takes into consideration the pricing strategies and product strategies of the firms within an industry, research and development, mergers, legal strategies, etc. and a product strategy where each firm is constantly attempting to develop new brands (Grigorova, 2008). These aspects of conduct are influenced by the structure of the market since the firm's activities are based on the environment it is in to be successful (Mohamed, 2013). Lipczynski, Wilson and Goddard (2013) provide some list of elements of business conduct that are influenced by the structure of the market that include: business objectives, pricing policies, product design, branding, advertising and marketing, research and development as well as collusion and merger. They also provide further explanation on the elements of conduct that include the following:

- The objective that firms pursue often is derived from structural characteristics of the industry, in particular the firm size distribution.
- The extent of a firm's discretion to determine its own price depends to a large extent on the industry's structural characteristics.
- Natural or inherent characteristics of the firm's basic product are likely to influence the scope for non-price competition centered on product design, branding, advertising and marketing.
- Together with advertising and marketing, investment in research and development provides an outlet for non-price competition between rival firms. The extent and effectiveness of research and development investment, and the pace of diffusion are critical determinants of the pace of technological progress
- Collusion is another option open to firms wishing to avoid direct forms of price or non-price competition. Therefore, collective decisions concerning prices, output levels, advertising or research and development budgets will be reached. Collusion

may be either explicit (through an arrangement such as a cartel), or implicit or tacit (through a less formal agreement or understanding).

- Horizontal mergers (between firms producing the same or similar products) have direct implications for seller concentration in the industry concerned. Vertical mergers (between firms at successive stages of a production process) affect the degree of vertical integration. Conglomerate mergers (between firms producing different products) affect the degree of diversification. Therefore, each type of merger decision provides an example of a conduct variable that has a feedback affect on market or industry structure.

On the other hand, there is a strong view that firm's conduct is able to influence the market structure. For instance, firms' conduct is able to change market structure through merger process. Different mergers, horizontal, vertical, or conglomerate, are of different influence on the structure of market. This is because mergers between firms could increase market power, by increasing the market share or the entry barriers in an industry (Shepherd and Wilcox, 1979). Shepherd and Wilcox (1979) argue that when a horizontal merger takes place, market concentration increases, competition reduces and the merging firms increase their market power over prices. Concluding from this, one could say that together with structure, conduct defines performance. Hence, firm's conduct is also capable of changing the market structure.

c. Performance

In the view of Bain (1968), market performance deals with the economic results that flow from the system in terms of its pricing efficiency and flexibility to adapt to changing situation etc. It represents the economic results of the structure and conduct. According to Narver and Savitt (1971), performance was the net result of the conduct and was measured in terms of net profits, rate of return on owner's equity, efficiency with which plant, equipment and other resources were used and so on. Market performance is related to market structural conditions and firms' conduct with regard to pricing and product policies and profitability (Bain, 1956), productive and allocative efficiency

(Neuberger, 1997), Growth (Lipczynski et.al; 2013) are regarded as important performance indicators. In terms of measurement, performance is measured by comparing the results of firms along the industry in relation to price, quantity, product quality, resource allocation, production efficiency, etc. (Neuberger, 1997). This is usually applying the accounting measures such as RoA, RoE, NIM etc. which in fact is subjected to several criticisms. On the other front, market performance resembles price level, profit margin, level of investment, reinvestment of profit etc (Hay and Morris, 1991). In other words, through the level of prices, the level of profit margin etc., one can determine the degree of market integration which has a bearing on both the structure and conduct of firms. Therefore, the economic result of market structure and market conduct represents market performance. From the above observations, it can be maintained that market performance is the combined result of market structure and market conduct.

d. Regulation

Neubrger(1997) has re-modified Bain's SCP framework by incorporating important variable in industry structure study and public policy. His argument relies on the fact that government policy can operate on almost all of the SCP variables: structure, conduct and performance variables. According to the SCP paradigm, if an industry comprises only a few large firms, the abuse of market power is likely to lead to the level of output being restricted and prices being raised above the equilibrium level (Lipczynski et.al, 2013). The stifling of competition is likely to have damaging implications for consumer welfare (Shafer, 2004). This suggests that there is a role for government or regulatory intervention to promote competition and prevent abuses of market power (Neubrger,1997). Lipczynski et.al, (2013) suggested that regulation involvement includes direct measures on market or industry structure. They pointed that competition might be promoted by preventing a horizontal merger involving two large firms from taking place or by requiring the break-up of a large incumbent producer into two or more smaller firms. Moreover, involvement might be targeted directly at influencing conduct through restricting a firm with market power from setting a profit-maximizing monopoly price. In addition, a wide range of government policy measures (fiscal policy,

employment policy, environmental policy, macroeconomic policy and so on) may have implications on firms' performance, measured using indicators such as profitability, growth, productive or allocative efficiency.

2.7. Competing Hypotheses

There have been two ways of classification on the approaches and methods to assess the level of competition, namely, tests on structural and nonstructural characteristics (Bikker, 2004). The structural methods focus on characteristics such as the level of concentration in the industry, the number of banks, market share, etc. (Bain, 1951). Structural theories consist of the SCP framework and the Efficiency Hypothesis (ESH) (Bikker and Haaf, 2001) and other variants like the quiet life hypothesis (Hicks, 1935) and contestable theory of the firm (Baumol, 1988). As revealed in the previous section, a useful organizing framework to think about competition and market power is provided by the structure conduct performance paradigm. This part of the literature considers other structural and non-structural competing hypotheses.

2.7.1. Efficient Structure Hypothesis

The Efficient Structure Hypothesis (ESH) underscores that market concentration emerges from competition where firms with low cost structure increase profits by reducing prices and expanding market share (Simrlock, 1985). This remains to be a competing as well as alternative rationalization for the link between industry concentration and performance. As proposed by Demsetz (1973) and others (Peltzman, 1977; Gale and Branch, 1982) higher performance of firms is the result of better efficiency. The hypothesis, therefore, the assumed positive relationship between industry concentration-performance is much a result of gains made in market share by firms with superior efficiencies. The final result, then, will be an increase market concentration whose main source belongs to better efficiency. Hence, better profits are not because of collusive activities as the traditional SCP paradigm would suggest

(Molyneux and Forbes, 1995). Therefore, firms with superior management or production technologies have lower costs of operation that apparently translated to higher profits.

The ES hypothesis predicts that under the pressure of market competition, efficient firms win the competition and grow, so that they become larger, obtain greater market share and earn higher profits. As a result, the market becomes more concentrated (Sathye, 2005). The firms, therefore, have two options to maximize their profit level: they either maintain their price and reduce firm size or by lowering price and expanding the firm size (Williams et al., 1994). Consequently, higher profits are generated by large firms as a result of their superior efficiency. The main conclusion in these regard is the extra profits generated can be considered as an economic return and not as a return on monopoly (Chortareas et al., 2009; Seelanatha ,2010).

Mathematically as well, the ES hypothesis posits that the positive correlation between performance and concentration is spurious and a positive relationship between market share (MS) and performance should be interpreted as the consequence of efficiency (Simrlock,1985). Philips (1976) further explained that market concentration and higher profitability may be the result of superior capabilities and economic efficiencies of firms in highly concentrated markets. A very vivid explanation of the theory of ESH is provided by Gale and Branch (1982, p.83) who stated that:

...market share, not concentration , is the primary structural determinant of profitability. Market share increases profits through the benefits of scale economies .In contrast, concentration affects profits by facilitating oligopolistic coordination. ...scale economies are far more powerful than oligopoly power in determining profit levels.... Provisions of our antitrust laws based on presumption that concentrated market structures lead to resource misallocation (...)are misguided and may well be leading to decreased efficiency.

The hypothesis has enjoyed significant support in the banking literature (Gilbert, 1984; Berger and Hannan ,1989, 1997; Berger, 1995). Among others, Smirlock (1985) and Molyneux and Forbes (1995) showed that there is a spurious relationship between concentration and profitability but between profitability and the proxy for the firm's

efficiency measure (market share). Other studies also diverted attention towards considering the effects of efficiency on structure-performance relationship through explicitly estimating components of efficiency (Berger and Hannan, 1993; Maudos, 1998; Mendes and Rebelo, 2003; Sathye, 2005; Papadoplous, 2004; Katib, 2004; Fu and Heffernan, 2009; Chortareas et. al., 2009; Seelanatha, 2010 etc.). The test of the ES hypothesis has been usually proposed in two different forms, depending on the type of efficiency considered. In the X-efficiency form, more efficient firms have lower costs, higher profits and larger market share, because they have a superior ability in minimizing costs to produce any given outputs. In the scale efficiency form, the same relationship described above is due to the fact that more scale efficient firms produce closer to the minimum average cost point (Berger and Hannan, 1993). Despite the controversies with the SCP hypothesis, the ES hypothesis has been tested in empirical studies in the context of a test of the SCP hypothesis (Weiss, 1974 and Smirlock, 1985). Therefore, ESH can be considered as an alternative interpretation to the SCP paradigm than a standalone model to totally disregard the SCP hypothesis. However, the debate among concentration and efficiency theories has not yet been satisfactorily resolved (Goddard et al., 2007).

As discussed above, the interpretation and implications of the two approaches seem flip sides of one another. The efficient hypothesis claims that industry concentration lowers competition, therefore, competition and efficiency remain inversely related. In other words, unlike the SCP paradigm, this approach has reversed the causality running from efficiency to competition. In contrast, the SCP establishes that a low degree of competition from high industry concentration results in market inefficiency. The view apparently is unlike that efficient theory that posits that a market becomes more efficient as it becomes more concentrated so that anti-concentration measures are unnecessary distortion in the economy (Goddard, 2001).

2.7.2. Quiet Life Hypothesis

As an extension of the structural theorists, both SCP and efficient hypothesis, Hicks (1935) came up to establish a relationship between industry concentration and level of

efficiency. The basic premise of the quiet life hypothesis lies on that a banking monopoly restricts the managers' initiatives to ensure efficiency. Hence, they prefer a quiet life situation free from competition. Therefore, firms operating in an increased concentration not only limit competition but also operate under reduced efficiency level. Therefore, the main focus of the hypothesis is on the effect of market power on efficiency. The view appears similar to the SCP but contrast with the efficiency theory as it presumed that competition is a driver of efficiency. Hicks (1935 p.8) explained the quiet life hypothesis as:

"....the subjective costs involved in securing a close adaptation to the most profitable output may well outweigh the meager gains offered. It seems not all unlikely that people in monopolistic positions will very often be people with sharply rising subjective costs; if this is so, they are likely to exploit their advantage much more by not mothering to get very near the position of maximum profit, than by straining themselves to get very close to it, The best of all monopoly profit is a quiet life."

In a concentrated market, firms do not minimize costs because of inadequate managerial endeavor, absence of profit maximizing conduct, lavish expenditures to obtain and maintain monopoly power and/or survival of inefficient managers (Berger and Hannan,1998). Under monopoly or high market power, firms and their managers prefer a quiet life which mathematically is observed under a negative correlation between market power and managerial efficiency. Berger and Hannan (1998, p.454-455) provide several justifications for the relationship between higher levels of market power and lower efficiency levels:

- Firms' discretion to levy high prices beyond the competitive levels discourages managers not to put the expected effort to control their costs. They prefer a quiet life that permits owners to earn price derived economic rents rather than the earning from effective cost control,
- Market power also results in managerial leisure that allows them to pursue objectives other than profit maximization. Such situation enforces managers to choose expense preference behavior or low risk taking behavior;

- Lack of competitive environment also creates a slack in resources that will wastefully be invested to obtain market power. This action obviously reduces the cost efficiency but profits may be higher as a result of acquired or purchased market power that raises the economic rent.
- Market power also incubates inefficient managers and allows them to persist in the system even without any intention to pursue goals other than maximizing firm value. Thus, ineffective managers whose main focus will be to protect market power resiliently operate in the system even they appear inefficient.

In fact, there are some views which contrast the justifications of the quiet life hypothesis specifically in the context of the banking system. In such regard, Petersen and Rajan (1995) proposed a counter argument to the quiet life hypothesis due to the fact that:

- banks with market power are associated with lower costs of borrowing and transaction monitoring. This advantage improves the efficiency of large banks and leads to a positive relationship between market power and cost efficiency.
- market power also allows banks to enjoy greater profits which may create incentives to behave prudently. This behavior leads to the selection of less risky activities with lower monitoring costs.
- banks with market power are under less pressure to increase the quality of banking services, consequently, decreasing the operating costs.

The above argument contrasts the justifications of Berger and Hannan (1998) who found that quiet life effects in banking remained several times more substantial than the social losses from the mispricing of products arising from market power. However, both explanations assume that the traditional SCP paradigm holds, at least partially. It should, however, need to be noted that the Quiet Life Hypothesis is not a necessary part of the market power paradigm, but is often included in it (Shepherd, 1979).

2.7.3. Contestable Market Theory

The theory of contestable markets which was first introduced by Baumol, Panzar and Willig (1982) in their book, '*Contestable Markets and the Theory of Industry Structure*' stated that the threat of entry can persuade firms in an industry to moderate their pricing behavior. Such scenario is observed irrespective of the number of firms in the industry. Free entry and exit (from industry without cost) are the cornerstone of the contestable market theory. Therefore, as long as the market is free to enter and exit without cost, it can effectively hinder market monopolist to limit its greed and abandon all likely high profits to enjoy. This is explained in Baumol (1982, p. 3-4) as:

"A contestable market is one into which entry is absolutely free, and exit is absolutely costless. . . . the entrant suffers no disadvantage in terms of production technique or perceived quality relative to the incumbent, and that potential entrants find it appropriate to evaluate the profitability of entry in terms of the incumbent firms' pre-entry prices. . . . The crucial feature of a contestable market is its vulnerability to hit-and-run entry."

In this sense, contestability theory offers an alternative theory of natural monopoly and the way in which consumers' interests are best served by the firm (Baumol, 1982). Unlike the conventional thinking, the theory doesn't recommend for a regulation of the natural monopoly.

"The contestability theory breaks the traditional thought in arguing against presumptive regulation of the monopolist. If the market were contestable, the pricing behavior of the incumbent firm would be disciplined by the threat of entry of competitors. In other words, the threat will induce something approaching competitive pricing on the part of the incumbent monopolist." (Bratland, 2004, p.4)

A perfectly contestable market exists only in the presence of potential competitors who constantly seek to enter (exit) the market to take advantage of available profit opportunities (avoid economic loss), suggesting that potential competition is a crucial

feature of perfect contestability (Martin, 2000). Perfect contestability further assumes competitive behavior among incumbents themselves not just with respect to potential entrants. Therefore, contestability theory represents a distinct move away from the SCP approach to industrial organization theory. Amavilah (2012) maintains that true contestability exists if:

- the profit for all firms in the industry remains zero. Therefore, a profit level exceeding zero (or a positive profit) motivates competition;
- inefficiency of any kind is not allowable. The system eliminates inefficiency as it associates with a positive short-run profit;
- price for the outputs should always be set equivalent to the marginal cost of production and predatory pricing is not allowable. A price above marginal cost attracts new entrants.

If these conditions are met, market structure, in itself will not be a worry as argued by the SCP theorists. In other words, high concentration will not have pressure on performance and remains a negligible case for regulatory intervention (Spulber, 1989,). Regulatory involvement is needed to ensure the above mentioned conditions: efficiency, price and others (Amavilah,2012).

2.7.4. Panzar and Rosse Model

The most commonly used non-structural model in studies (especially in banking) is the Panzar and Rosse approach (Rosse and Panzar, 1977; Panzar and Rosse, 1987). The models recognize that firms behave differently depending on the market structures in which they operate (Baumol, 1982). It also does not ignore the relationship between market contestability and revenue behavior at the firm level which the structural methods do (Perera et al.,2006).

The model is introduced as a test for imperfect market structures applying a comparative statics from revenue function and factor price elasticity (Panzar and Rosse 1987). The result determines the degree of competition or measures the market power

as well as competition conditions in a sector. Panzar and Rosse's approach is based on the idea that firms employ different strategies based upon the price, in response to changes in input costs of the market structure in which they operate (Leon, 2014).

In order to measure competitiveness of an industry, Panzar and Rosse (1987) had developed H-statistic whose value extends between $-\infty$ to +1. The competitiveness H measure is formulated as the sum of the elasticities of the reduced form firm revenue equations with respect to the firm's input prices. A perfect competitive market will have an h-statistic of 1 as an increase in production factor prices proportionally augments the revenue of the firm ensuring a long term equilibrium level of performances. In contrast, for a monopoly the H-statistic is inferior or equal to zero as the revenue of a monopoly negatively induces a change in market entry costs that proportionally increases the marginal costs and reduces production and revenue equilibrium. Therefore, when the costs of a company operating in a monopolistic or collusive market increase, this entity raises its prices, taking into account conditions proper to its situation as a monopoly, and its revenues diminish (Rosse and Panzar, 1977; Panzar and Rosse, 1987; Vesala, 1995).

The PR model can be explained by its simplicity and the fact that it does not pose stringent data requirements. The test can be derived by running only one equation requiring a few numbers of variables and banks. As a result, the PR model can be obtained from a relatively small number of observations, which is crucial for studies on less mature banking industry (Leon, 2014). Furthermore, Shaffer (2004) points out that the PR model is robust to the extent of the market as no specific market definition appears in the revenue equation. Only the data from firms included in the sample are required to estimate revenue equation. This is a huge advantage in cross-country studies (Claessens and Laeven, 2004).

The major pitfall concerns the econometric identification and the interpretation of the H-statistic. Brandt and Davis (2000) show that the H-statistic can be negative in a competitive market and positive for a monopoly. A negative H-statistic can occur even in

highly competitive conditions in the short-run with a fixed number of firms (Shaffer, 1983) or in the case of constant average cost (Bikker et al., 2012). Shaffer and Spierdijk (2013) point out that the H-statistic can be positive in highly noncompetitive settings. Furthermore, for firms facing constant elasticity of demand, theoretical studies report the H-statistic as alternatively increasing Shaffer (1983) or decreasing Panzar and Rosse (1987) function of market power.

2.8. Efficiency

Efficiency is producing the right goods/services of the right quality at the right cost. It is the success with which a firm uses its resources to produce output of a given quality (Farrell, 1957). Theoretically, a firm is fully efficient if it produces the output level and mix that maximizes profits and minimizes possible costs. The desirability of efficiency cannot be questioned, however, it may be difficult to achieve it since the planning and forethoughts of the managers responsible for production may not be perfect. In addition, the coordination of the complex operations may be difficult and inadequate and the knowledge on the current practice as well as of the factor prices may not be precise. All these are essential requirements for the achievement of the productive efficiency.

A broader concept that takes core of productive efficiency is the economic efficiency that may also be called business efficiency from a firm's point of view. The proportions on which the concept of economic efficiency depends on : i) resources at disposal of the firm are scarce and ii) they can be put to alternative uses, human capital, machine, materials, finance and time are the scarce resources from which one can produce. Given the scarcity these of resources and their alternative uses, it is quite natural for a rational firm to obtain the best from them (Barthwal, 1984).

According to Farrell (1957), production units overall economic efficiency is composed of two components, i.e. technical efficiency and allocative efficiency. In other words, economic efficiency refers to the combination of technical and allocative efficiency (Coelli et al, 1998). Economic efficiency incorporates efficient selection of goods to be

produced, efficient allocation of resources in the production of these goods, efficient choice of the methods of production and efficient allotment of the goods produced among the consumers. Economists argue that correct applications of the economic principles will bring about optimal efficiency in the allocation and utilization of all resources, their products and in competition with all other desires of the community.

The neoclassical assumes that producers in an economy always has an internal efficiency, that is, they are producing at their production frontier (allocative efficiency) with maximum output for given inputs (technical efficiency) and, therefore, are cost minimizers. The assumption of perfect internal organizational operations that assumes: no coordination failure, no prisoners dilemma and no market failure, can be considered to be dubious given the fact that performance indicators show inefficiency. This means, in reality however it remains apparent that two alike firms might not produce the same output. That means there will be a difference in cost and profit. This difference in output, cost and profit could be explained in terms of technical and allocative inefficiencies and same unforeseen exogenous shocks. Based on the ideas of Debreu (1951) and Farrell (1957), who built the standard framework of productive efficiency (production frontier), overall economic efficiency can be decomposed into scale efficiency, scope efficiency, pure technical efficiency and allocative efficiency.

2.8.1. Technical Efficiency

Technical efficiency in a production unit refers to the achievement of the maximum potential output from given amounts of factor inputs taking into account physical production relationships (Farrell, 1957). Technical efficiency is most frequently associated with the role of management in the production process. For instance, Liebenstein (1966) has argued that firms may fail to produce on the outer boundary of their production surface due to the structure of preferences of managers and workers, giving rise to variations in the level of "X efficiency". It is also doing a task in the cheapest possible way that is producing a given level of output from the lowest possible combination of inputs or producing the maximum output given the level of inputs

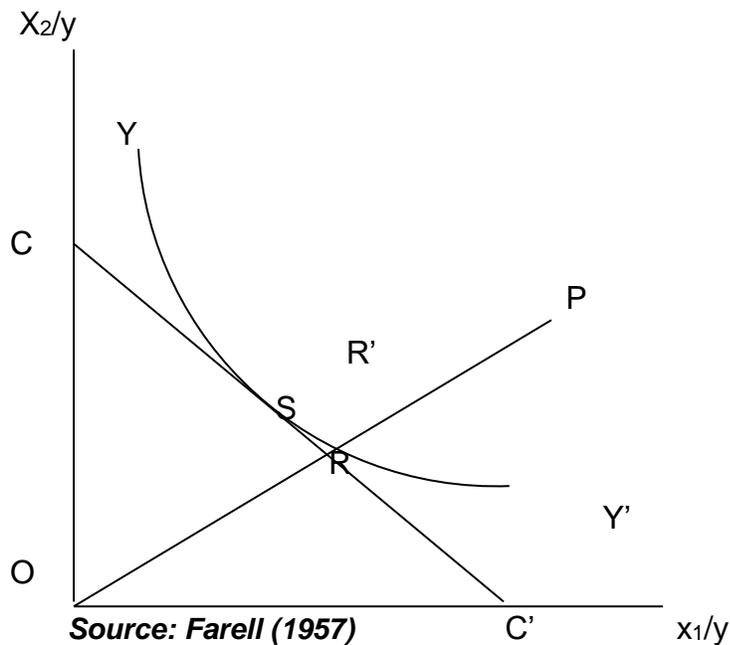
employed. It reflects the ability of firm or decision making unit to attain the maximum output from a given set of input. Thus, a technically efficient production could produce the same output with less of at least one input, or could use the same input to produce more output (Green, 1993).

The level of technical efficiency of a particular firm is characterized by the relationship between observed production and some ideal or potential production. The measurement of firm's specific technical efficiency is based up on deviations of observed output from the best production of efficient frontier. If a firm's actual production point lies on the frontier, it is perfectly efficient. If it lies below the frontiers, then it is technically inefficient.

2.8.2. Allocative Efficiency

Allocative efficiency, or as Farrell called it price efficiency, refers to the ability of a firm to choose the optimal combination of inputs given input prices (Farrell, 1957). If a firm realizes both technical and allocative efficiency, it is then cost efficient (overall efficient). Allocative efficiency measures the skills in achieving the best combination of inputs by taking in to account their relative prices or produces the right mix of outputs given the set of prices (Kumhaker and Hevell, 2000). It reflects the capability of a firm to utilize input in optimal proportion, given their respective prices and the production technology. In other words, allocative efficiency refers to whether inputs for a given level of output and set of input prices are chosen to minimize the cost of production; assuming that the firm being examined is already fully technically efficient. It operates on the least cost expansion path, i.e. the point where the marginal rate of technical substitution is equal to input price ratio. This is very important when one input can be substituted for another in the process of production. The analysis of efficiency carried out by Farrell (1957) can be explained figuratively as shown below:

Figure 2.1: Technical and Allocative Efficiency Measures



The technical set fully described by the unit Isoquant yy' captures the minimum combination of inputs per unit of output needed to produce a unit of output. Thus, under this framework, every package of inputs along the unit Isoquant is considered as technically efficient while any point above and to the right of it, such as point P, defines a technically inefficient producer since the input package that is being used is more than enough to produce a unit of output. Hence, the distance RP along the ray OP measures the technical inefficiency of producing at point P. This distance represents the amount by which all inputs can be reduced without decreasing the amount of output. Geometrically, the technical inefficiency level associated to point P can be expressed by the ratio RP/OP , and therefore, the technical efficiency (TE) of the producer under analysis $(1-RP/OP)$ would be given by the ratio OR/OP .

If information on market prices is available and a particular behavioral objective such as cost minimization is assumed in such a way that the input price ratio is reflected by the slope of the isocost-line CC' , allocative inefficiency can also be desired from the unit isoquant plotted in figure 2.1. In this case, the line segment SR gives the relevant distance, which in relative terms would be the ratio SR/OR . With respect to least cost

combination of inputs given by point R', the above ratio indicates the cost reduction that a producer would be able to reach if it moved from a technically and allocatively efficient one (R'). Therefore, the allocative efficiency (AE) that characterizes the producer at point P is given by the ratio OS/OR.

The product of technical and allocative efficiency measures gives economic Efficiency:

$$EE = TE \times AE = OR/OP \times OS/OR = OS/OP$$

2.8.3. Scale Efficiency

Scale Efficiency often arises from the ability of large firms to allocate fixed costs such as advertising expenses or cost of technology across a greater volume of output. It also shows whether the decision-making units (e.g. banks) operate at the minimum of their long run average cost curve. It focuses on technical efficiency which is the ability of a bank to produce maximal output from a given set of inputs over a certain time period (Adongo et al., 2005). Scale economies are usually measured using data on all banks in the sample rather than just using the data on all of the banks. Scale Economies theoretically apply only to the production possibilities frontiers where firms are fully X-Efficient and minimize costs for every scale of output (Berger and Humphrey, 1994).

2.8.4. Scope Efficiency

Scope efficiency may result from sharing information such as knowledge of customer's habits across products line. It refers to change in product mix related to cost. It occurs when it is more economical to produce two or more products jointly in a single production unit than to produce the products in separate specializing firms. Scope economies could emanate from two sources: i) spreading of fixed cost over an expanded product mixes and ii) cost complementarities in producing different products. Spreading fixed cost occurs, for example, when the fixed capital of a bank or its branches is more fully utilized by issuing many types of deposits to local residents than building separate offices to fulfill the separate demands for transactions accounts, saving accounts, consumer loans and business loans. Such economical spreading of

costs occur to the extent that the production of different types of services requires much the same type of computer, accounting system and other fixed inputs of a branch and there is insufficient local demand to justify a full specialized branch for each of the services. In contrast, cost complementary between deposits and loans occur, for example, when the payment flow information developed in producing deposit services is used to reduce the costs of acquiring credit information and monitoring loans to the same customer. However, there is problem in applying the translog cost/profit function or other multiplicative specification to evaluate scope economies.

2.8.5. X-Efficiency

Leibenstein (1966) was the first to introduce the concept of X-inefficiency. He defined it as the loss at which a bank is operating (deviation from the optimum). X-inefficiency is an intra-firm inefficiency or the deviation from the production efficient frontier which depicts the maximum attainable output for a given level of input. This inefficiency can arise from management practice and the environment. X-inefficiency reflects the differences in managerial ability to control cost and/or maximize profits but not suboptimal economies of scale or scope. It has been linked to managerial quality. Empirical X-inefficiency is a measure of how banks utilize their inputs to produce a given level of output. Berger et. al., (1993) describe X-inefficiency as a variance from the efficient frontiers set by the best practice or benchmark firm. It incorporates two components, i.e. technical and allocative inefficiencies (Allen & Rai, 1996). According to Farrell (1957), technical inefficiency occurs due to sub optimal usage of input leading to waste, while allocative inefficiencies arise from inappropriate mix or composition of inputs using inefficient business process. Both inefficiencies are attributed to employee, management or environment factors.

Despite the lack of harmony across all methods, it seems clear that x-efficiency differences are much more important than scale and scope efficiencies in banking. Most of the studies find that average cost X-inefficiencies are on the order of 20% higher for virtually all size classes of banks as opposed to scale inefficiencies. Scope inefficiencies

are difficult to measure but also appear to account for 5% or less of costs (Berger and Humphrey, 1994; Berger et. al., 1997).

Duality concepts have the best economic foundation for analyzing the efficiency of banks for they are based on economic optimization in reaction to market price and competition. The following sections will discuss cost and profit x-efficiency based on the duality concept.

2.8.6. Cost-Efficiency

Cost efficiency gives a measure of how close a bank's cost is to what the best practice bank's cost would be for producing the same output bundle under the same conditions (environment, rule and regulation). It is derived from a cost function in which variable cost depends on the prices of variable inputs, the quantities of variable outputs and any fixed inputs or outputs, environmental factors and random error as well as efficiency. Such cost function may be written as:

$$C = c(w, y) + \mu_c + v_c \text{ -----(1)}$$

Where, C measures variable costs, w is the vector of price of variable inputs, y is the vector of quantities of variable outputs, μ_c denotes inefficiency factor that may raise costs above the best-practice level, and v_c denotes the random error that incorporates measurement error and luck that may temporarily give banks high or low costs. The inefficiency factor, μ_c , incorporates both allocative inefficiencies (from failing to react optimally to relative prices of inputs, w) and technical inefficiencies (from employing too much of inputs to produce y). To simplify the measurement of efficiency, the inefficiency and random terms μ_c and v_c are assumed to be multiplicatively separable from the rest of the cost function, and both sides of equation 1 can be represented in natural logs as follows:

$$\ln C = \ln f(w, y) + \mu_c + v_c \text{ -----(2)}$$

Where, f denote some functional form. The term, $\mu_c + v_c$ is treated as various X-inefficiency and composite error terms measurement.

The cost efficiency of bank 'b' is defined as estimated cost needed to produce bank b's output vector if the bank were as efficient as the best practice bank in the sample facing the same exogenous variable (w, y) divided by the actual cost of bank b, adjusted for random error. That is

$$\text{costEff}^b = \frac{C^{\min}}{C^b} = \frac{\exp\left[f\left(w^b, y^b, z^b, v^b\right)\right] \exp\left[\ln u_c^{\min}\right]}{\exp\left[f\left(w^b, y^b, z^b, v^b\right)\right] \exp\left[\ln u_c^b\right]} = \frac{u_c^{\min}}{u_c^b} \text{----- (3)}$$

When u_c^{\min} is the minimum u_c^b across all banks in the sample.

The cost efficiency ratio may be thought of as the proportion of cost or resources that are used efficiently. Cost efficiency ranges over (0, 1), and equals one for the best practice firm with in the observed data.

2.8.7. Standard Profit Efficiency

Standard profit efficiency measures how close a bank is to producing the maximum possible profit given a particular level of input prices and output prices (and other variables). In contrast to the cost function, the standard profit function specifies variable profits in place of variable costs and takes variable output prices as given rather than holding all output quantities statistically fixed at their observed possibly inefficient levels. That is, the profit dependent variable allows for consideration of revenues that can be earned by varying outputs as well as inputs. Output prices are taken as exogenous, allowing for inefficiencies in the choice of outputs when responding to these prices.

The standard profit function, in log form, is

$$\ln(\Pi + \theta) = \ln f(w, p) + \mu_\pi + v_\pi \text{----- (4)}$$

Where Π is the variable profit of the firm, which includes all the interest and non interest income earned on the variable output minus variable costs, C, used in the cost function; θ is a constant added to every firm's profit so that the natural log takes a positive number. It is defined as $|\Pi^{\min}| + 1$; p is the vector of prices of the variable output; v_π represents random error; and μ_π represents inefficiency that reduces profits.

Standard profit efficiency is defined as the ratio of the predicted actual profits to the predicted maximum profit that could be earned if the considered bank was efficient as

the best bank in the sample, net of random error, or the proportion of maximum profits that are actually earned.

$$Std \Pi Eff^b = \frac{\Pi^b}{\Pi^{\max}} = \frac{\left\{ \exp \left[f \left(w^b, p^b, z^b, v^b \right) \right] \right\} \exp \left[\ln u_{\pi}^b \right] - \theta}{\left\{ \exp \left[f \left(w^b, p^b, z^b, v^b \right) \right] \right\} \exp \left[\ln u_{\pi}^{\max} \right] - \theta} \text{-----}(5)$$

Where, u_{π}^{\max} is the maximum value of u_{π}^b in the sample

Standard profit efficiency is the proportion of maximum profits that are earned. The profit inefficiency is due to excessive costs or deficient revenues or both; the firm is losing the profit it could be earning. Similar to the cost efficiency ratio, the profit efficiency ratio equals one for a best-practice firm that maximizes profits for its given conditions within the observed data. Unlike cost efficiency, however, profit efficiency can be negative since firms can throw away more than 100% of their potential profits.

Profit efficiency concept is superior to cost efficiency concept for evaluating the overall performance of firms. This is because profit efficiency accounts for errors on the output side as well as those on input side. Besides, profit efficiency is based on the more accepted economic goal of profit maximization, which requires that the same amount of managerial attention be paid to raising a marginal dollar of revenues as to reduce a marginal dollar of costs.

Moreover, profit efficiency is based on comparison with the best practice point of profit maximization within the data set, where as cost efficiency evaluates performance-holding output constant at its current level, which generally will not correspond to an optimum profit. A firm that is relatively cost efficient at its current output may or may not be cost efficient at its optimal output which typically involves a different scale and mix of outputs.

Thus, standard profit efficiency may take better account of cost inefficiency than the cost efficiency measure itself, since standard profit efficiency embodies the cost inefficiency deviations from the optimal point.

2.8.8. Alternative Profit Efficiency

Alternative profit efficiency measures how close a bank comes to earning maximum profits given its output levels rather than its output prices. It is helpful when some of the assumptions underlying cost and standard profit efficiency are not met. The alternative profit function employs the same dependent variable as the standard profit function and the same exogenous variable as the cost function. Thus, instead of counting deviations from optimal output as inefficiency, as in the standard profit function, variable output is constant as in the cost function while output prices are free to vary and affect profits. The alternative profit function in log form is:

$$\ln(\Pi + \theta) = \ln f(w, y) + \mu_{a\pi} + v_{a\pi} \text{ ----- (6)}$$

This is identical to the standard profit function eqn. (4) except that y replaces p in the function, f , yielding different values from the inefficiency and random error terms, $\mu_{a\pi}$ and $v_{a\pi}$ respectively.

As with standard profit efficiency, alternative profit efficiency is given by the ratio of predicted actual profit to the predicted maximum profits for a best practice bank.

$$Alt \Pi Eff = \frac{\Pi_a^b}{\Pi_a^{\max}} = \frac{\left\{ \exp \left[f \left(w^b, y^b \right) \right] \exp \left[\ln u_{a\pi}^b \right] \right\} - \theta}{\left\{ \exp \left[f \left(w^b, y^b \right) \right] \exp \left[\ln u_{a\pi}^{\max} \right] \right\} - \theta} \text{ ----- (7)}$$

Here, efficiency values are allowed to vary in an important way with output prices, but errors in choosing output quantities do not affect alternative profit except through the point of evaluation $f(w^b, y^b)$ to the extent that the best practice bank is not operating at the same (w, y) as bank b .

Standard profit efficiency and cost efficiency would appropriately measure how well the firm was producing outputs and employing inputs relative to best practice firms.

2.8.9. Summary

IO is concerned with the structure of industries in the economy and the behavior of firms and individuals in these industries. This theory has not only grown within its field, but also in others, such as business management especially in the areas of strategic management. The SCP paradigm appears to be the most pertinent and long time used approach to assess industry structure studies. It basically attempts to look at the market structure of industries and determine their conduct and performances. Various theories that challenged the SCP are also witnessed including the efficient hypothesis, contestable market theory and quiet life hypothesis etc. Even in recent period, a reverse approach to look at the structure and performance of a given industry by observing the conduct of firms has emerged. In other words, the new wave of research like NEIO set out to understand the institutional details of particular industries and use this knowledge to test specific hypotheses about specific firm behavior. Nevertheless, NEIO appears to be the alternate paradigm for imperfect market analysis than the one totally revoking the methodological approach of the SCP, in fact with friction between the two paradigms. Some authors like Bhuyan (2014) has compared these two methods of analyzing market power and concluded that the debate over the use of the SCP approach versus the use of the NEIO approach to analyze market power will continue. The debate however is not only among the aforesaid paradigms but still there is unresolved inconclusiveness among the structural theorists like SCP and efficient market theorists.

CHAPTER THREE

EMPIRICAL EVIDENCES AND CONCEPTUAL FRAMEWORK

3.1. Introduction

The SCP framework, which originated from the works of Mason (1939) and Bain (1951) as methods of analyzing industry concentration, has made its focus in the manufacturing sector (Sathye, 2005). It was later (in 1961) introduced into the banking industry following the work of (Schweiger and Mcgee; Atemnken and Joseph, 1999). It has, therefore, remained as a commonly used model to test the casual link between industry concentration and bank performance (Berger and Hannan, 1998). Consequently, several studies intended to explore the link between market power, efficiency and performance of banks were conducted in several countries (Claeys and Vennet, 2008, Deltuvaite et.el, 2007, Flamini et.el, 2009, to mention but only a few). In other words, the studies focus mainly relied on testing the validity of the basic proposition of the traditional SCP paradigm that the industry concentration lowers the cost of collusion between firms and results in higher than normal profits. The communalities among the studies tend to encircle around testing the two contrasting market paradigms, the SCP and the efficient market hypothesis. The two competing views are based on the concept of market power, structure conduct, performance and relative market power (RMP) on one hand, and efficiency-based explanations on the other (Chortareas, 2009). The market power hypotheses are based on the premise that banks with a higher market share might earn superior profits due to their market power (Shepherd, 1986). A disintegration of concepts has also been observed in the efficient structure proposition. The relative X-efficiency (ESX) hypothesis states that more X-efficient banks (due to better management or better technology) have lower costs of operation, higher profits and bigger market shares which may result in greater concentration (Demsetz, 1998). Therefore, banks operating at optimal economies of scale will better reduce their unit costs which result in higher unit profits. This in turn may be translated to gain in market share and/or greater concentration. Therefore, concentration remains the result of efficiency rather than market power as presumed in market power theories. Nevertheless, the studies result shows a mixed and inconclusive

empirical evidence to point out the supremacy of one model over the other (Gilbert, 1984; Goddard et al., 2001).

3.2. Evidences on a Positive Link between Structure and Performance

The theory surrounding the SCP hypothesis is that certain industry structures are suitable to monopolistic conduct allowing firms to augment prices beyond marginal costs thereby making unusual profits (Bain, 1951). The direct effect of this conduct is a reduced competition and imperfect market structure (Shepherd, 1985). SCP pointed out that changes in industry concentration may have a positive pressure on a firm's financial performance (Goldberg and Rai, 1996). Therefore, the resultant positive link between industry concentration and performance emanates from the anti-competitive behavior of firms with large market share (Berger and Hannan, 1998).

Empirical studies also put forward a positive and statistically significant connection among market structure and bank performance. The basic conclusion from the evidences appears that more concentrated markets attract less degree of competition. The SCP hypothesis, therefore, reigns in situations where the impact of market concentration was found to be significantly positively related to firms' profitability. There are many empirical studies of SCP relationships in the banking industry that support this hypothesis. For instance, Gilbert (1984) survey on 44 studies depicted that thirty-two of the studies were in line with the fact that market concentration significantly and positively related with bank performance. Moreover, a positive link between bank concentration and profitability measure (ROE) was found by Short (1979) in a study which was based on a sample of banks from Canada, Western Europe and Japan. Similarly, Moore (1998) explored the casual link between concentration ratio and profitability using both univariate and multivariate regression tests and found that the bank concentration had positively affected performance. He has added technology variable to the model and found that the positive relationship doesn't altered even when technology variable varies. In addition, the results by Berger and Hannan (1989), and

Pilloff and Rhoades (2002) are in line with the SCP predictions of a significant effect of industry concentration on performances.

3.3. Studies Supporting the Efficient Market Hypothesis

The SCP supporters' empirical test is challenged by a thought from the efficient market theorists and mainly of Demsetz (1973) and Peltzman (1977). They argue that banks are able to maximize profits and gain market share by being efficient. Consequently, market concentration increases following a rise in market share, which is a gain from the superior efficiency of the leading banks (Simrlock 1985). Smirlock (1985) and Evanoff and Fortier (1988) attempted to demonstrate that a relationship exists between bank market share and bank profitability but not between concentration and profitability. As discussed in previous sections, Berger and Hannan (1998) has laid down a methodology to assess impact of such relationship (efficiency- profitability) including direct measures of inefficiencies (X- and scale inefficiencies). The addition of two efficiency measures therefore has resulted in four competing hypotheses. Two market power theories(SCP, RMP) which are based on industry concentration and market share measures and two efficiency theories(ESX and ESS) that are based on managerial and scale efficiency elements. The study of Berger and Hannan(1998) finds that a positive and statistically significant relationship exists between the market share and X-efficiency variables with bank profits. More recent studies (Seelanatha, 2010; Prasad and Radhe, 2011) have followed the Berger and Hannan methodology by explicitly including the efficiency measures in their estimations.

3.4. Methodology and Approaches

The SCP approach uses a model that can examine whether a highly concentrated market causes collusive behavior among large banks and whether it improves market performance. Usually literature applied a multiple linear regression model to test the SCP hypotheses (Berger et.al,2003). Studies use the formulation shown in equation 1 to postulate statistically the performance of the profit concentration relationship.

$$P_i = f(CR, X_i) \text{ ----- (3.1)}$$

Where P_i is some measure of performance of the i th bank, CR is the banking industry's index of concentration and X_i denotes a set of control variables that are firm specific or industry specific characteristic.

While a positive correlation between banks' performance and market concentration was frequently found, the interpretation of this result, and hence the policy implication, varied among the studies. Bain (1956) interpreted it as support for the SCP hypothesis, which asserts that banks in a concentrated market are more likely to engage in some form of non-competitive behavior such as collusion, consequently setting less favorable prices to customers and earning higher profits. Others (Demetsz, 1973) viewed it as support for the ES hypothesis, increase in market share and size of big firms is result of efficiency than concentration. Therefore, such ambiguity in interpreting the result of same regression result might be a reflection of the significant limitation of the approach.

To resolve such ambiguities, Simrlock (1985) revisited the above model in his study of concentration and profitability. The approach used is to incorporate both market share and concentration measures so as to test the relationship between concentration and profitability. Most importantly, the model provides strong emphasis on testing the relationship between market share and bank performance. The empirical model is constructed as follows:

$$P_i = f(b_1MS, b_2CR, MSCR + Z) \text{ (3.2)}$$

where P_i represents the performance, MS is the market share of the bank, CR is the concentration ratio, $MSCR$ is MS multiplied by CR (representing an interaction term), and Z is a vector of additional control variables.

The above model is very useful in evaluating the two competing hypotheses. If $b_1 > 0$ and $b_2 = 0$, the efficient structure hypothesis is supported. If $b_1 = 0$ and $b_2 > 0$, the profits are not affected by market share but are influenced by market concentration, supporting the SCP hypothesis. If both b_1 and b_2 are greater than zero, then the results could be

subject to different interpretations. The supporters of the SCP hypothesis would view the results as showing *that 'all firms in concentrated markets earn monopoly rents from collusion.'* (Smirlock, 1985, p.74). The monopoly rent from concentration will go to the largest firms not the most efficient firms. The supporters of the ES hypothesis would see the results as evidence *"that leading firms are more efficient than their rivals"*(Smirlock, 1985, p.74) In order to interpret the findings correctly, therefore an additional variable is introduced (MSCR) as an additional regressor. If the coefficient for MSCR is positive, then collusion is present. However, if it is less than zero, then collusion is not present. Still however, the controversies related to the interpretation of similar regression results is far to get a final solution (Berger et.al 2003). For instance, a positive coefficient estimate for market share along with an insignificant value for concentration is interpreted as a support for market power hypothesis (Shepherd (1986), Rhoades (1985) and Kurtz and Rhoades (1991). Same result however is looked to support the efficiency hypothesis (Smirlock (1985) and Evanoff and Fortier (1988)) Other authors construe a positive link between market share and profitability favors the efficiency hypothesis in industrial organization (such as Gale and Branch (1982), and Stevens (1990)).

Berger and Hannan (1998) tackled the problem by explicitly incorporating two efficiency indicators which measure the X-efficiency and scale efficiency of banks as explanatory variables in the regression equations. In addition, two market structure indicators, which are proxied by banks' market concentration and market share, are included in their model. Four testable hypotheses are specified (instead of the usual two), SCP, RMP, ESX and ESS. The traditional SCP hypothesis remains unchanged, i.e. higher profits are the result of anti-competitive price settings in concentrated markets (Bain, 1951). A related hypothesis is the relative market power hypothesis (RMP) which claims that firms with large market shares are able to exercise market power to earn higher profits. The difference between SCP and RMP is that the latter need not occur in concentrated markets. The remaining two hypotheses relate to the efficient-structure hypothesis which posits that the larger market share is the result of efficient operations of the firms. Efficiency, however, is broken into two components. Under the X-efficiency hypothesis

(ESX), the firms with superior management or production processes operate at lower costs and subsequently reap higher profits. The resulting higher market shares may also lead to higher market concentration. The scale-efficiency hypothesis (ESS) states that firms have similar production and management technology but operate at different levels of economies of scale. Firms operating at optimal economies of scale will have the lowest costs and the resulting higher profits will lead to higher market concentrations.

Both versions of the efficient- structure hypothesis provide an alternative explanation for the positive relationship between profit and market structure. To determine which of the four hypotheses is valid, Berger and Hannan (1998) used the following model:

$$P_i = f(X-EFF_i, S-EFF_i, CONC_m, MS_i, Z_i) + e_i \dots\dots\dots(3.3)$$

where P, is a measure of performance, X-EFF_i is a measure of X-efficiency, reflecting the ability of banks to produce a given bundle of output at minimum cost through superior management or technology, S-EFF_i is a measure of scale-efficiency, reflecting the ability of banks to produce at optimal output levels (economies of scale), given similar production and management technology, CONC_m is a measure of concentration in market m, MS_i is market share of bank i in market m, Z_i is a set of control variables for each bank i, and e_i is an error variable for each bank i.

After resolving such interpretation difference through methodological innovation, the succeeding research has evolved in several directions. Studies using the SCP approach are now incorporating several variables from the environment such as bank risks, regulation, the quality of banking services, and the ownership and size of banks (Berger et al. 2003). Other studies have applied non-structural approach basing on factors firm specific factors to find out the situation in the market structure. For instance, Panzar and Rosse applied H-statistics to observe the competition situation of the banking industry (Casu and Girardone,2006). Others use the Lerner Index of monopoly power (Guerrero et. al., 2005) and recently the Boone Indicator is also used in the competition analysis.

The majority of studies, however, still rely on tests of market power and/or efficiency as analytical models of bank competition (the reviews of Gilbert and Zaretzky, 2003; Northcott 2004, Punt and Rooij, 2001; Vennet, 2002; Hahn, 2005 and Yu and Neus 2005, etc). More recent studies are also being conducted in Africa (Nabieu, 2013, Simbanegavi et.al, 2012) and others. Nevertheless, the theme of the studies remained to explore the role of different factors in explaining the competitive conditions in banking markets. The difference appears to be between the structuralist that claim to begin from the industry concentration to study the conduct of firms as well as others who opt to start from the conduct of firms to study the industry structure.

3.5. Critics on the Approach /Methodologies

The SCP model has been challenged on both grounds, theoretical and empirical. The criticism on SCP originated against background of mixed empirical evidences questioning the robustness of the model (Molyneux et.el., 1996).The lack of consistent results has led some researchers to argue that the literature contains too many inconsistencies and contradictions to establish a satisfactory SCP relationship in banking (Mooslechner and Schnitzer, 1994). More specifically, in banking study, the model is challenged by the difficulty to define a meaningful market area and set a reasonable measure of industry concentration. In addition, setting performance standard is problematic as banks are multi-product firms. Overall, the paradigm has several criticisms which can be classified into three categories, i.e. those related to measurement, econometric and interpretation problems.

Concerning the interpretation problems, a theoretical challenge was initially set by the efficiency theorists, Demsetz (1973) and later by Berger (1995). They hypothesize that unlike the claim of the SCP, the large market share which causes a high level of industry concentration emanates from superior efficiency performances rather than a lower level of competition. As discussed in the previous section, the controversy over the interpretation is commonly cited as the 'market power' versus 'efficiency' debate. Besides such debate, Molyneux (1999) argues that due to increase in type and number

of financial service providers, concentration in the banking markets is becoming less and less relevant in terms of competition policy. Others, however, (e.g. Dermine, 2002) emphasized that in certain areas of banking, the dominance of banks has not yet been broken and hence concentration remains a big challenge need to be addressed.

With regard to measurement problems, originally the debate focused on the relative merits of alternative accounting measures of profitability. More fundamentally, it has been questioned whether accounting measures can be used at all as proxies for market power (price over marginal cost) (Mullineux and Sinclair, 2000). If this is not the case market power has to be estimated since marginal cost is not observable. Other arguments are against the use of concentration as a measure of the level of market structure. For instance, Mullineux and Sinclair (2000) argue that even though concentration may result in higher prices, lowering the demand for services does not necessarily cause higher profits performance for a highly concentrated banking sector. The SCP paradigm assumes that each bank profits from high prices caused by collusion among market participants. Thus, profitability depends to some extent on concentration (Bain, 1956). The concentration ratios, the most frequently employed in empirical analyses Bikker (2002a) are:

- The CR_k index, which sums the market shares held by the k largest banks, place equal emphasis on leading banks and ignoring the rest;
- The Herfindhal index, which places greater emphasis on larger market players and allows for each bank, adopts a calculation method that automatically excludes the competitive conduct of banks as a diminishing factor.

Regarding econometric problems, a limitation of this paradigm is that it assumes the causation to be unidirectional (Goldberg and Rai, 1996). For example, market performance can have feedback effects into market structure. In addition, the linkage between structure and conduct remained uncertain and the direction of causality is also problematic. In addition, there appears a dispute over the structure-performance relationship due to the possibility of a non-linear relationship. Jackson (1997) has found

a negative relationship between concentration and deposit rates in markets with low concentration. The negative correlation ceases to exist in middle levels of concentration and becomes positive in highly concentrated markets. This suggests the existence of a U-shaped relationship between market concentration and prices. The non-linear nature of the profit (price)–concentration relationship has been cited by Berger and Hannan (1992) (for U.S. markets) as well as (Goldberg and Rai, 1996).

Other critics that include the empirical studies employing the SCP model fail to allow for banks' market conduct explicitly (Bikker and Haaf ,2002a). Instead, in effect, they treat it as being determined by structure. In addition, empirical studies often fail to consider factors that may be important in terms of assessing an actual relationship between structure and performance. For instance, Gilbert (1984) argues that a serious shortcoming of earlier SCP studies in the United States is that they ignore the impact of regulations on concentration and performance.

3.6. Variables Used

3.6.1. Performance

The literature on bank performance has closely tied bank performance with both price and profitability measures. The price measures includes net interest margin, spread and profit measures consists of Return on Assets, Return on Equity and Net interest margin. However, both measures rely on the accounting measures. This is because the data sources of the studies are mainly of publicly available bank specific data, which are reported following certain accounting procedures and rules. Adjustment to economic variables might be difficult due to unavailability of data.

Regarding the price-profit performance measure debate, some scholars argue that bank profit is an appropriate measure of bank performance and criticize price measures as poor measures of bank performance (Civelec and Al-Almi,1991). He argued that, the use profit measure helps to capture the banks major objective, profit maximization, by including both cost and revenue elements.

On the other front, some studies prefer to measure performance in terms of bank prices rather than bank profitability (Smirlock, 1985). This is because of the use of price-concentration relationship enable to observe the noncompetitive behavior of the industry in relation to high levels of concentration. In other words, the price effect implies the market discrimination power of the leading firm i.e. whether concentration has resulted in lower interest rates given to depositors and/or higher lending rates to borrowers (Chirwa,2001). However, such argument is criticized for the fact that price measures of performance create problems of cross subsidization of multi-product firm like banks (Molynex and Forbes, 1995). Therefore, the profit measure is the preferred performance indicator in banking studies. The accounting profitability measures mainly of the ROA provide indications about how the bank's assets are effectively utilized to generate profits (Chirwa,2001). However, other measures such as return on equity used by Short (1979) and Bourke (1989) or profits margin are generally utilized.

3.6.2. Efficiency

Efficiency can be measured using parametric and non-parametric techniques. The applications of non-parametric techniques exceeds the usage of the parametric ones (Berger and Humphrey,1997).

The Data Envelopment Analysis (DEA) models are the widely used non-parametric techniques among others. The DEA in banks are estimated using the assumption of both Constant Return to Scale (CRS) and Variable Returns to Scale (VRS). However, there is a controversy as to rely on which of the two approaches. Supporters of VRS argue that CRS is only appropriate when all firms are operating at an optimal scale (Fiorentino et al., 2006). Therefore, it might be unrelastic to expect perfection in bank operation all the time. Nevertheless, other studies argue in favor of CRS because the CRS allows the comparison between small and large banks (Miller and Noulas,1997).

Studies in banking obtain efficiency score estimates under the input-oriented approach. This is most likely due to the fact that banks output can possibly determined considering

the level of its input. For instance, a bank mobilizing deposits can generate more loans. In addition, it's assumed that banks have higher control over inputs rather than outputs. There are also some studies that adopt the output-oriented approach (Ataullah and Le, 2006). The input-oriented and output-oriented measures always provide the same value under CRS. There might be variation when they are computed under VRS assumption (Coelli et al., 2005). Therefore, in many instances, the choice of orientation has only a limited influence upon the DUM scores obtained (Coelli et. el, 1999).

With regard to the approach used, Berger and Humphrey (1997) argue that the intermediation approach is the one favored in the literature. The production approach is criticized for the difficulties in collecting the detailed transaction flow information required in the production approach. As a result, the intermediation approach is the one favored in the literature.

The commonly used inputs in DEA computation are deposits, fixed assets and personnel (Casu and Girardone, 2004). However, some studies use branches (Chen, 2001), loan loss provisions (Drake et al., 2003) and equity (Sturm and Williams, 2004) as additional or alternative inputs. Several studies use two outputs, usually, loans and other earning assets (Casu and Molyneux, 2003). Canhoto and Dermine (2003) use the number of branches as an additional output under the assumption that it represents an additional value for retail customers. Finally, recent studies include non-interest income or off-balance-sheet items as additional outputs (Weil, 2004).

3.6.3. Concentration

The Herfindahl-Hirschman Index (HHI) is one of the commonly used measure of bank concentration in both the theoretical literature and empirical studies. In addition, it often provides as a yardstick to appraise the application of other concentration indices (Bikker,2002a). Similarly, the k-bank concentration ratio is comparatively used to measure the level of industry concentration (Molyneux et al. ,1996). As reported in Molyneux, 37 out of 73 US SCP of the banking sector, 37 studies have used the 3-bank

deposit concentration measure, whereas, 18 studies employed the Herfindahl–Hirschman Index (HHI). On the other hand, for highly concentrated market, some studies also used a single bank concentration ratio (Beighley and McCall, 1975 and Kaufoman,). There are also instances on the usage of two-bank concentration ratio (Ware ,1972). However, as stated above the three-bank concentration ratio based on the deposit market has been the most widely used (Edwards and Heggestad, 1973). The four-bank ratio also extensively employed due to its merit of addressing the problem of data confidentiality and also its high weight to provide weight on smallness which is an attribute of some industry structures (Kinsella, 1981).

An exhaustive study mixed use of both Herfindahl- Hirschman index and the k- bank concentration ratios, for $k = 3, 5$ and 10 is also done by Bikker and Haaf (2002a). He has computed the indices based on market shares in terms of total assets of banks taking 20 countries. He has concluded that the differences across countries in the HHI relate most profoundly to the variation in the number of banks. Furthermore, the variation in k-bank concentration ration is mainly a result of the difference in the skewness of the bank-size distribution rather than the number of banks. Overall, apart from a few exceptions, the rankings of countries based on the various indices have witnessed homogeneity for the various indices considered. Therefore, the indices are practically tested for their appropriateness to measure bank concentration. Astonishingly, the result in the rankings of the HHI and the 3-bank concentration ratio bear the closest similarity (with a correlation of 0.98), while the ranking based on the 5 and the 10-bank concentration ratios slight differ more from the HHI (with, respective, correlations of 0.94 and 0.86). This examination provided an empirical insight on the long stayed concern in the literature regarding the selectiveness of the k bank indices (only considers big banks) as compared to the HHI, which incorporates all banks in its market share computation.

3.6.4. Regulations

Literature is not also conclusive on the impact of regulation on bank performance. Some authors consider that effective regulation of bank entry can promote stability and enhances prudent risk behavior (Keeley, 1990). Others consider regulation as a barrier to hinder competition therefore allowing for inefficiencies (Shleifer and Vishny, 1998). Therefore, countries with greater regulatory restrictions on bank activities are associated with lower banking sector efficiency (Barth, et.al, 2001). Worsening the scenario, regulations like restrictions on bank entry are associated with greater bank fragility (Allne and Gale, 2004) and lower bank margins (Demirgüc-Kunt et.al, 2003).

The usually used variable to mediate the effect of regulation on bank performance is the capital level. However, there appears variation on the empirical result. Those supporting its positive impact justify its service as a buffer against losses and hence failure (Dewatripont and Tirole, 1994a). On the other front, negative news related to capital may cause banks to reduce lending Brealey (2001) and may encourage banks to take more credit risk.

Studies also consider bank ownership type as a variable to represent regulatory freedom. Claessens and Laeven (2003) find that banking systems with greater foreign bank entry, fewer entry and activity restrictions are more competitive. LaPorta et.al., (2002) examine the extent of government ownership to represent the degree of regulatory involvement. Claessens. et. al., (2001) show in a cross-country study that foreign bank entry makes domestic banking systems more efficient by reducing margins.

On the other front, studies consider the degree of liberalization of the banking system. The impact of financial deregulation is typically assessed either through a dummy variable Salas and Saurina (2003) or simply examining the behavior of banks during periods of financial deregulation (Das and Ghosh, 2006). The findings indicate that the impact of deregulation on bank behavior depends, among others, on the state of the banking system and differs significantly across bank ownership.

3.6.5. Control Variables

Studies have used either or all of bank specific, industry specific and macroeconomic related factors to explain bank performance (Nissanke and Aryeetey, 2006). Panayiotis (2005) showed that bank profitability is a function of internal and external factors. Internal factors include bank-specific, while external factors include both industry-specific and macroeconomic factors. According to this literature, there are six standard key bank-specific indicators that are widely used to study banks. These include profitability, capital adequacy, asset quality, operational efficiency and growth in bank assets and earnings. However, the most widely used variables and framework is the CAMEL rating framework (Barr, 2002). Barr (2002) showed that CAMEL rating criteria has become a concise tool for examiners as well as regulators and found that there is a significant relationship between CAMEL ratings and efficiency scores.

Another strand of literature emphasizes the importance of industry and macroeconomic variables in explaining performance heterogeneities across banks. This literature is based on the structure-conduct-performance (SCP) paradigm and is also applicable to contestable markets, firm-level efficiency, and the roles of ownership and governance in explaining bank performance (Berger, 1995; Berger and Humphrey, 1997; Bikker and Hu, 2002; Goddard et al., 2004). In terms of variables used, industry-specific factors include ownership, bank concentration index, financial deepening. In addition, bank size and economies of scale are used as industry specific variables. Bank size is measured as banks total deposits (assets) or as an average measure based on total assets takes into account differences brought about by size such as economies of scale (Molyneux and Forbes. 1995). Conversely, Evanoff and Fortier (1988) established that any positive influence on profits from economies of scale may be partially offset by greater ability to diversify assets resulting in a lower risk and a lower required return. Therefore, the empirical results on the performance of bank size variables are mixed. The macroeconomic factors include interest rate, interest rate spread, inflation and levels of economic growth represented through either GDP or GDP per-capita (Panayiotis, 2005).

3.7. Studies by Region

From the side of developed economies, SCP theories have been tested widely alongside its counterpart, the efficiency theory for the US and European banking sectors. Recently, similar studies are also moving in the developing nations' banking environment as well. The studies have two variants in terms of region classification: some studies focus on single countries while others are done considering cross-countries. The literature focusing on single country include, for instance, Colombia (Barajas et al.,1999), Malaysia (Guru et al., 1999), Italy (Girardone et. al.. 2004), UK (Kosmidou et al., 2005), Korea (Park and Weber, 2006), etc.

Some other studies consider a large number of countries and most of them use extensive number of countries under limited period of observations. For example, Beck et al. (2003) explored the link between industry concentration and performance for 364 banks operating in 8 Central and Eastern European Countries for the period 1998 to 2001. The result rejected the SCP theory, but accepted one of the market power variant, the Relative Market Power hypothesis. In the same manner, Gonzalez (2005) investigates the efficiency- structure of the banking sectors considering 69 countries over 1996-2002, hence, having around 2,592 observations. The study's findings support the efficient structure hypothesis and acknowledge bank regulation, supervision, financial structure and financial development are statistically significant relationship with bank profitability. Claessens et al. (2001) study considers 80 countries from 1988 to 1995 and explores the variation in profits, net interest margins, overhead, and taxes between different bank ownership types (domestic and foreign banks).

A separate evaluation on specific countries shows that results are mixed. For instance, studies done at the US banking sector has resulted in contrasting outcome among the SCP and the ES hypotheses. For example, as discussed before, Smirlock (1985) rejects the SCP by exploring a statistically positive relationship between market share and profitability and an statically insignificant relationship between concentration and profitability. The result supports the argument that banks in the US are more profitable

because of their high efficiency performances. Rhoades (1985), on the other hand, finds a strong relationship between profitability and concentration as well as also between market share and profitability in the US. He suggests that a positive relationship between market share and profitability does not reflect product differentiation advantages such as allowing banks to charge higher prices. He thus accepts both the SCP and RMP hypotheses although allocates more importance to the latter one due to a higher coefficient. Evanoff and Fortier (1988) compare the collusion and efficiency hypotheses in the US. They find a strong relationship between market share and profitability. They conclude that the concentration index is insignificant, thus, rejecting the SCP. However, having found a positive relationship between market share and profitability they accept the RMP hypotheses. They explain this result by stating that there is some evidence supporting the efficiency hypothesis since controlling for market growth, they found a negative result between market share and profitability. Berger and Hannan (1989) analyzed the relationship between concentration and price through a direct measure of profitability for the deposit market in the US. Moreover, they use three types of concentration ratios to model for the concentration index. They find a negative relationship between concentration and price, which is indicative of accepting the SCP explained by banks paying lower deposit rates to consumers. In a recent study on US banking, Tregenna (2006) analyzed the effects of structure on profitability for the period of 1994-2005. Bank level panel data are used to test the effects of concentration, market power, bank size and operational efficiency on profitability. The author observed that efficiency is a strong determinant of profitability, whereas there was robust evidence for positive concentration-profitability relation.

There are a number of studies focusing on Europe analyzing the SCP hypotheses. Bourke (1989) analyzes a set of European countries and although he finds a positive relationship between the concentration index and profitability, the explanatory variable of the concentration index is too small. Molyneux and Forbes (1995) test the SCP and RMP hypotheses for a group of European countries and find insignificant values for the concentration index thus rejecting the RMP and accepting the SCP hypothesis. Molyneux and Thornton (1992) also study a group of European countries and find

evidence supporting the SCP. Nevertheless, they did not test the RMP hypothesis. Results in Molyneux (1993) study in selected countries like Portugal, Spain, Sweden, United Kingdom and Turkey appear in line with the SCP model. Vennet (1993) also accepted the SCP hypothesis in Portugal, Spain, Ireland and Belgium.

Goldberg and Rai's (1996) study accepts the relative market power rather than the SCP hypothesis for some European countries. Moreover, their study also supports the efficient market hypothesis establishing a positive relationship with performance. A study in Spain by Maudos (1998) test finds a similar result supporting both the efficiency and relative market power hypothesis. A test on the aforementioned models by Punt and Van Rooij (2001) for a group of European countries overwhelmingly supports the X-efficiency version of the efficiency theory and claims for nonexistence of collusion behavior among banks in Europe. Unlike the above study's findings, Vennet (2002) research findings on a group of European countries partially support the SCP and convincingly the X-efficiency model. In addition, Hahn (2005) tests the structure and efficiency theories for Austrian banks and finds empirical evidence that supports the SCP. Some studies also find a result supporting both the efficiency and SCP theories. For instance, Yu and Neus (2005) find evidence supporting both efficient and SCP hypotheses for the German banking sector. Therefore, the study results in previous research seems to vary in their conclusions. Studies done at European banking, for instance, show that the level of market power in the European banking industry is considerable (Molyneux et al., 1994; Molyneux and Forbes, 1995; Bandt and Davis, 2000). On the other hand, others witness the reduction in collusive behavior in Europe. For example, Neven and Roller (1999) taking seven European countries (France, Denmark, Germany, Spain, UK, Belgium and Netherlands) concluded that there is a significant increases of competition over time in the mortgage market and the conduct of banks is growing being less collusive over time. Some authors associate the change in such bank conduct to the various deregulation and reform measures in the banking sector. For instance, Cerasi et al., (2001) argues that the increase in the degree of competition within the European retail banking sector associates with deregulation. Similarly, Bandt and Davis (2000) find that the Italian banking system, which is being

deregulated, is operating at an increased competition level. Nevertheless, some authors like Gual (1999) claim that market integration and enlargement appear one of the significant causes to witness a diminished concentration level in the European banking market.

As observed in the developed nations, the empirical evidences from the studies done in developing and emerging banking markets witnessed a mixed result regarding the structure-efficiency debate. For instance, a study of Claessens et al., (2001), which consists of 80 developing countries from 1988 to 1995, did not reject the collusion theory. The result shows foreign investment relates positively with profitability and high interest rates, whilst they have increased overhead costs contradicting the hypothesis that foreign bank profitability is driven by higher efficiency. Berstain and Fuentes' (2005) study on the link between banking concentration and price rigidity in Chile for the period of 1995 to 2002 finds that high concentration generates more rigidity in the deposit rates. Their findings are interpreted as being broadly aligned with the SCP theory. Unlike such findings, a cross country analysis on developing nations market by Gonzalez (2005) results in an outcome supporting efficiency hypothesis. A study in emerging market by Park and Weber (2006) from a sample of Korean banks evidenced that bank efficiency rather than collusion is a cause of improved bank in Korea. Samad (2008) tests the validity of these two hypotheses (SCP and ESH) for the Bangladesh banking industry by using pooled and annual data for the period 1999–2002; he finds support for ESH as an explanation for market performance in Bangladesh. The most recent studies on emerging banking markets that have found support for the efficient structure hypothesis are Seelanatha's (2010) on Sri Lanka and Chortareas' et al. (2011) on Latin America. Other studies in developing nations are also in line with some of the variants of the structure-efficiency hypothesis. For instance, Guerrero et al., (2005) study on the Mexican banking industry find evidence in support of the relative market power hypothesis.

In Africa, Fosu (2013) has concluded that despite record levels of new entry and foreign penetration, very high levels of concentration characterized African banking

sectors. The average Herfindahl-Hirschman Index (HHI) is as high as 2059, whilst the five-bank concentration ratio stands at 77.29% for the whole African region. On the positive side, concentration assumed a downward trend across all the sub regions over the past few years. The Herfindahl-Hirschman Index (HHI) shows dramatic and consistent downward trend in all sub regional banking sectors except West Africa, where the trend is moderate. The decline is associated with African governments' willingness to embark on financial sector restructuring involving deregulation and a relaxation of entry barriers to foreign investment (Beck and Cull, 2014). The financial sector reforms include: reducing credit controls and reserve requirements, removing interest rate controls, reducing entry barriers to foreign banks; state ownership, developing securities markets, strengthening prudential regulation and supervision. These developments appear to have improved the financial soundness of African banks (Amidu 2013). However, the high concentration level is a describing attribute of African banks. Fosu (2013) witnessed the aforesaid scenario using the five-bank concentration ratios. Therefore, consistent with other emerging economies, the study result suggested that African banks generally demonstrate monopolistic competitive behavior.

Country specific studies in Africa also witnessed the prevalence of a high level of banking market concentration. For instance, studies in the South African banking sector show that the banking industry exhibited a high concentration feature (Falkena et. al. , 2004 ;Okeahalam ,2001). Therefore, the African banking market still remains with a structural problem to ensure a competitive market as the high share of the banking market is still controlled by few large banks. Studies also show structural rigidities, evidenced by high interest rate spread, remain major impediment to achieving competitiveness in the banking sector in Africa (Beck and Fuchs, 2004). Sanya and Gaertner (2012), Mwega (2011) and Mugume (2010) in separate studies, empirically assess bank competition in four countries, Kenya, Uganda, Tanzania and Rwanda. Sanya and Gaertner (2012) studied the four countries jointly, whereas, Mwega (2011) and Mugume (2010) studied Kenya and Uganda, respectively. The study's results show that competition in the banking sector in the four countries is fairly low. The socio-economic and structural factors are given as being behind the lack of competition in the

four countries. Studies also suggested that market concentration is a major determinant of bank profitability in Africa (Nonye, 2012 for Nigeria, Nabieu, 2013 for Ghana).

In general, the international evidence on competition presented in Africa includes a small number of large African countries (Schaeck et al., 2009). Furthermore, studies do not account for the regulatory and institutional factors that are likely to shape competition in countries characterized by a variety of imperfections (caused by a lack of development, weak institutions, governance and barriers to entry) (Classesns and Laeven, 2004).

3.8. Studies Conducted in the Ethiopian Banking Sector

Muir (2012) referred Ethiopia's banking system as 'weird' and it's like a throwback to an earlier Africa, the Africa of the 1970s or 1980s. The reason cited by him was related to the high concentration and, hence, the structure of the sector. He stated that the banking system is dominated by two big state owned banks accounting more than 50% of all lending. Muir's argument also extends towards the ownership structure of Ethiopian banks. He cited that the dominant state ownership revealed in Ethiopia is 'weird' phenomenon as compared the scarce existence of banks all over Africa.

In the Ethiopian context, the high concentration aspect seems a more general truth than a research topic inviting further investigations. Bank and financial sector related studies usually cite the concentration of the Bank industry as the area deserves attention. However, very limited studies instituted to provide in-depth analysis on the extent of concentration and its impact on bank performances. A notable attempt in such regard is by Lelissa (2007) who has measured the banking concentration using HHI and k-bank (K1,2,). He has found that the Ethiopian banking system is highly concentrated and dominated by the state owned bank. However, the study lacks to test the impact of such result on the performance of banks.

On the other front, the empirical works in foreign countries reviewed above have supported either the SCP or Efficiency or both paradigms. However, there is lack of such studies in the context of Ethiopia. Bank related studies in Ethiopia can be classified into: performance assessment related, related to the financial liberalization and focused on efficiency analysis.

Performance related studies witnessed the positive trend in bank performance indicators. Study of such a kind includes (Jenber, 2001), who assessed developments in market share, balance sheet, capital adequacy and profitability using data for 1997/97-1999/00. The study pointed out that profitability of the banking industry in general was high in the study period and profitability of most private banks in particularly was encouraging. The other variant of study with regard performance is the attempt to segregate variables impacting bank performances. For instance, studies of Kapur (2009), Benti (2007), Abera (2011) and Nigussie (2012), examined either of the bank-specific, industry-specific, macro-economic or all of the three factors affecting bank profitability in Ethiopia. In terms of variable selection, the studies have used capital strength, bank size and gross domestic product, operational efficiency and asset quality. Some of the studies, however, are focused on private banks and the public banks, which constitute the high share of the industry, were not in the domain of the study. Methodologically, the studies have used multiple linear regression techniques to assess impact of selected variable on the profitability of banks. An exception in such regard is Benti (2007), who has used panel data GMM estimator, to assess the impact of the stated variables on private banks' profitability performance. Nonetheless, the analysis is done excluding the stated owned bank.

Bank reform related studies seem to have similar concerns with regard to the gradualism and incomprehensive liberalization measures of the 1990's. Therefore, most of them are intended to indicate for a great need for additional market oriented reforms to further enhance the sector's role. For instance, Geda (2006) assessed empirically the pre and post reform performance of the commercial banks in Ethiopia. He showed that the financial sector reform has brought lot of changes to the Ethiopian banking industry

and criticized the slower pace at which the reform is moving on. Bezabeh and Desta (2014) also suggested the additional policy initiatives to be undertaken by the government to activate the sector. These include: a) reversing the decision prohibiting foreign banks from investing in the country, b) fully privatizing the state-owned commercial banks, c) allowing market forces to determine interest rates and the exchange rate of the Ethiopian currency, Birr (ETB), and d) upgrading the regulatory and supervisory capacity of the National Bank of Ethiopia to facilitate efficiency in the banking market. However, methodologically, the studies are qualitative descriptions supported by trend or point in time data on selected indicators like deposit, loans etc.

On the efficiency front, studies are focused on commonly used efficiency measures like expense management or overhead control etc. ADB (2011) report shows that the traditional method of approaching the efficiency measurement issue of financial firms such as banks is the financial ratio analysis which has some major drawbacks. For instance, Berger (2009) mentioned that ratio analyses do not control for individual bank outputs, input prices, or other exogenous factors facing banks in the way that studies using modern efficiency methodology do, may give misleading results. Therefore, the report recommends for managers of banks and policy maker to search alternative tools (such as DEA) that compensate for the drawbacks in financial ratio analysis (ADB, 2011). A breakthrough in such front was the study of Rao and Lakew (2012) who examined the cost efficiency and ownership structure of commercial banks in Ethiopia using data envelopment analysis (DEA) and Tobit models. The study found that the average cost efficiency of state-owned commercial banks over the period 2000-2009 is 0.69 while that of the private commercial banks is 0.74. The aggregate cost efficiency of Ethiopian commercial banks is found to be 0.73. In addition, the study found little statistical evidence to conclude that the state-owned commercial banks are less cost efficient than the private commercial banks. Thus, ownership structure has no significant influence on the cost efficiency of commercial banks in Ethiopia. Similarly, Lelissa (2014) explored the efficiency level of Ethiopian Banks for the period 2008-2012 using the DEA model and finds a notable variation among banks in terms of level of efficiency.

3.9. Snapshot on the Recent Trends of the Empirical Studies

Empirical investigation of the SCP follows a similar methodological framework across the various studies in different countries. Recent publications around the globe following similar methodological approach as in this research continue to result in mixed outcomes. For instance, Pawłowska (2016) find no evidence of the SCP hypothesis in the Polish Banking system while Çelik and Kaplan (2016) find a result supporting the modified efficient structure hypothesis in the Turkish banking sector. In Africa, a study by Ebenezer and Oladipo(2016) for the Nigerian Banking sector estimated a positive relationship between the bank performance (profitability) and market concentration supporting SCP. A similar study in Malaysia by Ab-Rahim and Chiang (2016) offers support to the efficient hypothesis. There was also attempt to test the competition in the banking sector applying the Panzar-Rosse approach. Simatele (2015) using bank level data for the period 1997 to 2014 explored the competitive environment in the South African banking industry and finds that South African banks operate in a monopolistically competitive market structure. Other studies also attempted to link market structure with industry growth. A study in such path includes Khan.H. et.al., (2016) whose results indicate that higher bank concentration may slow down the growth of financially dependent industries and recommends for regulatory cautions while pursuing a consolidation policy for the banking sector in emerging Asian economies. Likewise, some of the studies in developed countries like US investigated the impact of competition on cost and technical efficiency. The study by Bayeh et.el., (2016) finds that market power, as measured by the Lerner index, increases U.S. banks overall cost and technical efficiency. A contrasting study by Chen et.el., (2016) evidenced that an increase in the degree of bank competition leads to weaken the industry performance, especially. during non-crisis period in the Tiwan banking sector. Integrating competition /market structure with efficiency, Alhasen and Asare (2016), estimated the technical and cost-efficiency scores of the Gahanian banks and find that competition exerts a positive influence on cost efficiency. A recent attempt, while this study is on progress, in the Ethiopian banking sector is done by Lera and Rao (2016) that explored the effect of concentration on the performances. Their study has focused on testing the four

structural theories that results in support of the managerial efficiency version. Nevertheless, they still have used the quantitative approach and assumed that conduct of banks is a derivative of the industry structure. In addition, they have used limited control variables and most importantly ignored the regulatory factors in their models.

In sum, in spite of the level of economic development, studies in industry concentration are being widely conducted across the world. Studies methodologically follow the original SCP as well as alternative industry competitiveness assessment models. Nevertheless, the objectives in the studies remain closer.

3.10. Summary

The overall results of studies related to concentration-profitability relationship have been far from being indisputably conclusive. In other words, no unique conclusion can be drawn from the results of the existing studies since favorable empirical evidence produced by some studies has strongly been challenged by the opposite type of evidence of others. However, the discipline has enriched from the opposite or supplementary ideas coming from various scholars. The originators of the SCP hypothesis argue that better performance by large firms in an industry is a result of market concentration. This hypothesis faced a strong attack from those trusting efficiency as a source of better performance. Followers of the efficient structure hypothesis claim that market concentration is not accidental event but is the result of superior efficiency of firms. Therefore, efficient firms managed to obtain a large market share. Hence, the positive and significant relationship between concentration and bank profitability should be considered from the efficiency point of view. This is due to the fact that there no relationship between concentration and performance, but rather between market share and bank profitability.

On the other hand, the quiet life hypothesis has brought a new dimension via taking in to consideration the impact of market structure upon bank management's risk-return preferences. According to this explanation bank management in concentrated market is

highly sensitive about showing high profits and, therefore, has high tendency for a quite life, the failure of explicit recognition of such behavior may produce weak or statistically insignificant relationship between the concentration and bank profitability evidences. Still, others like contestable market theory claims that barriers to market entry and exit are not prelude (if market is contestable), then, there is no basis for assessing a significant value to the market concentration variable in determining bank profitability. According to them, it is quite possible to have outcomes approximating those of perfect competition even though the number of actual competitors is quite small or concentration is quite high provided that the market is contestable.

With an attempt to change the direction of focus of the profit-concentration relationship, the NEIO's claim that individual industries offers the best opportunity to understand the competitive mechanisms at work. Unlike the empirical literature on SCP, which was primarily based on cross-section studies, the NEIO focuses on econometric testing of particular aspects of conduct in single industries with the objective of detecting market power or changes in the collusive-competition behavior of firms.

However, a detailed review of existing literature on the SCP relationship indicates that:

- the majority of studies employ a multiple linear regression model where a measure of bank performance (mostly profit) is regressed on market concentration variables (such as k-firm, HHI etc) along with some control variables
- the empirical divergence between SCP and competing hypothesis is still not conclusive which is attracting a lot of research works across the world and recently in Africa.
- studies on SCP by large are dominated by quantitative analysis with exclusion of non-quantifiable variables such as related to conduct and/or those lack data (regulation).
- few studies have explicitly considered Ethiopia's banking performance using the structural approach (SCP or ESH). Nevertheless, the existing bank performance studies were not analyzed incorporating big banks in the industry with long period observation of banks using parametric and non-parametric methods which are scarce in the Ethiopian context. Studies that used the structure model have also

limited focus on other key variables like regulation, macroeconomic and industry factors. They have also applied a quantitative approach and assumed conduct as being a derivative of the market structure. Hence, there was no attempt to explore the behavior of banks within the given structure, banking and microenvironment.

Therefore, the study extends the current research of Ethiopian banks structure in several ways:

- The study tries to show using the structural models how the profitability measure is affected by market concentration (SCP) or market share (ESH).
- The study applies a direct measure of efficiency and conduct assessment on the variation on efficiency among banks owned by different entities. Moreover, it applies an extensive panel data set to examine the Ethiopian banking system
- The study with its modified SCP framework employs variables that reflect the feature of the Ethiopian banking system (e.g. income composition, sources and measures of liquidity etc). Therefore, it provides new evidence from Ethiopian banking industry which structurally can be cited as a unique banking system.
- The study also has considerations for specific variables which are spotted by other scholars to be missing from the analysis of concentration/efficiency-profitability relationship. This includes variables like regulation, risk etc. which basically have a stake in the performance of the banking sector.
- The study explores other neglected topics in the SCP framework such as the conduct/strategy of banks with suitable methodology for the purpose. In such regard a quantitative approach on the qualitative factors reflecting the conduct of banks is instituted.

The cited points above as a whole become a further contribution of the present study to SCP hypothesis test within the context of the Ethiopian commercial banks function. Moreover, specifically, the empirical study done by formulating a bank performance model and testing with data generated by the Ethiopian commercial banks provide new evidence on market concentration–profitability front. The modified conceptual framework developed in the study contributes to scholars who would like to further investigate the impact of industry structure and efficiency on bank performance.

CHAPTER FOUR

CONCEPTUAL FRAMEWORK AND VARIABLE CHOICES

4.1. Introduction

The review on previous studies shows that there is a noted gap in bank performance studies with regard to comprehensiveness of the variables used and the methodological framework. Therefore, based on strands of literature from the SCP framework, determinants of bank performance, the efficiency theory, bank regulation and activities of Ethiopian banks, the conceptual framework stated below has been developed for this study.

The contribution of the aforesaid review to the model includes the following:

- The SCP model provides an overall outline for a conceptual framework to study the impact of market concentration on performance,
- The transaction flow inferred from the financial records of banks enables to make sense of the real-life market situation in the Ethiopian banking system. In addition, it serves as a platform to easily identify variables that have significant influence on the profitability performance of banks,
- Literature input on the determinants of bank performance is also used to identify the control variables to be integrated in the framework. Following the literature work, the elements in the framework are segregated in to three parts: the internal, industry and macroeconomic as well as regulatory factors. A regulatory tool (which is used by the NBE) to rate banks, the CAMEL (Capital Adequacy, Asset Quality, Management, Earning and Liquidity) framework is used to set internal factors affecting the performance of banks. The industry and macroeconomic factors following the review of literature with priority focus on factors are believed to have influence on a unique banking system like Ethiopia. The efficiency concept is intended to incorporate a direct measure of efficiency in the test of the concentration-performance relationship (as done in the Berger and Hannan model, 1998).

- The model also incorporates variables identified from previous literature and commented to be missed from the analysis of price-concentration relationship. This includes variables related to regulations (as separate control variable) and bank risk (embedded in the CAMEL framework), conduct (testing the 'quiet life' hypothesis and selecting pertinent determinant from Neuberger (1997) SCP framework) to be explored qualitatively.

4.1.1. Banking Activities/Operations

The Money and banking Proclamation No. 83/1994 identifies banking business as:

...an operation that involves such activities like receiving funds, discounting and negotiating of promissory notes, drafts, bills of exchange and other evidence of debt; receiving deposits of money and commercial paper, lending money, and buying and selling of gold and silver bullion and foreign exchange.

Even if the list in the proclamation is exhaustive, from the balance sheet and income statements of banks it can be inferred that the main stay of banks largely relied on the intermediation activities (NBE report, 2015/16). A bank is usually defined as an institution whose current operations consist in granting loans and receiving deposits from the public (Mishkin, 2001). Therefore, as core to their functions, banks need to mobilize deposits (in local and foreign currency) from the public so that they can lend the deposit to borrowers and foreign currency users and earn income in the process. The need for more liquidity is associated with the high leverage position following the very limited capital base of banks as compared to their asset holdings. For instance, the capital to asset ratio for banks in Ethiopia in year 2015 is 17% reflecting that a great part of banks' activity is financed through deposit collection (NBE, 2015/6).

From the income structure of banks, it appears that the current trend in banking activities seem altered towards pursuing a mix of fee-generating activities along with the intermediation business. That is, Instead of just accepting deposits and making loans;

they receive good sum of earning from fee-based activities like foreign operations and off balance sheet activities. Literature also supports that non-interest income is among the most rapidly growing sources of revenue for deposit accepting institutions (Rose and Hudgins, 2008). A similar trend has been noted in the Ethiopian banking situation where income from non-interest sources is revealing growing trend overtime. For instance, the share of fee income from international banking activities in some banks exceeds the income from interest sources. Industry wide scenario also reflects fee income has constituted almost half of the total earning of Ethiopian banks (NBE report, 2015/16). Nachane and Ghosh (2007) remarked that the dynamism in the banking sector has urged banks to be innovative in their operations. This innovation process has contributed for wider expansion in the off-balance sheet activities which are contributing for the expansion in fee income. This may, however, have effect on increasing overall risk of banks by exposing them to high income volatility. In addition, literature suggested that banks with relatively high non-interest earning assets are less profitable (Demirgiic-Kunt and Huizinga, 1999). Despite such argument on the risk associated with holding high share of non-interest income, the significant share of fee income justifies the need to incorporate them in the analysis of bank performance. More specifically, if performance is rated based on profitability measure, excluding fee-based variables will lead to bias. For instance, Rogers (1998) explained that the exclusion of nontraditional activities in the estimation of bank performance and efficiency actually understates it.

The other scenario which differentiates banks from other businesses is that of the existence of risk factors. This is because the capital base of a bank is smaller relative to the asset base and liability it holds. In terms of the risk types, Allen and Cartelli (2008) identified two major risk types which are associated with the core activities of banks: default and liquidity risks. Thus, existence of both liquidity and default risk for a bank differentiates it from an ordinary firm and the impact of such risk factors on performance should deserve consideration.

In this study consideration for both intermediation and key fee generating activities (like foreign banking operation) is considered in an attempt to test the impact of bank specific

variables on performance. In addition, the framework incorporates major risk components (like liquidity and default risk) as outlined in the literature in order to test their effect on bank performance.

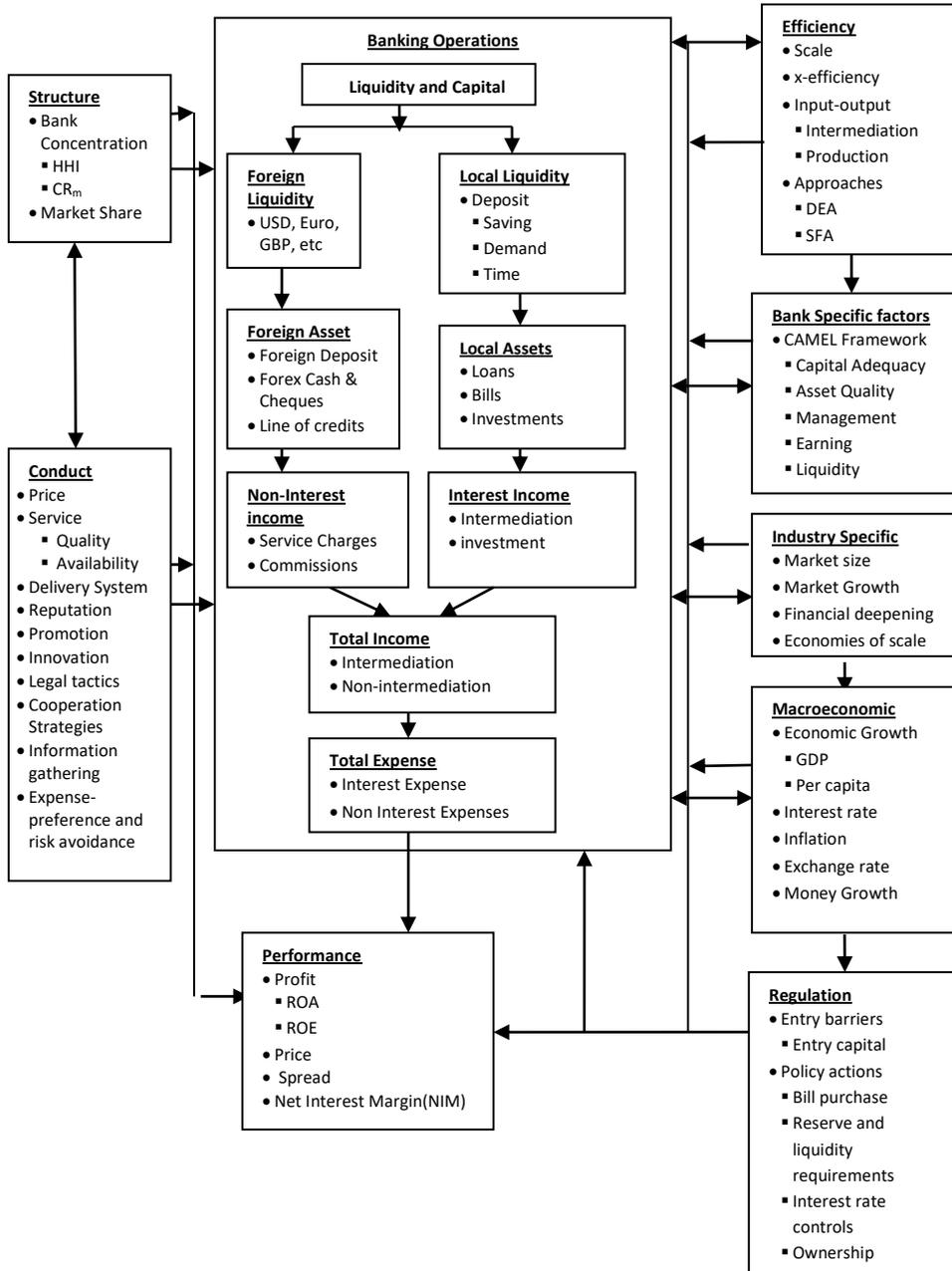
4.1.2. Industry Structure

The SCP paradigm is based on the premise that in the concentrated markets, a bank can impose higher interest spreads by setting higher lending rates and lower deposit rates. Therefore, measuring the level of concentration is important to know the type of market structure and the existence of collusive activities in the banking system.

4.1.3. Measures of Bank Concentration

Concentration refers to the degree of control of economic activity by large firms (Sathye 2002). The definition is much concerned about the market share of large firms in the industry. That seems the reason for empirical works focus on the number of firms and their relative size in order to gauge market concentration. As shown in empirical evidences, the most common type of concentration measures in bank are the k-bank concentration measure and the HHI (Repkova and Stavarek, 2014). Following the literature strand and interview findings, the study makes use of both the K-bank concentration and HHI index so as to explore the central research question: testing the concentration-performance relationship in Ethiopian banks. The number of banks to be taken in the k-bank model might not be a problem in highly concentrated banks like Ethiopia as even taking one big size bank (with market share exceeding 50%) can reveal the concentration level in the industry. Therefore, based on the interview suggestions, it has used a one bank concentration index to measure the industry structure. In addition, the framework considers the concentration level in both deposit and loan market in order to provide comprehensive assessment on core activities of banks.

Figure 4.1: Conceptual Framework of the SCP for Ethiopian Banks



Author's Framework (modified from the Structure-Conduct-Performance Model of Neuberger, 1997))

4.1.4. Bank Conduct

One of the shortcomings of the empirical studies employing the SCP model is that they fail to allow for banks' market conduct explicitly (Bikker and Haaf, (2002a)). Instead, they consider it as being determined by structure. This is with the assumption that the behavior of firms in the market is determined by the structural characteristics of the industry (Mohamed et. al., 2013). Scherer and Ross (1990) suggest that conduct in the SCP-paradigm is related with the firms' product strategies, innovation and advertising. It focuses on how firms set prices, whether independently or in collusion with other firms in the market and on how firms decide on their advertising and research budgets, and how much expenditure is devoted to these activities. Conduct also takes into consideration research and development, mergers, legal strategies, etc. and a product strategy where each firm is constantly attempting to develop new brands (Grigorova et al., 2008). A more comprehensive framework for assessing bank conduct is provided by (Neuberger, 1997). In addition to above stated factors, he has included the following factors to reflect bank conduct: branch network and quality competition, advertising, collusion, mergers, etc (Neuberger, 1997). There is also an attempt to look at the conduct of banks through indirect assessment on how customers perceive banks. However, the variables are similar with the aforesaid identified conduct factors. For instance, Zineldin (2011) has used service quality, credit availability and price competition, delivery system, promotion, etc as parameters to determine bank selection. On similar study, Sleh (2013) has used reliability, convenience, accessibility etc as a surrogate measure of bank conduct from the point view of the customer.

In terms of quantitative data representation in the SCP model, literature has used a single proxy measure of conduct i.e. the advertising expense. That means, the strategic behavior of banks is examined in terms of their selling efforts (Sahoo, 2012). The selling efforts refer to expenses by the bank towards advertising, promotion of services, and developing service networks. This is with the presumption that advertising battles may well expand or enhance the level of product differentiation in the industry and acts as entry barriers creating market concentration. Even a consensus on such interpretation is

not reflected as advertising can also facilitate entry of new banks by helping them in making their product/services known to the consumers quickly so that the concentration increasing effect can be dissipated or even reversed. In addition, advertising expense disregards non-quantifiable parameters representing banking conduct like price discrimination, collusion, mergers, information gathering, innovations, etc.

Due to the above factors, the researcher argues that the attempt to assess conduct through surrogate measures like advertising expense will not reflect the situation in Ethiopian Banks. In addition, banks usually do not publicize the expense for promotion and advertising expense constitutes a very negligible part of banks' expense. For instance, the interest expense and general as well as administrative of banks constitute more than 80% of the total expense in Ethiopia (NBE report, 2015/16). Hence, as outlined in the framework, in-depth assessment on bank conduct might not be straightforward as testing the concentration-performance relationship. Therefore, this framework has set:

- to test the observed managerial behavior in highly concentrated market like Ethiopia by use of the quiet-life hypothesis. In such regard the hypothesis on the existence of a quiet life scenario is tested via relating concentration with efficiency measures.
- in addition to applying identified variables in the literature (like price competition, branch network, competition, promotion, innovation, expense preference and risk mergers etc.), to qualitatively assess their further enhancement or decline resulting from the test of the SCP and quiet life hypothesis.

By doing so, the framework provides a fertile ground to test the research sub-questions related to investigating the conduct of Ethiopian banks with the given structure and performance determinant factors.

4.1.5. Efficiency

Berger (1995) has used two efficient-structure hypotheses in explaining why market power can lead to higher profits. The x-efficiency asserts that firms with superior

management of production and technologies have lower costs and therefore higher profits. The scale-efficiency hypothesis claims that firms tend to have equally good management and technology, but some simply produce at more efficient scales than others, and as a result, have lower unit costs and higher unit profits. Therefore, the technical capacity of firms than their managerial capacity explains the variation in the scale efficiency.

a. Efficiency Measures/Approaches

The different methodologies for measuring efficiency can be divided into parametric and non-parametric (Leon, 2014). Data Envelopment Analysis (DEA) is the most common and widely used non-parametric method. DEA differs from a simple efficiency ratio in that it accommodates multiple inputs and outputs and provides significant additional information about where efficiency improvements can be achieved and the magnitude of these potential improvements. Moreover, it accomplishes this without the need to know the relative value of the outputs and inputs that were needed for ratio analysis (Cooper, Seiford and Tone, 2000). Some of the most important advantages of the DEA methodology include the lack of restrictions on the functional form, the different variables and values (e.g., ratios) which may be used. There is possibility of measuring those variables in different units, and the fact that any deviations from the efficiency frontier are noticeable (Thanassoulis 2001). The stochastic frontier model is another variant used to address some of the stated weaknesses of DEA. However, the disagreement on frontier model among researchers at present comes to one focus by preferring the lesser of the evils. The non-parametric studies impose less structure on the frontier but commit the sin of not allowing for random error owing to luck, data problems or other measurement errors. If random error exists, measured efficiency may be confounded with these random deviations from the true efficiency frontier. Therefore, a consensus on which efficiency-measuring frontier is preferable has not yet been achieved (Berger and Humphrey, 1997; Goddard et al. 2001). Therefore, the study's conceptual framework is based on the DEA approach which is justifiable from the most important advantages of the DEA methodology. For instance, it includes the lack of

restrictions on the functional form, the flexibility of measuring variables in different units, and the fact that any deviations from the efficiency frontier are noticeable (Thanassoulis, 2001). The stated advantages will provide flexibility to the study to use various inputs which are measured in different units (for instance, those measures in number like branch size, staff etc. and others measured in monetary terms like loans , deposits etc).

b. Input-Output specifications

DEA models can be either input- or output- oriented according to whether the focus is on input minimization while keeping a given output level or output maximization given levels of the inputs. The theoretical literature is inconclusive as to the best choice among the alternative orientations of measurement (Goddard et al. 2001). However, it is important to note that output- and input- oriented models will assume exactly the same frontier, thus, identifying the same set of efficient banks. The non-tangible nature of bank output and theoretical gap in the banking literature on multi-input-multi-output structure causes confusion in the definition of output measurement. There are two different methods of tackling this problem, i.e. production approach and asset /intermediation approach.

c. Production Approach

Banks are thought as primarily producing services for account holders. They are considered as firms which employ capital and labor to produce different types of deposit and loan accounts. They perform transactions and process documents for customers, such as loan application, credit reports and payment instruments. Under this approach, outputs are measured by the number of deposit and loan accounts or number of transactions performed on each type of product, while total costs are the operating costs used to produce these products. Banks are viewed as producers of two types of services: deposits of funds and users of funds.

d. Intermediation approach

Banks are considered as primarily intermediating funds between savers and investors; they are intermediates of financial services rather than producing loan and deposits account services. Since service flow are not usually available, the flows are typically assumed to be proportional to the stock of financial value in the accounts such as the number of dollars of loans, deposits (Berger and Humphery, 1991). Here, input of funds and their interest cost should be included in the analysis since funds are the main 'raw material' which is transformed in the financial intermediation process. This means, banks give intermediation services through the collection of deposits and other liabilities and the transfer of these funds to interest earning assets (Sealey and Hendly, 1997 cited in Isik and Hassen, 2002). Deposits are included as third input along with capital and labor. As a result, Operating costs, as well as interest costs, are taken into account in the production process.

Both approaches do not capture the dual roles of banks as:

- a) providing transaction (document processing services) and
- b) being as financial intermediaries that transfer funds from savers to investors.

But each of the approaches has some advantages. The production approach may be somewhat better for evaluating the efficiencies of branches of banks because branches primarily process customer documents for the institution as a whole and branch managers typically have little influence over bank funding and investment decisions. The intermediation approach may be more appropriate for evaluating entire banks because this approach is inclusive of interest expenses, which often accounts for one half to two third of total cost.

Furthermore, the intermediation approach may be superior for evaluating the importance of frontier efficiency to the profitability of the bank since minimization of total costs, not just production costs, is needed to maximize profits.

The study applies the intermediation approach which is appropriate for evaluating the entire banks through incorporating inputs from core operation of banks. In addition, its

suitability for evaluating the importance of frontier efficiency to the profitability of the bank is believed to provide added value during the test of the efficiency-performance relationship in Ethiopian banking industry. The intermediation approach is also more appropriate for evaluating entire banks because this approach is inclusive of interest expenses which often accounts for one half to two third of total cost. Besides, the intermediation approach is superior for evaluating the importance of frontier efficiency to the profitability of the bank since minimization of total costs, not just production costs, is needed to maximize profits. Therefore, the DEA intermediation approach is used:

- to test the impact of efficiency on bank performance in the Ethiopian banking context. In such attempt both x-efficiency and scale efficiency of Ethiopian banks are computed and incorporated in the linear regression model that tests the concentration-performance relationship.
- as a separate examination based on the DEA score to test if there is any variation in efficiency among Ethiopian banks.

Therefore, the framework has laid down to test the research questions related to the existence of efficiency variation among Ethiopian banks and framed a ground to test the efficiency- performance relationship as set in the hypothesis.

4.1.6. Regulations

Bank regulation typically refers to the rules that govern the behavior of banks, whereas, supervision is the oversight that takes place to ensure that banks comply with those rules(Casu et al.,2006). More specifically, bank regulations exist for safeguarding the industry against systemic risk, protecting consumers and to achieve stability (Llewellyn, 1999). Regulation is also important for the efficiency of the banking industry (Jalilian, 2007).Therefore, the assessment of some of regulatory variables appears important. As argued by Gilbert (1984)], a criticism of the methodology of earlier market structure studies is that the role of bank regulation was always neglected. There may be strong interactive effects between regulation and other variables which could have a significant impact on market concentration and firm performance. For example, interest rate

controls and a high degree of entry barriers facilitate market collusion with the result that even markets with low concentration may exhibit collusive behavior. In contrast, it may be argued that the protection which regulation affords may motivate banks to seek risk reduction by choosing safer operating strategies, resulting in a quiet-life type of market structure (Hicks 1935). Therefore, it is useful to mention that there exists two imperative types of bank regulations that have significant influence on the performance of banks (Molyneux and Thornton, 1992). This incorporates the structural regulation (concerned with banking market and performance) and prudential such as reserve ratios, capital requirement issues in banks. Therefore, in terms of measures, where there are high profits and collusive behavior in banking market, the regulatory authorities enhance banking competition using the structural regulation. The prudential regulations are required to enhance bank safety and wider economy as a whole

Unlike other studies, the conceptual framework is set in way to have considerations for regulatory factors which are expected to play an important role in the current market structure, conduct and performance of the Ethiopian banking system. The researcher considers the addition of the variable is important in Ethiopian context due to the high regulatory involvement in the banking system. This is also an important contribution of this study in which previous studies on similar topic were not able to provide coverage on. For instance, Claessens and Laeven (2004) commented that studies in Africa do not account for the regulatory and institutional factors.

The framework has set both structural (such as entry barriers like high entry capital etc.) and prudential (such as reserve requirement, exchange rate, interest rate controls). In addition, it has consideration for policy involvements that can affect bank performance (like requirement to purchase government bills, loan and deposit growth, branch expansion rate, asset quality target, etc.). Therefore, the framework provides important variables from regulation that can have impact on performance of banks. Such variables are used to empirically test the research hypothesis related to the impact of regulation on performance of banks and also suggest investigations on areas demanding regulatory involvement in the future.

4.1.7. Bank Performance

SCP studies of banking can generally be divided into two groups according to the measure of performance used. The first group uses some measure of the price of particular banking products and services in order to capture the performance of the firm, while the second uses a profitability measure such as return on assets or return on equity. However, using the price of a single banking product as a measure of performance may be misleading because of the multi-product nature of a bank's output.

Profit measures may be more informative, but may also be more difficult to interpret because of the complexity of the accounting procedures involved. Molyneux and Forbes (1995) emphasize that profitability measures, in which all product profits and losses are consolidated into one figure, are generally viewed as more suitable because they bypass the problem of cross subsidization.

Evanoff and Fortier (1988) suggest a number of reasons why profit measures is preferable. Firstly, although some studies have used bank product prices as the dependent variable, banking is a multi-product business and individual prices may be misleading. Prices can only be used if costs directly associated with these prices are explicitly accounted for as explanatory variables. Secondly, the potential for significant cross subsidization between products obviously exists and pricing strategy will differ across markets. The use of a profit measures eliminates many of these problems

This being the scenario used in most literatures in measuring performance of the banking system, the whole idea of measuring bank performance is to separate banks that are performing well from those which are doing poorly (Berger and Humphrey, 1997). Bank regulators screen banks by evaluating banks' liquidity, solvency and overall performance to enable them to intervene when there is need and to gauge the potential for problems (Casu and Molyneux, 2003). On a micro-level, bank performance measurement can also help improve managerial performance by identifying best and worst practices associated with high and low measured efficiency.

Therefore, the framework has set both profit and price related measures of bank performance. The test of concentration and other identified variables is done applying both measures of performances. This enables the study to contribute on providing evidence to regulators on the proper measure of performance in the Ethiopian banking industry.

4.1.8. Control Factors

Most of industry concentration studies use control variables from both bank specific and external environment. Usually the studies employ few control variables related to risk, ownership and others to control the structure-efficiency variables. Nevertheless, a more exhaustive list of control variables affecting performance is employed in specific studies related to determinants of bank performance. In such studies, the control variables are mostly classified in to two parts: internal and external. For instance, Al-Tamimi (2010), Aburime (2005), have classified the determinant factors as internal and macroeconomic variables. The internal factors are defined as the characteristics exhibited by individual banks and which fall under the management's control. On the other front, the external factors include sector or country wide factors and appear outside the control of the management but have a bearing on performances. There are also studies which attempted to separate the external factors into sector and macroeconomic variable (Ongore ,2011). The former considers industry related factors that commonly affects the individual banks while the later takes into account the general economy wide variables. Some authors, for instance, Chantapong (2005); Olweny and Shipho (2011) provide a focus on the sector variables only as they are commonly shared by banks.

The approach that is most commonly used by bank regulators to monitor performance is the CAMEL approach. This is a composite of various bank performance components that management is expected to act upon so as to improve performances. The CAMELS approach evaluates financial institutions like banks on the basis of SIX critical dimensions which are: Capital adequacy, Asset quality, Management, Earnings Liquidity, and Sensitivity to Market risk. Nevertheless, the sensitivity to market risk

which requires a well developed financial market is not commonly used in the developing countries studies. Each of the components and the variables to be used in this study is explained below:

i. Capital Adequacy

The Capital Adequacy ratio is the ratio of banks primary capital to risk weighted assets (Directive No. SBB/9/95). Regulators like the NBE issue directives on the manner of computation of the capital adequacy ratio which is a specification on the risk conversion rates for on and off balance sheet assets as well as classification of different components of capital. The directive demands banks to strictly maintain a capital level exceeding or equivalent to 8% of the risk weighted assets. This is with the intent that holding a reasonable level of capital is expected to serve as cushion in times of crisis (Dang, 2011). Nevertheless, such view is also supported by others as adequate capital level being a source of liquidity enhances performance via reducing the banks' financing costs (Diamond, 2000). Holding a high capital level is also challenged by the counter view in that it reduces the return on equity. This is because excessive capital encourages a low risk taking attitude that potentially impacts the earning potential. Furthermore, a higher capital reduces the debt position of firms resulting in lower earnings from the tax exemption from debt leverage Bourke (1989) and Berger (1995). Therefore, the impact of the capital adequacy ratio has uncertain a priori as it could potentially reduce or improve performance depending on its utilization and level of exposures. The study uses the capital to asset ratio which is not risk adjusted to proxy the actual capital adequacy ratio as the data is not publicly available.

ii. Asset Quality

As discussed above, one of the critical success factors for better bank performance is its ability to manage the risk emanating from defaults. A bank balance sheet is mostly a composite of various asset elements such as cash, foreign deposits, reserves at the NBE, loans, investments, fixed assets etc. However, the loan portfolio remains to have the dominant share of the asset especially for banks that highly rely on the intermediation business for their earnings. Therefore, keeping the quality of such asset

is witnessed in many studies to affect performances. For instance, Dang (2011) claims that delinquent loans are the highest risk components whose poor handling can lead to substantial losses. Similarly, Liu and Wilson (2010) finds that problem in credit quality reduces the profitability measures, the ROA and ROE. Correspondingly, the impact on the price measure Net Interest Margin (NIM) appears positive as banks look for an increase in their margins to reimburse their default risk as well as monitoring credits. Usually, the share of nonperforming loan in the total loan portfolio is employed to measure the asset quality of banks. Even regulators sometime set a threshold for banks to monitor their asset quality level. For instance, in Ethiopia, the NBE has set banks to maintain their nonperforming loan ratio to a maximum of 5% of their credit exposure in terms of loans and advances. Nevertheless, banks usually keep their record on delinquent loans confidential, hence, studies are obliged to use another proxy measure, the provision to total loan ratio as a measure of the asset quality (Kumbirai and Webb, 2010). This study also uses the provision to total loan ratio as a measure of the risk arising from credit defaults. As pointed in the start of this section, banks ability to diversify income through integrating both interest and non interest income sources as another variable revealing quality of assets. Therefore, the study also similarly follows the same trend as noninterest income appears a growing business in the Ethiopian banking industry.

iii. Management

Banks as financial firms managing large resources, their management quality obviously affects their performances. Nevertheless, empirical studies usually confirm the difficulty in measuring management performances with financial ratios (Ongore, 2013). The regulator like NBE also apply various quantifiable and non-quantifiable factors to rate the management performances. Empirically, however, there is an attempt to apply proxy financial measures to measure management and mostly from the efficiency side. The ratios applied to measure management include: operating profit to income ratio (Rahman et al., 2009) and costs to total assets (Nassreddine, 2013) , cost to income ratio Altunbaset.el (2001)). In terms of relationship with performances, the applied

management quality measures are found to relate positively with performances. For instance, Altunbas et. al., (2001) investigated the relationship between management efficiency and profitability and finds a positive results. This study also employs the cost to income ratio as well as the efficiency measures that directly relates to management performance, the x-efficiency. This is derived from the efficiency score of the DEA.

iv. Liquidity

The liquidity status of a bank indicates the bank's position to meet its obligations in a timely and effective manner. Even its considered as one of the factors determine a bank to stand as a financial institution (Samad, 2004). The measurement used, nevertheless, has wide variations among the various empirical studies. Some authors like Ilhomovich (2009) used cash to deposit ratio to measure the liquidity level of banks in Malaysia. Others use the loan to deposit ratio, liquid asset to asset etc. Regulators in most countries, however, set the minimum required level of liquidity holding of banks. A similar trend is witness in Ethiopia where the NBE set the liquid asset to deposit ratio which is expected not to fall below 15% of the Bank's net current liability of which around 5% is expected to be held in the form of primary reserve assets, cash and assets easily convertible to cash (see directive no SBB 55/2013).

Studies reveal a mixed outcome with regard to the relationship between bank liquidity position and performance. Studies witnessing a negative relationship between liquidity and performance claim that the liquidity reserves mainly of those that are compulsory remain a burden for banks (Berger and Bouwman ,2009). Others find a positive relationship state that a reliable liquidity position improves performance (Dang ,2011; Bourke ,1989). There are also other studies that are done in China and Malaysia that explored absence of a significant relationship between liquidity and performances of banks (Said and Tumin, 2011). This study, therefore, employees the liquid asset to deposit ratio, which is a measure used by the NBE to evaluate its link with performances.

a. External Factors

As stated above, the external factors affecting bank performances are separated into two parts: sector specific and macroeconomic factors. One of the sector related factors pointed in the literature is Bank size. This is measured considering the level of the industry market in terms of total deposits (Civelic & Al-Alami ,1991) or assets (Smirlock,1985). The variable is considered in the studies as to examine whether large banks are likely to be benefited from high level of product and credit diversification. Nevertheless, its relationship with performance has uncertain a prior. This is because on the one hand, an increased diversification level provides an indication on reduced attitude towards risk taking resulting in a lower level of return. On the other edge, bank size awards the benefit of economies of scale for large firms that allow them to bargain more effectively, oversee prices and in the end realize higher prices for their product (Agu, 1992).

Market size and market growth rate are also part of the variables from the banking sector that are theoretically and practically deemed to have a bearing on performances. The market sizes which is mostly represented by the aggregate market deposit of the industry explains the prospect that the entry is much easier in larger than in smaller markets. The relationship with performance therefore is expected to be negative in shallow markets. Nonetheless, there is an evidence on the positive relationship between market size and profitability as banks in large markets take on riskier investments resulting in higher returns (Rhoades & Rutz ,1982). The market growth rate which is usually computed as the percentage growth in market deposits is another variable used in empirical research to represent industry situation. The measure positively relates with profitability as a rapid market growth offers an opportunity for banks to enlarge profit opportunities (Chirwa, 2001).

The other variable indicative of the industry scenario is the capacity of banks to mobilize cost saving deposits from the market. It is obvious that demand deposit, which is attached with close to zero interest rate, is a cheaper source of fund in the banking system. Studies employing the share of demand deposits from total deposits find that the higher the share of demand deposits in the banks' resource stock, the more

profitability is going to be achieved (Smirlock, 1985). Overall, the study considers many of the aforementioned sector specific variables to establish a relationship with performance measures.

With regard to macroeconomic factors, studies consider a well functioning or growing economy as measure by the Gross Domestic Product (GDP) positively impacts Bank performance. This is because the trend in GDP has a strong relationship with the demand for banks assets. For instance, in times of slow economic growth, as the demand for credit in the market falls, that potentially disrupts the intermediary role of banks. In contrast, an economy witnessing a boom or positive growth trajectory, pushes the demand for high credit and creates opportunities for banks. This shows that during boom, the demand for credit is high compared to recession (Athanasoglou et. al., 2005). Likewise, Bourke (1989) presents evidence that economic growth associated with entry barriers to the banking market potentially boost banks' profits.

The other macroeconomic stability indicator, the inflation, is one of the most regularly tested variables as to its relationship with bank performances. Nevertheless, studies are far from conclusive with regard to the link between inflation and performances. Some authors explicating such fact claim that the effect of inflation on banking performance depends on whether inflation is anticipated or unanticipated (Perry, 1992). There are also others that support a positive relationship as a high inflation rate is associated with high loan interest rates resulting in high income. Nevertheless, studies seem to witness that the relationship between inflation level and banks profitability remained to be debatable (Athanasoglou et. al., 2005), or the direction of the relationship is not clear (Vong and Chan, 2009). The other factor which characterizes the Ethiopian economy and hence determines the trade facilitation role of banks is the trade Balance. The Ethiopian economy stayed in a long time trade deficit with a periodically widening level. Theoretically, literature shows that positive economic growth coupled with a strong export performance positively affects the performance of key economy sectors (Borio et al., 2001). More specifically, banks are beneficiary of a growing export as they can easily acquire forex resources to comfortably serve the needy customers. In the process, they can earn a notable size of income by charging fees for their services.

4.1.9. Summary

The conceptual framework is a modification of the traditional structure-conduct-performance model which presumes a direct relationship between market structure and performances. The modification has mainly arose from the various critics forwarded in the model as well as the gaps observed in the literature review. The basic structure model is criticized for its lack to clearly explain the association between concentration and performances that created for the emergence of divergent views. One of the heated debates that remained still unresolved is the efficiency-structure contest. In addition, it assumption related to bank conduct as a given variable to be derived from industry concentration as well as it's presumption on a unidirectional relationship between concentration-conduct- performance attracted strong criticism . The review on literature also shows that there are diverse factors beyond structure that can have a bearing on performances but previous works have not adequately made an exploration. The modified conceptual framework considers all the above factors and intended to establish a comprehensive view on bank performances. The proposed framework is rich in terms of structure as well as non-structure related variables having exhaustive considerations for concentration, efficiency, regulation, bank specific, industry and macroeconomic variables. Furthermore, the framework has clearly charted the flow of the banking operation in order to easily point out the variable to be applied in the empirical test. The variable selection which is based on the derived conceptual framework and the exhaustive literature reviews is further supported by an interview experience with bank managers and regulatory staff. In addition, a review on recently functional regulatory instruments and policy frameworks to guide the sector growth, maintain prudential banking practices and manage risks are incorporated in the framework to assist in the variable selection. It has also added some of the factors along with the variables, like bank conduct which qualitatively are explored in the analysis part of the study. The framework therefore is designed in a way not only to provide evidence on concentration-performance relationship, but also test the multifaceted variables from banks, regulation, industry and macro- economy having implication on bank performance.

CHAPTER FIVE

RESEARCH DESIGN AND METHODOLOGY

5.1. Introduction

This chapter discusses in detail the methodological choice and the research design process of the study. It has mainly relied on the philosophical stance and the research problem to guide on the methodological choice. More, specifically, it explains why explanatory sequential mixed methods research approach is considered appropriate for the research. In addition, the chapter set the procedures to collect, analyze and report data. It has used separate procedures for the quantitative and qualitative approach as both encompass distinct purpose to serve. Besides, the approaches implemented to enhance the validity and reliability of the studies are also explained in detail. Finally, the chapter defines procedural issues of the research including the timing, weighting and integration decisions of the study along with pointing considerations for ethical issues.

5.2. Research Design

A research design is the '*procedures for collecting, analyzing, interpreting and reporting data in research studies*' (Creswell & Plano Clark 2007, p.58). It is the overall plan for connecting the conceptual research problems with the pertinent (and achievable) empirical research. In other words, the research design sets the procedure on the required data, the methods to be applied to collect and analyze this data, and how all of this is going to answer the research question (Grey, 2014). As explained by Robson (2002), there are three possible forms of research design: exploratory, descriptive and explanatory. His base of classification relies on the purpose of the research area as each design serves a different end purpose. For instance, the purpose of a descriptive study is to provide a picture of a situation, person or event or show how things are related to each other and as it naturally occurs (Blumberg, Cooper and Schindler, 2005). However, descriptive studies cannot explain why an event has occurred and is much suitable for a relatively new or unexplored research area (Punch, 2005). Therefore, in situation of abundant descriptive information, alternative research designs such as explanatory or exploratory approach is advisable.

Exploratory research is conducted when enough is not known about a phenomenon and a problem that has not been clearly defined (Saunders et al., 2007). It does not aim to provide the final and conclusive answers to the research questions, but merely explores the research topic with varying levels of depth. Therefore, its theme is to tackle new problems on which little or no previous research has been done (Brown, 2006). Even in the extreme case, exploratory research forms the basis for more conclusive research and determines the initial research design, sampling methodology and data collection method (Singh, 2007).

On the other front, an explanatory study sets out to explain and account for the descriptive information. So, while descriptive studies may ask 'what' kinds of questions, explanatory studies seek to ask 'why' and 'how' questions (Grey, 2014). It builds on exploratory and descriptive research and goes on to identify actual reasons a phenomenon occurs. Explanatory research looks for causes and reasons and provides evidence to support or refute an explanation or prediction. It is conducted to discover and report some relationships among different aspects of the phenomenon under study.

As defined in previous section, the main objective of the study is to explore the relationship between industry concentrations with bank performance. To achieve this, it draws statistical, quantitative results and further seeks to provide justifications on the established relationship with qualitative study. Therefore the pertinent research design obviously is explanatory type that responds to both the how and why aspect of the fundamental research question. The below section points out further rationale for selecting the explanatory research design in this study: Philosophical stance and objective of the study.

5.3. Research Design of the Study

5.3.1. Philosophical Stance

Philosophical assumptions/paradigms are described as a cluster of beliefs that dictates what should be studied, how research should be done and how the results should be interpreted (Bryman, 2008). In short, they are general orientations about the world the researcher holds (Creswell, 2009). Lincoln and Guba (1985) claim that a paradigm contains the researcher's assumptions about the manner in which an investigation should be performed, i.e. (methodology), as well as his / her definition about truth and reality, i.e. ontology and how the investigator comes to know that truth or reality, i.e., epistemology. Therefore, the methodological choice of a researcher is determined by the philosophical assumptions about ontology/ human nature and epistemology (Collis and Hussey, 2003)

5.3.1.1. Ontology and Human Nature

Ontology is concerned with the *'nature of reality and the assumptions researchers have about the way the world operates and the commitment held to a particular view'* (Saunders et. al., 2007, pp. 110). Therefore, with regard to the ontological assumption, the researcher must answer the following question: what is the nature of reality? (Creswell, 1994). Ontology consists of *'the ideas about the existence of and relationship between people, society and the world in general'* (Eriksson and Kovalainen, 2008, pp.13). There appear two polarized view points of ontology: the objectivism and subjectivism or constructionism (Grey, 2014). An objectivist view on ontology asserts that social reality has an existence that is independent of social actors, hence, the world is external Carson et al., (2001) with a single objective reality to any research phenomenon or situation regardless of the researcher's perspective or belief (Hudson and Ozanne, 1988). Therefore, one can discuss social entity, in the case of both organization and culture, as something in the same way that physical scientists investigate physical phenomena (Johnson and Onwuegbuzie, 2007). According to this school of thought, human beings, who are a product of the external reality to which they

are exposed, only work as responding mechanisms with limited involvement as investigator of social reality (Morgan and Smircich, 1980).

In contrast, truth and meaning do not exist in some external world, but are created by the subject's interactions with the world (constructivism) or emerge from through imposition of the object by the subject (subjectivism) (Grey, 2014) Therefore, subjectivists or constructivists reject the objectivist view, and treat social reality as a projection of human imagination (Morgan and Smircich, 1980). With regard to the role of investigators, human beings are expected to be able to attach meanings to the events and phenomenon that surround them, and be able to shape the world within their perceptions and experience about it (Gill et.al, 2010). However, these views on reality and human beings are polarized, therefore, allowing different ontological assumptions between the two extremes. For instance, Collis and Hussey (2003) have classified the various ontological assumptions as a continuum to reflect reality as: a concrete structure; a concrete process; a contextual field of information: a realm of symbolic discourse; a social construction; a projection of human structure.

The study adopts a mixed outlook between the two extreme views of reality: objectivism and subjectivism. With a belief that there exists a natural or physical world which to some extent can be investigated through structured ways with considerable role of human beings as social actors to interpret and modify their surroundings. The study theme which is establishing a casual effect between structure and performance is, therefore, derived from the exiting reality in the social world having an objectivist orientation. In addition, the study also recognizes the important contribution from the social actors more specifically of the people who are related to this phenomenon, bank managers and regulators. Such contribution from bank experts adds to better understand the realities in the outside world thorough their perception and interpretation of the relationship between bank concentration and performance and providing meaningful interpretation for the established relationship

5.3.1.2. Epistemology

Epistemology is a study of knowledge and is concerned with what we accept as being a valid knowledge (Collis and Hussey, 2003). In other words, an epistemological issue concerns the question of what is (or should be) regarded as acceptable knowledge in a discipline (Bryman,2004). In terms of epistemological undertakings, the two fundamentally different but competing thoughts are: positive (realism) epistemology and phenomenological (or normative, interpretive) epistemology (Bryman, 2004).

Positivism, as a research paradigm, seeks to solve major practical problems, search for law-like generalizations, and discover precise causal relationships through statistical analysis (Kim, 2003). Positivism claims that the social world exists externally and that its properties should be measured through objective measures, where observer must be independent from what is being observed. Since there is just one reality, this reality can be expressed by the variables and measured reliably and validly (Onwuegbuzie, 2002). Therefore, the researcher should focus on facts, locate causality between variables, formulate and test hypotheses (deductive approach), operationalize concepts so that they can be measured and apply quantitative methods (Easterby-Smith et.al. , 2002).

Unlike positivism, phenomenologists hold that any attempt to understand social reality has to be grounded in people's experience of that social reality (Grey, 2014). Therefore, the focus will be on meanings, trying to understand what is happening, construct theories and models from data (inductive approach) through qualitative methods (Easterby-Smith et.al. ,2002). Researchers in this case interact with what is researched, and try to minimize the distance between themselves and what is researched (Collis and Hussey, 2003).

The epistemological stance in this study is a cradle from the mixed view of ontological assumption. The study acknowledges that knowledge as a construction is based on the reality of the world where human beings experience and live (Johnson et. el., 2007). Knowledge in fact is gained through both investigating the nature of relationships

among phenomenon and by understanding the role of human beings playing in the social reality (Morgan and Smircich, 1980). The positivist position, therefore, appears relevant in establishing knowledge through the cause-effect relationships. In this study, the researcher assumes that there are some realities which exist in the world that may affect the performance of banks. It mainly considers the link between industry concentration and other factors with performance of banks so as to observe the nature of relationship. In addition, the phenomenologist viewpoints concerning the need to search for meanings through different views of phenomenon appear relevant. This is because the study is not only a hypothesis testing exercise but also seeks to provide explanation on the 'why' aspect of the causal relationship and provide recommendations on improvements. It basically aims to develop meaning from the established casual relationship through in-depth analysis of the views from bank experts and regulatory staff.

5.3.2. Objectives of Research

The choice of research design depends on the objectives of the research in order to be able to answer the research questions in research problem (Crotty, 1998). The research problem is an issue or concern that needs to be addressed. In such regard, this study aims to test the pertinent theories related to industry concentration though establishing a causal link between measures of concentration and performance. The theory test also incorporates direct measures of efficiency as done in some previous literature to examine the concentration vs efficiency debate. Moreover, the assessment extends to incorporate the effect of identified control variables on performance measure. Therefore, explanatory study appears the best option in search for such kind of casual research among others (Saunders et.al, 2003). The emphasis of this research design is on studying a situation or a problem in order to explain the relationship between variables or to test whether one event causes another (Creswell, 2003). Therefore, the researcher argues that explanatory design is the proper research design to address the central and subsidiary questions of the study.

The framework of assessment of this research is based on already developed theory, the SCP framework, which is a widely used theory in the empirical work to test the concentration-performance relationship. Therefore, the main intent of the study is to find out the stated relationships in the SCP framework with priority to develop a better understanding of the phenomenon in the Ethiopian banking industry. Therefore, a choice for explanatory design is appropriate because the design is the best approach to use to test a theory or explanation (Morse, 1991).

This design is also most useful to assess trends and relationships with quantitative data but also be able to explain the mechanism or reasons behind the resultant trends (Creswell, Plano Clark, et al., 2003). One of the critics on the concentration-profitability relationship is related to variation in the interpretation of the research output. For instance, there appears long staying debate between the views of the market power and efficiency scholars. The efficient market hypothesis claim that the larger market shares which lead to a high level of concentration are a result of better efficiency and lower costs rather than a low level of competition (Demetz,1973). However, despite the controversies in the interpretation of the results, previous literature has devoted considerable effort to assess the relationship through quantitative approach. Therefore, based on current knowledge, it is likely that the researcher can apply a quantitative approach to answer the main research question by testing the relationship between bank performance and concentration. However, one of the factors that limit quantitative empirical research in this regard is that it doesn't allow the researcher to have an in-depth explanation about the situations in the study (Ibid). Besides, some of the variables in the research question require to be addressed by qualitative approach. Therefore, the quantitative result should be supported by qualitative input from industry experts. This is a widely accepted use of the explanatory design which is well suited to a study in which a researcher needs qualitative data to explain significant (or non-significant) results, outlier results, or surprising results (Morse, 1991).

Given the above considerations, the researcher follows an explanatory mixed method research design that combines both quantitative and qualitative methods to investigate the price-concentration relationship in the Ethiopian banking situation.

5.4. Research Approach

Broadly speaking, there are three approaches or methods to conducting research: qualitative methods, quantitative methods and mixed methods (Creswell, 2003; Creswell & Plano-Clark, 2007; Teddlie & Tashakkori, 2009). As this research study involves collecting and analyzing both quantitative and qualitative data, a mixed methods approach is implemented to address the research questions. The explanation for the approach selection is as follows:

5.4.1. Mixed Research

A mixed method study involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the research process (Gutmann & Hanson, 2002). In other words, the approach helps the researcher answer questions that cannot be answered using only qualitative or quantitative methods alone. Mixed methods provide a more complete picture by noting trends and generalizations as well as in-depth knowledge of participants' perspectives.

In this study, a quantitative approach is applied using a panel data of the banking sector in order to test the concentration- performance relationship as well as the link among other internal and external factors with bank performances. The findings on the quantitative research are supplemented by a qualitative approach aimed to drive an in-depth explanation on the quantitative result. Each phase of the stated approach is explained hereunder:

5.4.1.1. Quantitative Phase

Aliaga and Gunderson (2000), describes quantitative study as a research approach explaining a phenomena by collecting numerical data that are analyzed using statistical approaches. It is an approach in which the investigator employs strategies of inquiry such as experiments and surveys and collects data on predetermined instruments that yield statistical data (Creswell, 2003). The greatest strength associated with quantitative research is that its methods produce reliable and quantifiable data that can potentially be generalized to a large population (Marshall, 1996). In addition, it is suitable to test and validate already constructed theories about how and why phenomena occur through testing hypotheses that are constructed before the data are collected.

In the study, the quantitative method is applied to confirm or refute the central research question and other separate specific research questions as follows:

The central research question reads as, *‘ how do industry concentration and performance are related in the Ethiopian Banking system?’*

From the nature of study and previous literature works, it is obvious that the central research question demands a quantitative answer. The SCP approach uses a model that examines whether a highly concentrated market causes collusive behavior among large banks and whether it improves market performance. Usually, literature applied a multiple linear regression model to test the SCP hypotheses. The regression model which started with a simple regression approach to establish a relationship with concentration and profitability has subsequently improved to consider several variables. An improvement in such regard is the approach used by Simrlock (1985) who re-modified the model to incorporate both market share and concentration measures so as to test the relationship between concentration and profitability. In order to interpret the findings correctly, Smirlock (1985) introduced an additional regressor, however, still interpreting and calculating managerial and scale efficiencies appear a complicated task (Berger 1991). For instance, the relationship between market share and profitability was

considered as an indication in favor of the scale-efficiency hypothesis by some scholars (Simrlock, 1985) and x-efficiency by others (Berger, 1991).

The recent research trend is widely following the Berger and Hannan (1991) model who tackled the above problem by explicitly incorporating two efficiency indicators, which measure the X-efficiency and scale efficiency of banks, as explanatory variables in the regression equations. In addition, two market structure indicators, which are proxied by measures of industry concentration and market share, are included in their model.

This study also follows the approach of Berger and Hannan (1991) to test the central research question. Therefore, conclusions drawn from the analysis of quantitative data indicate which of the two contrasting theories better represent the phenomenon in the Ethiopian Banking sector. In other words, the quantitative approach provides a response on whether better performance of banks is associated with market power or is related to superior performance of banks with high market share.

There are also sub research questions that are examined through the quantitative component of this thesis, which is specified as follows:

- *RQ1: How do bank efficiency relate to bank performance?*
- *RQ2: Is there efficiency variation among banks operating in Ethiopia?*

As explained above, the Berger and Hannan (1991) is a result of interpretation difference on the effect of concentration on performance. The model provides explicit definition on and measures for the X-efficiency and scale efficiency of banks. This study applies the Data Envelopment Analysis to estimate the score of banks in each efficiency categories. The estimated efficiency scores are then used as regressors in the multiple linear regression models in order to observe the relationship between efficiency and performances.

To address the questions related to the efficiency variance among banks, a quantitative approach utilizing various descriptive and inferential statistical tools is also established. Relying on the scores of the DEA, both parametric (analysis of variance and t-test) and non-parametric (Mann-Whitney[Wilcoxon Rank-Sum] and Kolmogorov –Smirnov tests are used to test whether there is an efficiency variation among banks having differing ownership structure. Moreover, descriptive statistics such as, mean, maximum and minimum efficiency scores are determined in order to investigate the efficiency level and variation among banks.

As set in the conceptual framework, the link between performance and the identified control variables is examined through a quantitative research approach. The research questions related to the control variables integrated in the study comprise:

- *RQ3: How do bank specific factors relate to bank performance?*
- *RQ4: How do external (sector and macroeconomic) factors relate to bank performance?*
- *RQ5: What is the impact of regulation on bank performances?*

The variables in each sub questions are either measured based on the extent literature or originated from the banking practices and regulatory framework instituted in the Ethiopian banking system.

In sum, the quantitative approach appears suitable to provide answers to the above mentioned central and sub research questions of this study which are basically quantitative. Moreover, as it has been justified in the research design and the next section, the qualitative study supports the quantitative approach in an attempt to seek more explanation and interpretation.

5.4.1.2. Qualitative Research

Qualitative researches are designed to provide the researcher a means of understanding a phenomenon by observing or interacting with the participants of the study (Denzin & Lincoln, 2008). Therefore, qualitative researchers are interested in exploring and/or explaining phenomenon as they occur in the natural setting. This

means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (Newman & Benz, 1998). One of the greatest strengths of qualitative methods is that they have the potential to generate rich descriptions of the participants' thought processes and tend to focus on reasons "why" a phenomenon has occurred (Creswell, 2003).

The qualitative component of this study involves undertaking in-depth interviews with bank managers and regulatory staff to provide response to the following sub research question:

RQ6: How do banks respond to the prevailing market structure (bank conduct)?

The empirical studies employing the SCP model, which are highly dominated by quantitative approach often fail to allow for banks' market conduct explicitly (Bikker and Haaf, 2002(a)). Instead, they treat it as being determined by structure. However, later critics have pointed out that the conduct variables are being considered among few variables which the SCP failed to consider. The qualitative analysis in this study is justified not only from the importance of including such variable in the evaluation but is also from its helpful contributions that include: first, providing useful comparison on banks' perception of their conduct in the market against the conduct deduced from the quantitative result as suggested by the SCP model. Second, bank conduct studies are also helpful in testing some of the managerial behaviors in concentrated banking industry like Ethiopia. For instance, Hicks (1935) quiet life hypothesis asserts that in a concentrated market firms do not minimize costs, because of insufficient managerial effort, lack of profit-maximizing behavior, wasteful expenditures to obtain and maintain monopoly power, and/or survival of inefficient managers (Berger & Hannan, 1998). Therefore, firms and managers choose 'a quiet life' which result in a negative correlation between market power and managerial efficiency. Even if such behavior can be statistically inferred from the SCP model, the qualitative approach provides an in depth look on some of the behaviors of managers in concentrated (or otherwise) banking

market. Third and most importantly, whenever there appears an attempt to include measures of conduct on the quantitative model, only few variables (e.g. advertising expense or selling expense etc.) which can provide a partial look on bank conduct are utilized. This is mainly related to the qualitative nature of some of the variables that may explain bank conduct and is due to lack of public information even in some of the quantifiable conduct parameters. Therefore, the researcher argues that since lack of information on variables related to conduct to a certain extent limits the generalization of the quantitative studies, a qualitative approach to answer and support the quantitative result should be employed.

This study intends to pursue the qualitative approach through interviewing both bank managers and regulatory staff. Bank managers are essential participants who directly involve in determining the conduct of their banks in their decision making. In addition, Bank regulators are the one who enact directives to guide the conduct of banks and determine the structure of the industry. Therefore, by collecting interview data from the two groups of participants, the qualitative part of this thesis is likely to provide a better comprehensive picture on concentration-performance relationship than previous studies.

5.5. Research Methods

5.5.1. Quantitative Data Collection and Analysis

Considering the central and supplementary research questions, the researcher has two options to collect the quantitative data. The first is to conduct survey on selected issues related to concentration, efficiency and profitability in the Ethiopian banking context. This method has an obvious advantage of conducting the study at different banks and incorporating diverse opinions of the bank community. However, this approach is not reflected in almost all studies of the SCP paradigm due to the dominance of analysis relying on publicly available data. In addition, it appears difficult to test the effect of some quantitative based variables such as concentration, efficiency, and other control variables on the dependent variables (either price or profit). Under the circumstances,

the researcher had to consider another option of data collection, that is, using secondary data that have been disclosed by banks and other concerned entities. Almost all of the prior studies related to SCP have employed quantitative empirical studies employing data from a public database, annual reports and other resources to conduct an empirical study on the relationship between structure and bank performance. Therefore, following the approach of previous studies, this study relies on publicly available secondary data to conduct a quantitative study. This is justified on the ground that most of the variables in the study are quantitative in nature and can be measured from bank databases and economic data therefore in such situation opting for survey remains time consuming, cost ineffective and inappropriate. On the other front, the availability of the data from publicly disclosure sources is supported by two phenomenon: Firstly, commercial banks in Ethiopia are obliged to publicize their financial records such as the balance sheet, income statement and cash flows on annual basis (commercial code, 1960). Secondly, data aggregation problem is solved due to the application of a consistent account closing date (fiscal year) which begins at July 1st and closed at June 30 of each year. On top of this, material difference on the accounting principles used by banks is not observed as most banks are utilizing the historical based accounting system during financial reporting. But there is a recent move from the regulators for banks to report their financial records using International Accounting Standard (IAS). Therefore, data aggregation problem within banks might not be practically difficult. The researcher has also tested the accessibility of data from the public sources. It has found out that some banks have already posted their recent financial records through public channels (such as annual reports, and company websites, etc.), which recently emerged as an obligation for the banks (SBB/62/2015 Bank Corporate Governance). For missing records of prior year historical financial records, the National Bank of Ethiopia has an aggregate data of the industry from 1990 to the recent year which is comfortably accessible. For the control variables, data are abundantly available from the records of the NBE annual report, Ministry of Finance and Economic Development (MOFED), Ethiopian Economic Association (EEA), Central Statistical Agency (CSA).

The study, therefore, uses a panel data set having both cross-section and time components. Besides, firm level (individual banks)) as well as aggregate data of the industry and the macro economy are implemented to test relationships and hypothesis. The sources for bank related data are the various annual publications and financial accounts of NBE and the Commercial banks. For macro-economic data, the study utilizes publications (including the annual report) which are collected by Central Statistical Authority of Ethiopia (CSA), Ministry of Finance and Economic Development (MoFED), Ethiopian Economic Association (EEA) and NBE's annual reports. Moreover, literature review has consulted materials from academic books, journals, magazines, internet resources and other related research paper and reports as shown in the reference section. In such regard effective use of UNISA repository is made. Various directives and circulars of the NBE and proclamations guiding the commercial business are also reviewed so as to set variables and review on the legal framework of the Ethiopian banking system. Recently published materials by the government like the Growth and Transformation Plan (I and II) are also exhaustively consulted in order to explore the future banking growth path as demanded by policy setters.

5.5.2. Justifications on the use of Panel data

Panel data refers to data sets consisting of multiple observations on each sampling unit. This could be generated by pooling time-series observations across a variety of cross-sectional units including countries, states, regions, firms, or randomly sampled individuals or households (Baltagi, 2001). Kennedy (2008) pointed that panel data have more variability and allow to explore more issues than do cross-sectional or time-series data alone. Baltagi (2001, pp.6) puts, *'panel data gives more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency.'*

The type of data used in this study is panel data for 17 years (1999-2015) and 18 banks, which therefore, combines both time series and cross-sectional data. The main purpose of using panel data is to increase the number of observations (the sample

size). In the Ethiopian case, there are only 18 commercial banks. The average stay in the market for these private banks as a whole is only 11 years. The first private bank started operation in 1994 after the 1990's liberalization measure recording a maximum stay in the industry for 21 years. Therefore, even considering the maximum stay of the private bank, the sample size is not large enough to carry out powerful statistical analyses. For instance, a robust time series analysis requires a minimum of 30 years observation. In this case, panel data enables the researcher to apply certain statistical techniques in this study. According to Baltagi (2001), panel data usually gives the researcher a large number of data points by combining both cross section and time factors. A panel data set contains n entities or subjects, each of which includes t observations measured through t time period. Thus, the total number of observations in the panel data is nt for strictly balanced data set. The study with 17 years observations for 18 banks have a total of 198 observations (unbalanced data) which is much better as compared to only 17 observations had a time series analysis is selected. Aside from this reason, panel data gives '*more informative data, more variability, less collinearity among variables*' (Gujarati and Porter, 2009 p.592), compared with time series or cross-sectional data. In addition, panel data allows controlling for omitted (unobserved or mismeasured) variables.

The time series of panel data in the current study begin from fiscal year 1999s and ends in 2015. This is for the reason that:

- 1990s is the time when the financial liberalization measures were started to be introduced in the banking and other financial sectors. The year 1999 is the time when a reasonable number of private banks were formed and commenced operation.
- financial liberalization measures were accompanied by the entry and establishment of privately owned banks which might expect to influence the industry structure.
- the current industry structure appears to take shape after this point time (1999 onwards) from the long stayed full ownership the banking system by publicly owned banks which were run under the command economic system regime.

Therefore, with 17 years of time series data coupled with 18 banks, is assumed to provide the study with a rich input from 1988 observations.

5.5.3. Sampling Techniques-Quantitative

The unit of analysis used in the current study is drawn from the population of commercial banks operating in Ethiopia. The study utilizes census approach with purposive exclusion of a bank operating with non-commercial motive. This is due to the small number of commercial banks operating in Ethiopia, which is only 18 as of 2015 (NBE quarter report, 2015). The number of banks after 2016 however is even reduced to 17 after the government decision to amalgamate the two state owned banks into one. The choice is also reinforced by the study's intent to observe variations across banks in terms of ownership and year of stay in the industry. The study also aims to observe the changes in structure overtime and with the inclusion or entry of new banks in the sector.

5.5.4. Data Analysis and Hypotheses Testing

5.5.4.1. Analysis of Quantitative Data

a. Model Specification

Various regression models are established to quantitatively test the research questions in the study. For instance, the model that tests the concentration-performance relationship is framed in a way to incorporate both structural and efficiency measures. The approach used is following the work of (Berger and Hannan, 1998) which directly incorporates efficiency measures so that the four hypotheses can be tested jointly and in way to avoid spurious regression. The four hypotheses are :

1. The SCP hypothesis – which claims that higher profits are the result of anti-competitive price settings in concentrated markets (measured by an industry concentration index like HHI and k-bank ratio)
2. The Relative Market Power hypothesis (RMP) -which states that firms with large market shares are able to exercise market power (measured by market share of

banks) to earn higher profits. The difference between SCP and RMP is that the latter need not occur in concentrated markets.

3. The X-efficiency hypothesis (ESX)- firms with superior management or production processes operate at lower costs and subsequently reap higher profits. The resulting higher market shares may also lead to higher market concentration. X-efficiency as measured by the result from the DEA scores.
4. The Scale-Efficiency hypothesis (ESS) - firms have similar production and management technologies but operate at different levels of economies of scale. Firms operating at optimal economies of scale will have the lowest costs and the resulting higher profits will lead to higher market concentrations. Scale efficiency as measured by DEA scores. Both versions of the efficient- structure hypothesis provide an alternative explanation for the positive relationship between profit and market structure.
5. In addition a test for Hicks (1935) 'quiet life' hypothesis- This hypothesis predicts a reverse causation, that is, as firms enjoy greater market power and concentration, inefficiency follows not because of non-competitive pricing but more so because of a relaxed environment that produces no incentives to minimize costs.
6. A test on competitiveness of the Banking sector- is done through running a lag of the dependent variables.
7. A test on the control variables - a separate assessment on control variables based on their categories is done through formulating a regression model for the purpose.

Therefore, the model used to test the four hypotheses is set as:

$$P_{it} = f(\text{lag } P_{it}, \text{Conc}_t, \text{MS}_{it}, \text{XEFF}_{it}, \text{SEFF}_{it}, Z_{it}) + e_{it} \dots \dots \dots (5.1)$$

where :

- P_{it} , is a measure of performance of bank i , on time t ,
- $\text{lag } P_{it}$ - one period lag of the dependent variable
- Conc. is a measure of market concentration for given year
- MS is market share of bank i ,

- *XEFF* is a measure of cost efficiency, indicating the ability of banks to produce a given level of output at minimum cost combination,
- *SEFF* is a measure of scale-efficiency, reflecting the ability of banks to produce at optimal output levels (economies of scale) for given similar production and management technology,
- *Z* is a set of control variables of bank *l* on time *t* and
- *e* is random error term.

Extensions to the basic model and contribution of the research

- Following the divergence in the literature over profit and priced based performance measures, this study considered both aspects of bank performance measures.
- The control variables incorporated diverse factors from the industry, macro-economy, regulatory and the specific banks.

Therefore, the model could be framed in modified form:

$$P_{it} = f(\text{lag } P_{it}, \text{Conc}_t, \text{MS}_{it}, \text{XEFF}_{it}, \text{SEFF}_{it}, \text{EX}_{it}, \text{REG}_t, \text{BS}_t) + e_{it} \dots\dots\dots(5.2)$$

Where: *ME*- external factors (macroeconomic and Industry factors) and *BS*- Bank specific factors and *REG*- regulatory factors.

b. Efficiency Measures

The efficiency measures are estimated by using non-parametric technique called Data Envelopment Analysis (DEA). The DEA model is a methodology for analysis of the relative efficiency for multiple inputs and outputs by evaluation of all decision-making units (DMUs) (Charnes et. al., 1978). The DEA measures efficiency performance in respect to the best practice banks, which is called efficient frontier. Some of the most important advantages of the DEA methodology, includes the lack of restrictions on the functional form, the different variables and values (e.g., ratios) which may be used, the possibility of measuring those variables in different units, and the fact that any deviations from the efficiency frontier are noticeable (Thanassoulis, 2001). However, it is sensitive to extreme observations and choice of variables as inputs and outputs.

The study uses both the CCR and BCC models and their divisional output to compute for the scale effect or scale efficiency. CCR-model was developed by Charnes, Cooper and Rhodes (Charnes et. al. (1978). Its specific assumption is that the DMU operates under constant returns to scale (CRS). BCC-model was defined by Banker et. al., (1984). It estimates the efficiency under the assumption of variable returns to scale (VRS).

The basic DEA problem to estimate the relative efficiency of each bank is given by:

$\theta^* = \text{Min } \theta$ subject to

$$\sum \lambda_j x_{ij} \leq \theta x_{io} \quad i= 1,2,\dots,m$$

$$\sum \lambda_j y_{rj} \geq y_{ro} \quad r= 1,2,\dots,s$$

$$\sum \lambda_j = 1$$

$$\lambda_j \geq 0 \quad j= 1,2,\dots,n$$

Where x_{io} and y_{ro} are the i -th input and r -th output of the Bank under evaluation, respectively and θ is a bank-specific scalar that varies between zero and one and conveys the efficiency score of the specific bank. Banks with $\theta_i = 1$ their input-output mix lies on the efficient frontier. The λ_j is an $N \times 1$ vector of bank-specific weights that conveys information on the benchmark comparators for bank i . A modification of the model with addition of the convexity constraint, $\sum \lambda_j = 1$ allows to compute efficiency under variable returns to scale (VRS) and disentangle technical efficiency from scale efficiency. The VRS model thus envelops the data more tightly and provides efficiency scores that are equal or greater than those of the CRS model (Banker et al., 1984).

DEA differs from a simple efficiency ratio in that it accommodates multiple inputs and outputs and provides significant additional information about where efficiency improvements can be achieved and the magnitude of these potential improvements. Moreover, it accomplishes this without the need to know the relative value of the outputs and inputs that were needed for ratio analysis (Cooper, Seiford & Tone, 2000). However, DEA is also subject to few limitations. DEA assumes data to be free of

measurement error and that it is sensitive to outliers. Coelli et. al., (2005) also point out that having few observations and many inputs and/or outputs will result in many firms appearing on the DEA frontier.

The study uses the DEA to compute the efficiency score of banks and the aggregate industry. The estimated DEA efficiency scores (for both X and scale efficiency) are then used as regressors in a second-stage model in order to observe the relationship between efficiency and profitability. In addition, the scores are used to test whether there is efficiency variation among private and state owned banks.

c. Market Concentration Measures

Literature usually uses the top k-firms concentration ratio (CR_k) and the Herfindhal-Hirschman Index (HHI) to measure the market power.

i. K- firm (bank) Concentration Ratio

The concentration ratio is the percentage of market share held by the largest firms (k) in an industry. It shows the degree to which an industry is dominated by a small number of large firms or made up of many small banks. There is no rule for the determination of the value of k, so that the number of banks included in the concentration index is an arbitrary decision (Al-Muharrami, 2007). The higher the ratio, the more concentration in the banking sector providing the largest market power to big banks in the industry. The index approaches zero for an infinite number of equally sized banks and it equals unity, if the banks included in the calculation of the concentration ratio make up the entire industry. It takes the forms:

$$CR_k = \sum M_{si} , \text{ where } M_{si} \text{ is the market share of the } k\text{-banks}$$

The concentration ratio indicates the relative size of k-large firms in relation to their industry as a whole. Normally 4-firm and 8- firm concentration ratios are used

conventionally which assists in determining the market form of the industry. However, it ignores many small banks in the market (Wesman, 2005). In highly concentrated industry even a one bank concentration ratio results in a meaningful result. Based on the interview findings and the situations in the Ethiopian banking system, the study employs a one bank concentration ratio to measure the level of industry concentration.

ii. Herfindahl Hirschman Index (HHI-index)

The index was originally proposed and used in the field of industrial economics by Herfindahl (1950) and Hirschman (1964) independently of each other. The HHI is the most widely treated summary measure of concentration in the theoretical literature (Bikker and Haaf, 2000a). Unlike CR_k which only indicates the relative size of the largest k-firms, the HHI accounts for the number of firms in a market, as well as concentration, by incorporating the relative size (that is, market share) of all firms in a market. It is calculated by squaring the market shares of all firms in a market and then summing the squares, as follows:

$$HHI = \sum_{k=1}^n (Msi)^2$$

Where n is the number of banks in the banking sector, Msi is the market share of the bank k, k = 1, 2, ..., n.

HHI ranges from a number approaching zero to 10,000. Low concentration is indicated by HHI value of less than 1,000 and HHI of 10,000 implies high concentration, a case of pure monopoly. HHI includes all firms in the calculation. This means that more data needs to be collected. Squaring of the individual market shares of the firms gives proportionately greater weight to the market shares of the larger firms. Lack of information about small firms is not critical because such firms do not affect the HHI significantly (U.S. Department of Justice and Federal trade Commission, 1992).

d. Variables

The purpose of the quantitative component of this study is to investigate the concentration-performance association as well as interactions among different control variables. The previous similar quantitative empirical studies have utilized most commonly used measures depending on publicly accessible data and the context of the country of study. This study also follows similar approach but additionally supported by the interview experience in selecting more reliable potential indicators. Therefore, during the process of identifying proxies, variables reflecting the unique characteristics of the Ethiopian banking industry have got strong focus. The main variables to be analyzed in the study as explained in the previous section and during the analysis:

1. Those that explain the performance of banks (Return on Assets, Return on Equity and Net Interest Margin) are used as dependent variable in all models.
2. Those related to the market structure applying various measures of market concentration such as the top k-firms concentration ratio (CR_k) and the Herfindhal-Hirschman Index (HHI). Hence the market shares of banks in either or combined variables such as deposit and loan are utilized.
3. Those related to efficiency- based on the intermediation approach, a DEA is run in three inputs (deposit, branch, fixed asset) and two outputs (loans and other earning assets) with their corresponding prices for both inputs and outputs. Based on the stated inputs cost, revenue and profit efficiencies are computed.
4. Control Variables that fall under the control of the management are set based on the CAMEL framework. External factors consisted of factors from the macro economy and industry (such as GDP growth, inflation, trade deficit, bank size , market growth, exposure to low cost deposit). Finally regulatory factors that are taken from the currently active regulatory framework are included. These include exchange rate, interest rate, entry capital, bank entry, reserve ratio, liquidity requirement, bill purchases).

The detail discussion on the variable setting is made in the conceptual framework as well as the analysis on each part of the control variables.

5.5.4.2. Hypotheses Testing

The research employs the following procedures in order to test the various hypotheses in the study. The procedure is a multi-stage process consisting of:

1. Employing DEA to get efficiency score on XEFF and SEFF
2. Measuring the market concentration and market share variables
3. Running the multiple regression model incorporating the concentration, efficiency extracted from the DEA and control variables.
4. Testing the Hypotheses for concentration-performance, efficiency-performance, quiet life and competitiveness.
5. Test on the control Variables from internal, external and regulatory factors

All the equations are estimated using panel data regression which allows differences in behavior across individual banks or overtime. Various variants of the panel data model: pooled ordinary least square (OLS), fixed effect and random effect are considered and various tests such as the F-test and Lagrange Multiplier (LM test) are applied to test for fixed and random effect, respectively and decide on applying the pooled OLS. A Hausmann test for fixed and random effect is employed to identify the optimal model in case of rejecting the OLS model.

5.6. Reliability and Validity in Quantitative Research

5.6.1. Reliability

Joppe (2000, p.1) pointed that ‘... *an accurate representation of the total population under study is referred to as reliable if the results of a study can be reproduced under a similar methodology...*’. Reliability, by definition, refers to the extent to which studies can be replicated. In order to satisfy the criterion of reliability in a piece of research – no matter it is quantitative or qualitative – it is important for the researcher to document the research procedure explicitly (Kirk and Miller, 1986). This is what Franklin and Ballan

(2001) called the '*audit trail*', which is important to provide a basis for checking the researcher's dependability.

Therefore, the study documents:

- the employed research methods and the overall research design (including diagram presentation to show the explicit flow);
- the dependent and independent variable measures;
- the procedure for sample setting and the source of data used in the quantitative analysis;
- the data analysis and hypothesis testing procedures;
- the assumptions in the model and variable setting procedures;

The study also relies on publicly available secondary data sources which are audited or else published by responsible government offices. Before running the data in the model, the data character is observed through descriptive statistics and graphical observations. In addition, the required tests such as panel unit root test are employed to test for stationarity of the panel and time series variables.

5.6.2. Validity

Generally, there are three key types of validity in a quantitative study:

A. External Validity- refers to the extent to which the findings of a particular study can be generalized across populations, contexts and time (Dellinger and Leech, 2007). The quantitative study of this thesis appears to have less threat to external validity. This is because of low problem in data availability, sample size (census is used) and the quality of data (which is audited). More importantly, the study is a piece of mixed methods research in which the combination of qualitative and quantitative studies has the potential to achieve triangulation which is one of the important ways to enhance external validity (Bryman, 1988). This study examines the relationships among concentration and bank performance using both quantitative statistical technique and qualitative

interpretation and description. By doing so, it is possible to achieve consistency in some findings, and thus increases the external validity of the overall research. In addition, the use of census in the quantitative research (which is a dominant research approach) enhances the generalization of result.

B. Internal Validity- is conceptualized as the degree to which the researcher is confident about the conclusion/inferences of the causal relationship between variables/events (Tashakkori and Teddlie, 1998). In a hypothesis testing study, internal validity is normally pursued through complex statistical procedures that enable control over extraneous variables (Johnson et. al., 2007). In this study, the assumed relationship between dependent variable and independent variables is based on theoretical foundation and the findings of empirical work. Several control variables that impacts the dependent variable are also introduced into the models following empirical works, regulatory standards, interview experiences and the business pattern of Ethiopian banks. Moreover, several statistical instruments are used to test the robustness of the estimated results and the assumptions in the regression model based on (Guajarati, 2003):

1. Normality of the residuals or errors
2. Linear relationship between the independent and dependent variable(s)
3. Homoscedasticity- equality of variance of the errors.
4. No autocorrelation between the disturbances
5. There is no perfect multicollinearity

Therefore, the model is tested for the above stated assumptions.

i. Model Diagnosis

a. Tests for Normality

The hypotheses used in testing data normality are based on the data distribution that tests for:

Ho: The distribution of the data is normal

Ha: The distribution of the data is not normal

If a test does not reject normality, this suggests that a parametric procedure that assumes normality (e.g. a *t*-test) can be safely used. In addition to the formal tests for normality, data is also graphically examined.

b. Tests for Linearity

The ANOVA table contains tests for the linear, nonlinear, and combined relationship between variables. The hypotheses used in testing data normality are:

Ho: There is no linear relationship between variables,

Ha: There is linear relationship between variables.

If the test for linearity has a significance value smaller than 0.05, this indicates that there is a linear relationship. Alternatively, a graphical approach is used to observe plots for linearity. Linearity is displayed by the data points being arranged in the shape of an oval.

c. Test for Multicollinearity

This is carried out using the analysis of the Variable Inflation Factor (VIF) statistics. Small inter-correlations among the independent variables is expressed with $VIF \approx 1$. However, $VIF > 10$ depicts collinearity is a problem.

$VIF = 1 / \text{tolerance}$, where $\text{tolerance} = 1 - R^2$, R^2 is the coefficient of determination.

In addition, correlation analysis is conducted to examine for multicollinearity problem.

d. Autocolleration

To test for the existence of autocolleration, the Durbin Watson test is employed. This module tests correlations between errors and assumes that the error terms are stationery and normally distributed with mean zero. The test statistic can vary between 0 and 4 with a value of 2 indicating that the residuals are uncorrelated. A value greater than 2 indicates a negative correlation and a value less than 2 depict a positive correlation.

The Hypothesis to be tested is then:

$$H_0 = \rho_s = (s > 0)$$

$$H_1 = \rho_s = p_s \text{ for some non zero } p \text{ with } |p| < 1$$

e. Heteroskedasticity

The test of the presence of heteroskedasticity, the Breusch-Pagan/ Cook-Weisberg tests is employed. This test involves testing the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables.

$$H_0 = \text{Var}(u/x_1, x_2, \dots, x_n) = E(u) = \sigma^2$$

$$H_1 = \text{Var}(u/x_1, x_2, \dots, x_n) = E(u) \neq \sigma^2$$

The null hypothesis is true when the model is homoscedastic. If the alternative hypothesis is true, the model is heteroskedastic.

C. Construct/content Validity – Construct validity threat arises when investigators use inadequate definitions and measure variables based on those inadequate definitions (Modell, 2005). In this study, the threats to construct validity is limited as it forwards explicit definition for each variable via setting a conceptual framework as well as before running the model. Moreover, the use of multiple methods is likely to reduce the threats to the construct validity. The indicators used in the quantitative analysis are further examined in the qualitative interviews so as to check the accuracy of the definition of indicators.

5.7. Qualitative Data Collection and Analysis

Data for qualitative studies can be collected from different sources of evidence, including documents, archival records, interviews and so forth (Yin, 2003). In this study, an in-depth interview is conducted to collect qualitative data on the quantitative findings. In addition, this is complemented by a review of documents such as directives, legal codes, the country growth plan and other pertinent materials guiding the bank's structure and conduct.

5.7.1. Interview

Interviews provide in-depth information pertaining to participants' experiences and viewpoints of a particular topic (Grey, 2014). Thus, it is very suitable for this study to get rich and detailed information about market structure, efficiency, regulations etc. from practitioners' viewpoints. More specifically, as discussed in the previous section, the interview is helpful in the variable setting process and answering sub-questions in the study. Besides, the information from interview is used to justify some of the relationships in the quantitative result.

As common with quantitative analyses, there are various forms of interview design that can be developed to obtain thick, rich data utilizing a qualitative investigational perspective (Creswell, 2007). These include the three fundamental types of research interviews: structured, semi-structured and unstructured. In this study, interview questions are designed to be semi-structured as they allow the study to be benefited from both structural and unstructured approach. The structured nature provides key questions that help to define the areas to be explored, hence, ensuring cross-case comparability (Bryman, 2004). On the other front, the unstructured approach allows the researcher and/ or the interviewee to diverge constructively in order to pursue an idea in more detail (Gill et. al., 2010).

With such background, two sets of interviewees, namely, bank senior managers and bank regulators are selected in order to provide a comprehensive picture on the objective of the study. The variables adopted in the quantitative models as well as those that qualitatively explored are used to formulate the interview questions (see annex).

5.7.2. Interview Participant Selection

Interviewing individuals from a variety of perspectives has the potential to enhance the credibility of findings (Rubin, J and Rubin, S, 2005). Therefore, two sets of interviewees, namely, bank managers and bank regulators are selected in order to provide a

comprehensive picture of bank structure, regulation, performance, conduct, environmental factors and efficiency aspects. This is mainly because bank senior managers are believed to be those who have broad knowledge about their bank's strategies, policies, and business practices. They are also the ones being involved in different aspects of decision making and strategic choices on their bank. Besides, they also are better aware about the industry situation and the regulatory environment in the Banking context. Thus, it is expected that they have better ability to understand the research problem than those non-managerial staff. Similarly, bank regulators who are guiding and regulating the banking sector are chosen as they are specialists with much broader knowledge and understanding about bank regulation and policy setting. Therefore, the study employs purposive sampling techniques to select interview participants.

5.7.3. Sample Size

The sample considered in the study consists of 18 interviews that were conducted with participants of bank managers and regulatory staff. The interview is conducted with managers of 7 commercial banks and 4 Central Bank staff. Of the commercial banks, one is from a state owned bank and the remaining six are from private owned banks. The representation for state owned commercial banks is 100% as the recent merger decision from the government (while the study is in progress) has amalgamated the two stated owned banks.

In essence, qualitative interviews are conducted to explain and explore phenomena in depth to discover new constructs, themes and relationship. Considering the similarity of bank behavior in Ethiopia, the sample of 18 bank experts and regulators remained adequate enough to reach saturation levels. Alvesson and Skoldberg (2010) define saturation during interviews as the point when no new data is revealed by further collection of data since all the questions asked have been exhausted by the initial qualitative interviews. The sample selection considers the historical formation time of banks and their ownership structure. The private banks are taken following a purposive

sampling approach and in a way to represent both middle and recent entrant banks following the following strata:

- Private banks that operated in the industry for more than a decade and whose asset size is above Birr 5 million: banks under this category are those that emerged after the financial reform measure and mainly of the measure that allowed the participation of the private ownership in the banking sector)
- Small size banks with asset size less than Birr 5 million and stayed in the industry form less than a decade: These banks are small in size and are relatively short-lived in the sector.

Hence, based on the above classification, bank experts working for government owned bank (CBE which amalgamated with CBB), middle size private banks and small size private banks are considered for the research. Three middle size and three small size bank managers are interviewed. Input from managers having a diversified skill set such as those working as risk, planning and research and bank operation managers is obtained. Comparably the interview with bank regulator staff is with those who are in a team leader position.

5.7.4. Qualitative Data Analysis

The data collected from interview is analyzed through thematic data analysis through examining and recording patterns (or themes) within data. It is performed through drawing a meaningful explanation on the pertinent subject from the responses of the banking experts. Some of the responses are quoted and presented in the analysis part. The variables adopted in the quantitative analyses of this thesis are guided to structure the analysis of the quantitative findings. In addition, as set in the conceptual framework, variables that convey conduct such as price competition, advertising and marketing practices, branch network and quality competition, information gathering, expenses preference behavior , risk avoidance etc are used in the analysis structuring process.

5.7.5. Reliability and Validity in Qualitative Research

Denzin & Lincoln (2005), state that the issues of validity and reliability are important in qualitative research. However, they are treated in a different manner as there are no intentions to establish a quantitative measure of validity and reliability (as in the case of quantitative research). Stenbacka, (2001) viewed reliability as '*purpose of explaining*' in quantitative approach and '*generating understanding*' in qualitative approach to research. Owing to the desire to differentiate itself from quantitative research, qualitative researchers have espoused the use of 'interpretivist alternatives' terms (Seale, 1999). For instance, Lincoln & Guba (1985) suggested that the most suitable terms in qualitative paradigms are credibility, neutrality or confirmability, consistency or dependability and applicability or transferability. This study uses the suggested names by Lincoln and Guba together with preferred names for quantitative analysis so as to solve the confusion in this regard.

A. Reliability/Dependability

Saumure & Given (2008) recommended that dependability can be addressed by providing a rich description of the research procedures and instruments used so that other researchers may be able to collect data in similar ways. In addition, researchers may address dependability by conducting a new study on participants with similar demographic variables, asking similar questions and coding data in a similar fashion to the original study (Firmin, 2008). Therefore, it can be inferred from the above that clearly stating the demographic of the variables and research questions used to collect data and the coding techniques should be explained clearly.

In this study, therefore, to ensure reliability:

- the interview procedure (the timing, content, etc.) and the data analysis process is discussed clearly;
- the profile of interviewees is explained in detail;
- the interview questions used to collect the data from interviewees are clearly prepared and incorporated in the annex part of the report;

- detailed note in which each interview session is held is included but attempt to record the interviews is not allowed as participants' were not willing to do so;
- During the data collection process, efforts were made to reduce errors and bias. In this regard, before closing the interview sessions, the researcher tried to check the accuracy of the data by discussing the points taken on the note with the participants and getting their feedbacks.

B. Validity

i. External Validity (Transferability)- emphasizes the generalization of the research findings. It is easy to understand generalization in a quantitative study. However, the claim about generalization in qualitative research is more problematic due to the small samples often used in qualitative studies (Johnson et. al., 2008). The major intent of the qualitative part in this study is to explain the findings on the quantitative result. Therefore, as Bryman (2004, p. 285) argues, *'the findings of qualitative research are to generalize to theory rather than to population.'*

The external validity of this study can be enhanced through the following ways:

- Purposive sampling allows the researcher to select the cases that represent the feature of the researcher interested in (Silverman, 2001). The interview participants are mainly those that can contribute well to the study; therefore, the selection is purpose rather than random. This ensures to collect the opinion of bank experts and regulators who are expected to be knowledgeable on the research theme.
- The study investigates data from multiple cases gathered from different banks, therefore, reliance on few cases to explain a scenario from the quantitative result is avoided. The case selection is done to incorporate different bank groups segregated via ownership and year of stay in the industry. Bryman (2004) suggests that studying more than one case is a helpful solution to improve generalization in qualitative research.

- The study also has diverse opinion on the central and subsidiary research questions from the perspectives of both bankers and the regulators. The use of two sets of interviewees, therefore, is helpful to enhance validity. Parry (1998) argues that gathering multiple perspectives on the same incident can help to moderate the negative impact of single sources on research validity.

ii. Internal Validity (Credibility) - Internal validity in qualitative research refers to the extent to which the observations and measurement represent the social reality (LeCompte and Goetz, 1982). It is concerned with the research methodology and data sources used to establish a high degree of harmony between the raw data and the researcher's interpretations and conclusions. McMillan & Schumacher (2006) suggest list of strategies to increase validity in qualitative research paradigm of which those associated with credibility includes: accurately and richly describing data, citing negative cases, using multiple researchers to review and critique the analysis and findings and conducting member checks.

In this study, therefore:

- the researcher examines carefully the inferences drawn from the qualitative data by adopting the thematic analysis (classifying the qualitative inputs into various themes) to guide the discussion of results.
- unexpected concepts and controversial issues from one interview session are discussed with other interview participants. The research follow-up for surprises rather than dismissing them, and took into consideration rival explanations and possibilities and tests if all participants have the same views about the theme/s that occur.

iii. Construct validity (Conformability) - it refers to establishing correct operational measures for the concepts in both quantitative and qualitative studies (Yin, 2003). In other words, the researcher should ask the question: *'am I truly measuring /recording what I intend to measure /record rather than something else?'* (Tashakkori and Teddlie, 1998). Researchers may address conformability through the use of multiple coders, transparency, audit trails, and member checks.

In the qualitative study, the researcher's subjectivity and bias existing in the data analysis process pose a significant threat to the construct validity. In this thesis, it might not be feasible to use multiple coders technique to reduce researcher bias. However, the researcher rechecked the inferences drawn from the interviewees' opinion and audit trial on the collected data including connecting the result to existing literatures.

5.8. Procedural Issues in the Study

The study uses both qualitative and quantitative approaches which benefit the study from triangulation and complement each other. The qualitative approach in this study is mainly conducted to follow up findings from quantitative data, to select variables and to help in understanding what the figures actually mean. As Patton (1990, p. 132) has suggested, "qualitative data can put flesh on the bones of quantitative results, bringing results to life through in-depth case elaboration." Therefore, as in any mixed-methods design, the issues of priority, implementation and integration of the quantitative and qualitative approaches should be clearly stated (Creswell and Plano Clark, 2007). More specifically, decision on the following issues should be explicitly stated: the sequence of the data collection and analysis, the priority or weight given to the quantitative and qualitative study, and the stage /stages in the research process at which the quantitative and qualitative phases are connected and the results are integrated (Ivankova et. al., 2006; Creswell and Plano Clark, 2007).

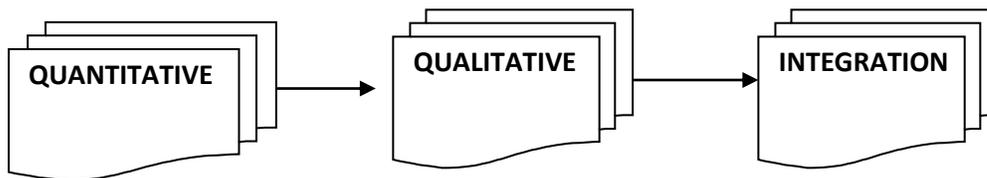
5.8.1. Implementation (Timing) Decisions

The implementation aspect relates to the decision whether the quantitative and qualitative studies come in sequence (one following another), or concurrently (Ivankova et. al., 2006). Different answers to this question result in two ways of designing mixed methods research: concurrent (also referred to as parallel) or sequential study (Tashakkori and Teddlie, 1998; Creswell and Plano Clark, 2007). Studies using the explanatory design take place in two sequential phases, with the quantitative data

collection and analysis occurring first and usually providing the overall emphasis of the study (Creswell, Plano Clark, et al., 2003). In addition, if the research purpose is to seek explanatory or development by combining quantitative data and qualitative data, then the sequential design is more likely to be chosen (Creswell and Plano Clark, 2007).

The study adopts a sequential design as the main purpose of the research is to quantitatively test the relationship between concentration and performance and further probe the quantitative findings through qualitative data so that a broader explanation of the phenomenon is secured. First, quantitative data is first analyzed and relationship established. This is then followed by a qualitative study to seek further explanation on the findings. The results from the two studies are integrated to ensure complementarity and triangulation.

Figure 5.1: Timing Decisions for this Study



Source: Author's framework

5.8.2. Weighting (Priority) Decisions

Weighting refers to the relative importance or priority of the quantitative and qualitative methods to answering the research questions (Creswell and Plano Clark, 2007). The research may give equal weight to quantitative and qualitative methods, or may weight them unequally (Creswell and Plano Clark, 2007). As stated in the definition above, the decision of choice between the two approaches mainly relies on their influence to address or answer the research questions. The study therefore obviously provides priority to the quantitative approach. The main and subsidiary research questions of the study can be answered through forming a casual relationship between selected variables and the qualitative aspect is aimed to explain (not to test the relationship) the

quantitative result. Moreover, the study's primary intention is to test the already framed theory in the Ethiopian banking context and has no intention to develop a new theory on concentration-profitability relationship. In such a situation, the quantitative study is more important in terms of understanding the relationship among variables stated in the theory. In addition, the qualitative result is demanded to deeply assess the phenomenon from the quantitative findings considering expert opinions from commercial banks and regulatory side. The availability of data and a framework from the literature to quantitatively test relationships between concentration and firm performance also supports the priority choice in this study from practical consideration.

5.8.3. Integration (Mixing) Decision

Integration refers to the stage or stages in the research process where the mixing or integration of the quantitative and qualitative methods occurs (Tashakkori and Teddlie 1998; Creswell et. al., 2003). Without explicit relating of the two methods, a study will be simply a collection of multiple methods rather than a real and strong mixed methods design, even if it includes both quantitative and qualitative study (Creswell and Plano Clark, 2007). As Bazeley (2009) points out, integration of conclusion is commonly seen in mixed methods research, *'but blending data or meshing analyses has been much less common'* (Bazeley,2009, p.204). Therefore, quantitative and qualitative data should be integrated not only at the stage of results reporting, but also during the processes of data collection and analysis in order to maximize the integration of the two methods.

This study also follows an integrated framework between the quantitative and qualitative methods at each stage of the data collection, analysis and reporting.

- **Data Collection-** the quantitative data is collected from publicly available resources (including annual reports, websites, the NBE etc). The quantitative data then forms the base to formulate interview questions. On the other side, the input from the qualitative data is used to refine the pre-set interview questions as well as to confirm or amend proxy measures employed in the quantitative study.
- **Data Analysis-** the theme development process in the qualitative approach relies on the indicators used in the quantitative model. Also, the findings from the

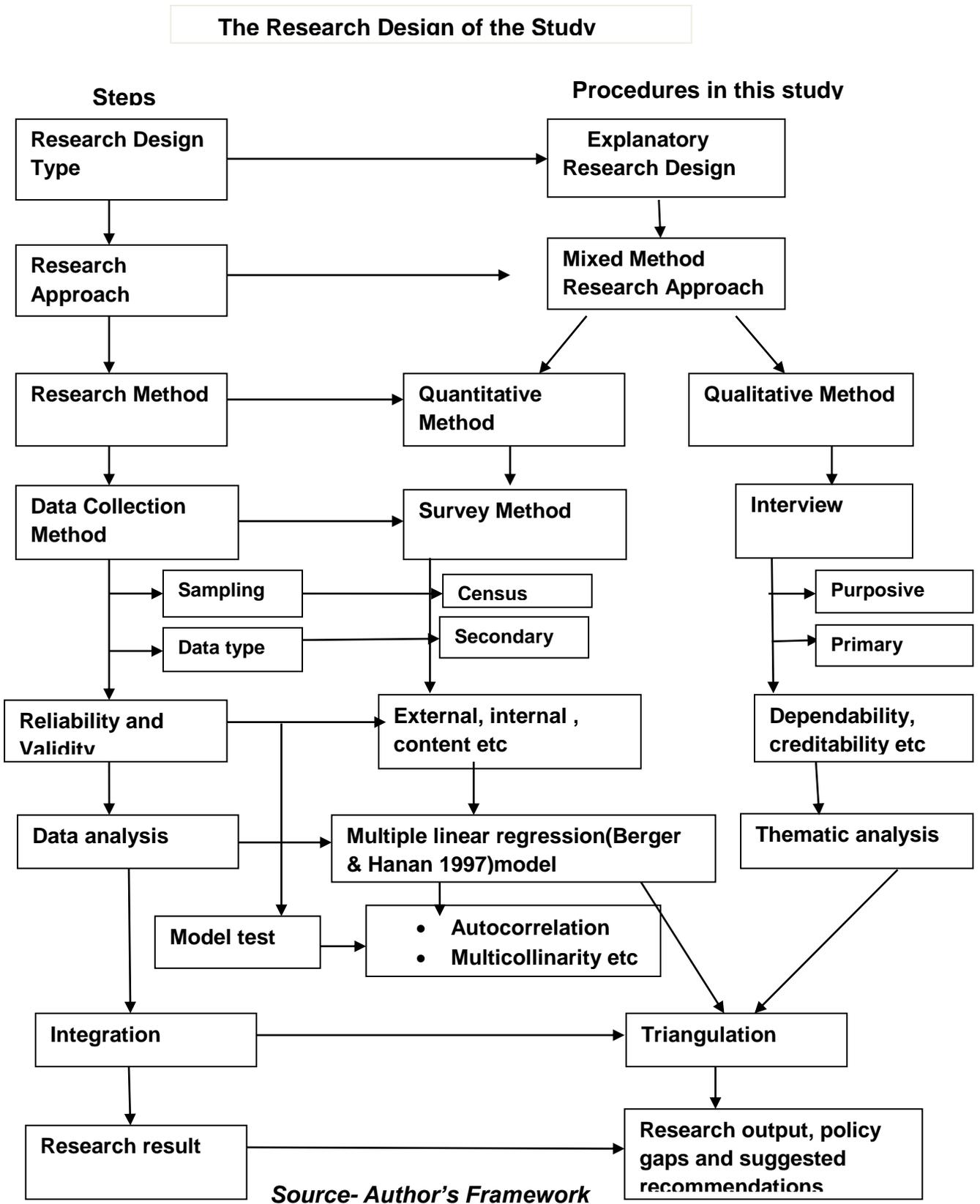
quantitative study are consumed to provide meaningful interpretation to the quantitative result with the purpose of triangulation.

- **Final outcome of the entire study-** the quantitative and qualitative approaches are mixed so that the integrated result provides answer to the research question of the study. The findings from separate assessment on the quantitative study and qualitative study are further compared and connected.

5.9. Ethical Issues

Before engaging in data gathering, the researcher has secured an ethical clearance from the Ethics Committee of the UNISA. In addition, it has collated informed consent from each of the banks and participants in the interview witnessing their approval of participation in the study. During such process, the participants are informed the purpose of the study and confirmed the confidentiality of their responses. This includes briefings for non- disclosure of individual identity and their liberty from any liability or risk arising from the study or the response. The study has taken inputs from the interested participants only and explained participants right to withdraw at any time when felt inconvenience of participation. All bank documents or part thereof including manuals, policy, procedures etc...are kept confidential and will not be disclosed to third party in any form. The study acknowledges all contributors to this study and provides proper credits to those scholars immediately and list of references is also attached. At most effort is also exerted to keep the study free from bias, abuse, misconduct and fraudulent acts and practices.

Figure 5.2 The Research Design of the Study



5.10. Summary

The chapter set detail framework for the methodological decision of the research. It has pointed a mixed philosophical stance that gave birth to mixed research design. Not only the philosophical stance; the chapter discussion follows a research approach for to address each of the research questions from the problem statement. The study finds that an explanatory sequential mixed research approach as a pertinent approach to meet the objective of the research. In addition, the approach ensures the validity of the overall research and provides the benefit of triangulation and complementarity.

It has also set the procedures to collect, analyze and report data. It has used separate procedures for the quantitative and qualitative approach as both have distinct purpose to serve in the study. The quantitative study relies on secondary data sources which are publicly available and are less prone to the risk of data aggregation. Census approach and panel data frameworks are the sampling and data frame of the quantitative study that consists of 18 banks for 17 years of observations. The qualitative study which is sample based in terms of bank and participant selection consists of state owned bank, three middle size banks as well as three small banks. Data for qualitative study is from the interview experience with 18 bank experts and regulatory staff. The data analysis for the quantitative study is based on statistical analysis and hypothesis testing on selected variables from the conceptual framework, the literature review and interview findings. The qualitative study is analyzed through establishing themes and inferring the responses of the participants which some of them are presented in the analysis part as instances.

The chapter also defined the implemented procedural issues explicitly where the study follows a sequential approach from quantitative to qualitative study. It has also pointed the stages of integration of both studies, the approach followed to enhance validity and reliability of the studies as well as the progressive steps to secure ethical clearance from UNISA and the manner of addressing the ethical issues.

CHAPTER SIX

QUANTITATIVE ANALYSIS

6.1. Introduction

This section of the study consists of the quantitative analysis that examines a panel data set of the banking sector following four steps. The first step investigates the relationships between industry concentration and efficiency variables with performances. In such endeavor the efficiency scores for bank level and industry wide performances are computed applying the Data Envelopment Analysis (DEA). The level and variation in efficiency among bank groupings was done. In addition, the competitiveness, determinants of efficiency and test for quiet life are conducted by following a statistical rule for variables relationship. The second step focused on exploring the relationships between bank specific factors and performance measures and follows the CAMEL framework. Similarly, the interaction among external factors (industry and macroeconomic variables) with bank performances is conducted in the third step. The fourth step looked at relationships between regulation and financial performance. Subsequently the quantitative study brings the industry concentration, bank specific, external and regulatory factors in a combined model. A rank regression on the combined is developed to test the robustness of the models and its sensitivity to extreme values.

6.2. Testing the Impact of Industry Concentration on Bank Performance

The next section describes the efficiency level and variation in the Ethiopian banking industry with a detail review on efficiency variation across bank types under different scales of operations. In addition to meeting the objective in the above, the result from such assessment provides inputs to the investigation on the central question of the study. This section of the study explores the relationship between concentration measures revealing market structure with bank performances. The model constructed investigates the market power situation in the banking system against its level of impact on both price and profitability measures with a fundamental motive of examining the

structure-conduct- performance relationship in the Ethiopian banking system. The model constructed examines the central question and main hypothesis of the study: H_0 : market structure has no impact on the performance of banks. The above hypothesis further used to determine which of the stated hypotheses related to market power and efficiency best explained banks' performance. The testable models are built based on the extant literature, interview experience as well as data availability. Multiple least square regression technique is employed to test the constructed models using panel data. Moreover, various statistical analyses are carried out to test the robustness of some key models.

6.2.1. Model construction

In order to test the aforesaid relationship several models based on the theory of structure-conduct-performance has been employed. The model is basically estimated using a linear regression approach consisting of the following equation:

$$Per_{it} = \beta_0 + \beta_1 con_{i,t} + \epsilon_{i,t} \dots\dots\dots(6.1)$$

Where per_{it} = measures of performance (profitability/net interest margin), con = estimated coefficient for concentration applying the commonly used concentration measures such as HHI, k-bank concentration ratio.

The above model estimates a simple relationship between bank performances and concentration measures which is the basic model employed during the origination of a quantitative testing on market power and price relationship. Nevertheless, as shown in the literature review section, such approach has been criticized in several studies for the mere fact that it has a potential to lead in a different interpretation of the outcome. For instance, a positive outcome is construed in favor of the structure-performance relationship as claimed by the SCP hypothesis. However others consider it as a good indicator of the efficient hypothesis which asserts that the market concentration is a result of efficiency of large firms. Therefore, the interpretation variation has resulted in the inclusion of more variables to control for the interpretation differences. The

approach on top of the problem arose from the good work of Berger and Hannan (1993) that explicitly incorporated four variables, two efficiency indicators and two market power related, in their regression model as explanatory variables. The addition of the four explanatory variables not only resolved the interpretation difference but remained as a good cause for the emergence of four testable hypotheses: SCP, RMP, ESX and ESS whose interpretation is well articulated in the literature review section. Therefore, the above model further expanded incorporating the stated explanatory variables as shown below:

$$P_i = f(\text{lag } P_i, \text{CONC}, X\text{-EFF}_i, S\text{-EFF}_i, MS_i, Z_i) + e_i \dots\dots\dots(6.2.)$$

where P_i is a measure of performance, lag P_i- one period lag of the performance variable, X-EFF_i is a measure of X-efficiency, reflecting the ability of banks to produce a given bundle of output at minimum cost through superior management or technology, S-EFF_i is a measure of scale-efficiency, reflecting the ability of banks to produce at optimal output levels (economies of scale) given similar production and management technology, CONC. is a measure of concentration in market m, MS_i is market share of bank i in market m, Z_i is a set of control variables for each bank i, and e_i is an error variable for each bank i.

6.2.2. Model Variables

The independent and dependent variables are a direct derivatives of the four variables indicating market power and efficiency. A direct measure of efficiency scores describing the managerial and scale efficiency as it computed using the Data Envelopment Analysis (DEA) are further used to test the structure-performance relationship. This is supported by additional explanatory variables explaining market concentration (such as the HHI and CR) and market power (Market share). With regard to market structure, the study has given more preference to HHI as proxy of market concentration since; it considers the market shares of all firms in the market. Furthermore, other control variables which emerged from interview and the literature are used to build the model. The control variables have been incorporated to represent risk and ownership. The

definition and the expected relationship are framed based on the literature work and interview findings. These are displayed on the below table:

Table 6.1: Definition of Variables

Variables	Definition
Dependent	
ROA	ability of a bank's management to generate profits from the bank's assets
ROE	the return to shareholders on their equity
NIM	residual of interest income resulted from efficient decision making of management
Independent	
ROA t-1, RoE t-1, NIMt-1	One period lag of the return on assets, return on equity and net interest margin
LNDP	Measure of banks risk taking behavior
HHIDP	Measure of industry concentration level considering deposit market share of banks
HHILN	Measure of industry concentration level considering loan market share of banks
XEFF	Managerial efficiency level as produced in the DEA score
SEFF	Scale efficiency of banks as computed in DEA score
MSLN	Measures market power of each bank- considering loan market share
MSDP	Measures market power of each bank- considering deposit market share
OWN	Bank ownership type;1 for state banks and 0 for private banks

Source: Author's Computation

6.2.3. Data and Samples

The information about all variables is gathered from published financial statements of local commercial banks and the NBE database. The data collection is done for all banks in the industry spread over 18 cross -section (banks) and time period for 1999-2015. This has resulted in an unbalanced panel data set of 193 total observations. The bank efficiency scores are estimated based the DEA model applying the intermediation approach whose rationale of choice is explained in the conceptual model.

6.2.4. Descriptive Statistics and Trends

The model estimation follows a trend and descriptive statistics analysis on the selected variables. The two commonly used measures of profitability performances, RoA and RoE were all positive and large indicating the good profitability records of the banks in the industry. Variation wise a closer distribution is revealed if one considers the

standard deviation for RoA which indicates that even the most profitable bank is not far by more than 1 standard deviation from the mean profit record of the industry. Therefore, despite noted exceptions in some periods, the Banks capacity to generate profit from their asset holdings is almost comparable across banks. Nevertheless, the scenario could be reversed in case of RoE, where the variations reach 12 standard deviations. This witnesses the fact that there is variation across the industry in terms of their capital holdings as a buffer to potential risks and a cushion in case of liquidity problems. The situation also provides an indication on regulatory involvement in the relation to capital requirement which has been repetitively subjected to revisions to a growing level. The situation could potentially be aggravated due to the recent requirement from the regulator for banks to increase their capital level to Birr 2 billion regardless of the growth in their asset holdings. Such regulatory involvement therefore is enforcing some banks to hold excess capital as compared to their risk profile of the asset bases.

Table 6.2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
HHIDP	193	3524.59	7618.85	4830.5657	1137.04026	1.163	.175	.296	.348
HHILN	193	2054.50	6926.30	3867.1206	1161.66249	.941	.175	.654	.348
XEFF	193	.27	1.00	.8421	.12551	-.905	.175	1.904	.348
SEFF	193	.27	1.00	.9143	.11385	-2.306	.175	7.650	.348
MSLN	193	.16	82.76	9.0465	16.48154	2.991	.175	8.017	.348
MSDP	193	.12	87.09	8.8078	19.34728	2.973	.175	7.338	.348
OWN	193	.00	1.00	.1762	.38195	1.713	.175	.946	.348
ROE	193	.00	90.82	18.9962	12.87965	1.697	.175	6.461	.348
ROA	193	.00	5.25	2.2333	1.10661	-.312	.175	-.252	.348
NIM	193	.00	10.16	4.5473	1.80649	.265	.175	-.055	.348
LNDP	193	29.69	162.23	69.1821	21.34469	1.545	.175	3.762	.348
ROAT1	193	.00	5.25	2.2250	1.10573	-.294	.175	-.254	.348
ROET1	193	.00	90.82	18.9806	12.88018	1.701	.175	6.468	.348
Valid N (listwise)	193								

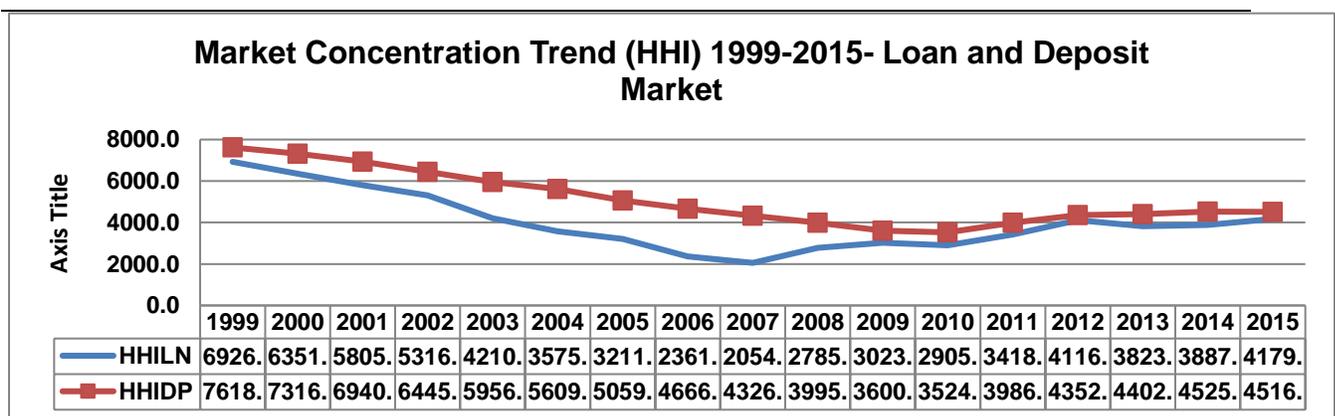
Source: Author's Computation (STATA 12)

On the other front, one of the price performance measures, the net interest margin shows that the net yield from earning asset holdings and specifically of the lending business is on the high side. The less variation record as witnessed by a standard deviation measure shows that the variation in earning due to price difference is not

material and doesn't affect the yield from earning assets. Therefore, price related competition seems not widely observed or is easily adjustable creating a convenience for banks to enjoy a high net positive yield from their exposure in interest yielding assets and interest bearing liabilities.

The industry concentration as measured by the Herfindahl Hirschman Index (HHI) on average stood at 4830 and 3867 in the deposit and loan market, respectively. The level stood in a high concentration range. The measure signals a high concentration scenario widespread across the banking system which will be a good starting point to explore further the effect of such market structure on performance of banks. Trend wise, the HHI has been in the decline path specifically during the period 1999-2007 which has reduced from 7618 to 4326 and later moved to the growth path due to the increased market share of the CBE. The gradual decrease in market position of the CBE following the entry of new private banks however shortly reversed due to the banks aggressive move to gain the lost market share in the past period. In addition, the good growth record of early entrant banks also contributed for the upward move in the concentration measure. Despite noted fluctuations in the HHI measure the recent period records show stability witnessing the fact that the contribution of recent entrants to the system has negligible effect to alter the market concentration towards diversifications. Therefore, in spite of the growth path trend in the private banking system, the market position of the big state owned banks remains unaffected and even has been growing at higher rate aggravating the market concentration.

Figure 6.1: Trend in Industry Concentration of Ethiopian Banks from 1999-2015

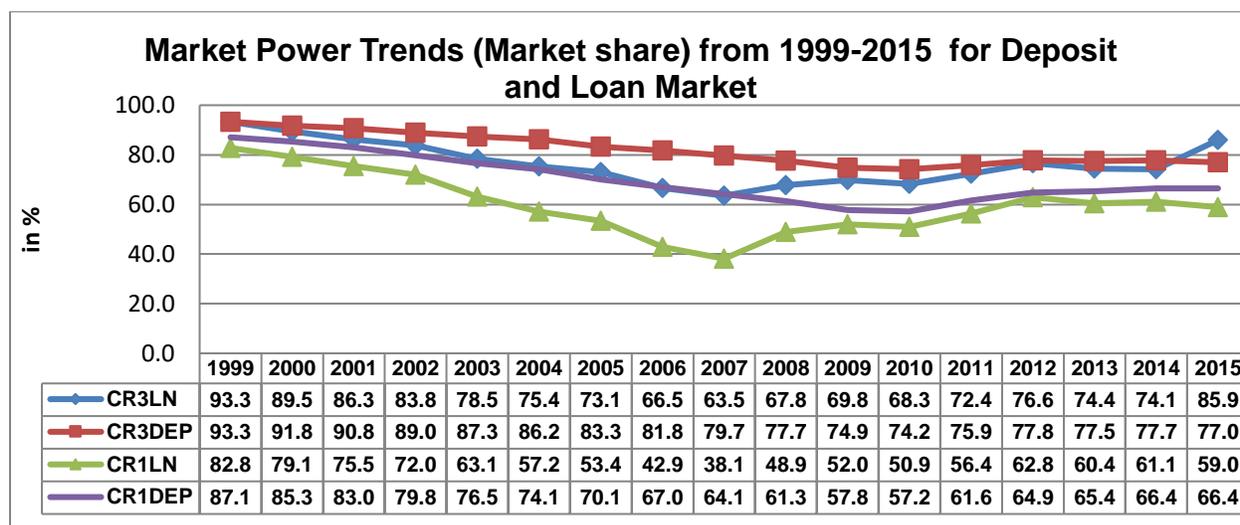


Source: Author's Computation

A separate view on each market also substantiates similar scenario, where the trend in the high rate of depletion in the loan market concentration during past periods due to strong performance of the private sector, has now remained sluggish. The trend even is growing at a higher rate narrowing the wider gap observed as compared to the concentration at the deposit market.

Similarly, on the market power front, the three bank ratio shows that around 76% and 84% of the loan and deposit market, respectively, is taken by the top three banks. In other words the other 15 banks shared only 24% and 16% of the loan and deposit businesses, respectively. The finding is in line with the HHI measure and witnesses a high concentration/market power scenario which is exceptionally high even as compared to other banks in Africa (for instance, Fosu(2013) find the five bank concentration ratio of African banks to equal 71%). The ratio witnesses the existence of a high market power scenario that reign in the system if exploited could potentially lead to a market collusion situation that have implication on the competitiveness and performance of the industry.

Figure 6.2: Market Power Trends of Ethiopian Banks from 1999-2015



Source: Author's Computation

Trend wise, the share of the top three banks has been in decline at slower pace during the periods 1999-2007 with a shift towards incremental growth revealing an

instantaneous increment during the recent years. The trend observed is comparable in both markets with practical pronouncements in the loan market.

A separate review on the market power of the big bank applying the one bank ratio has not changed the trend and composition in market trend. The above shows that the change in trend and market power position observed in the banking system is much a reflection of the market share rank of the big bank than the other additions to the system. This provides a good justification for the usually cited argument for the prevalence of state dominated banking system or a dominant bank scenario in the Ethiopian banking system.

As can be observed in the upcoming section, the managerial efficiency measure, XEFF, is on average 84% showing that with the existing level of activity, some banks could have been more productive just by increasing their managerial and technological capacities. Correspondingly, the descriptive statistics on scale efficiency shows an improved efficiency level of the banking system (mean 91%) as compared to the managerial efficiency (84%). The variation observed, however, is significant in most cases witnessing the existent of banks in the system which could have improved performances through operating at suitable scale of operation. The detail on efficiency score is shown in the next section.

The dummy variable, ownership type carries a value of 0 for private banks and 1 for state owned ones. The descriptive statistics for the dummy variable on average is closer to zero due to the existence of more number of private than public banks. The measure of banks risk taking behavior, Loan to Deposit ratio (LNDP), confirms that intermediation business has remained as a core engagement of the banking system. The average LNDP witness that deposit conversion in the form of loans has been strong over the periods and lending remained as the core activity of banks. Further look at on the risk taking behavior of banks also skewed towards a high risk taking initiatives as reflected in a heated intermediation business even sometimes lending exceeding resource mobilization endeavor. Furthermore, the level signals the high demand for credit in the

industry which eased the conversion of deposits to loans. The high risk taking behavior perhaps will not be a surprise considering the limited areas of engagement for banks due to the underdeveloped financial system and lack of other supporting markets. Nevertheless, the variation in such variables is strong still explaining the difference in risk taking behavior and the tendency of some banks to make a shift towards other channels of businesses for earning.

Additional variables to measure the level of competition were also incorporated in the model through systematically adding their one period lag of the dependent variables. The lag in profitability ratios, $RoAt-1$, and $RoE t-1$, have comparable statistical behavior with the basic variables (without lag). The coefficient of the lagged dependent variable therefore represents the level of profit persistence. According to Berger et al. (2000), the persistence of profits in banks is the tendency of a firm remaining in the same profit distribution. This is because without market power, relatively high performance by a firm would be eliminated reasonably quickly as other firms enter its local market (Berger et al., 2000).

6.2.5. Pearson Correlation

The estimated correlation coefficients show that there is a very little correlation among variables included into the model. Furthermore, the correlation in most of variables is significant witnessing a genuine relationship among the explanatory variables. For instance, market concentration measures in loan and deposit markets have established a significant positive correlation with the efficiency measures. This remains in line with the previous analysis related to high efficiency performance record of banks with significant market share holdings. The positive correlation among ownership and concentration also relates with the better efficiency performance of state owned banks which are dominating the banking business as observed in their market share. Efficiency measures have revealed a mixed output with a noted significant and positive relationship of the scale efficiency with concentration and negative relationship with the x-efficiency measure. The above correlation among other strengths our argument for

the predominance produces of the scale efficiency to explain the efficiency variation among the different banking classes.

Table 6.3: Correlation Matrix

		Correlations ^c												
		HHIDP	HHILN	XEFF	SEFF	MSLN	MSDP	OWN	ROE	ROA	NIM	LNDP	ROAT1	ROET1
HHIDP	Pearson Correlation	1												
	Sig. (2-tailed)													
HHILN	Pearson Correlation	.841**	1											
	Sig. (2-tailed)	.000												
XEFF	Pearson Correlation	.111	.119	1										
	Sig. (2-tailed)	.124	.098											
SEFF	Pearson Correlation	.168*	.225**	.725**	1									
	Sig. (2-tailed)	.019	.002	.000										
MSLN	Pearson Correlation	.127	.064	-.175*	-.012	1								
	Sig. (2-tailed)	.078	.376	.015	.869									
MSDP	Pearson Correlation	.112	.051	-.189**	-.022	.987**	1							
	Sig. (2-tailed)	.122	.480	.009	.764	.000								
OWN	Pearson Correlation	.113	.052	.410**	.227**	-.061	-.090	1						
	Sig. (2-tailed)	.117	.474	.000	.001	.396	.214							
ROE	Pearson Correlation	-.257**	-.254**	.205**	.110	-.059	-.061	.318**	1					
	Sig. (2-tailed)	.000	.000	.004	.128	.416	.399	.000						
ROA	Pearson Correlation	-.401**	-.296**	.164*	.133	-.138	-.112	-.160*	.652**	1				
	Sig. (2-tailed)	.000	.000	.023	.064	.056	.120	.026	.000					
NIM	Pearson Correlation	-.161*	-.002	-.042	-.167*	-.108	-.109	-.218**	-.143*	.023	1			
	Sig. (2-tailed)	.025	.979	.565	.020	.136	.131	.002	.047	.752				
LNDP	Pearson Correlation	.184*	.092	.008	.016	.289**	.283**	.226**	.145*	-.052	-.171*	1		
	Sig. (2-tailed)	.010	.201	.907	.823	.000	.000	.002	.044	.474	.018			
ROAT1	Pearson Correlation	-.394**	-.275**	-.115	-.040	.037	.051	-.216**	-.079	.156*	.234**	-.209**	1	
	Sig. (2-tailed)	.000	.000	.110	.581	.607	.483	.003	.273	.031	.001	.004		
ROET1	Pearson Correlation	-.252**	-.240**	-.079	-.050	.018	.016	-.151*	.006	.060	.133	-.158*	.652**	1
	Sig. (2-tailed)	.000	.001	.273	.489	.804	.823	.036	.929	.409	.065	.028	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=193

Source: Author's Computation (SPSS 20)

An interesting relationship is also observed between banks' risk taking behavior, LNDP, with concentration measure which are significantly and positively related. The observed relationship suggests that banks with high risk exposure tend to contribute to

concentration through increasing their market share. The correlation remains significant considering the use of market concentration measures based on loan and deposit market share. On the other hand, bank ownership is not significantly correlated with concentration but remains significantly related with scale efficiency measures. In general, the correlation among explanatory variables is not to cause multicollinearity problems. As explained by Gujarati, 2003, if the pair-wise correlation between two regressors exceeds 0.8, a serious problem of multicollinearity will arise. Estimated pair-wise correlation coefficient for explanatory variables shows such relationships between HHIDP and HHILN. The study treats the two variables in separate models to explore the effect of each variables representing market concentration on performances. The other variables however have a lower correlation coefficient not to pose a multicollinearity problem. This will be further tested using the Variance Inflation Factor (VIF) in the subsequent section.

6.2.6. Model Pre-tests

6.2.6.1. Outliers and Missing Values

Outliers and missing values may have an undesirable influence on the estimates produced by the regressions. Therefore, before running the regression models a univariate statistics showing summary for missing and extreme values is computed. The result shows that there are no missing values that are likely to lower the quality of panel data, but the data for some variables holds extreme values. For instance, the univariate statistics of variables presented in the table below (Table 6.4) shows that there are six extreme values in the dependent variable, mainly related to the higher extreme. Therefore, in order to reduce the potential bias caused by the outliers, winsorized¹ through replacing the top and bottom values of by the value at the 5th and 95th percentiles respectively. Nevertheless, the study opted to retain the extremes observed

¹ There are different ways of dealing with outliers, such as winsorisation, exclusion, or retention. In this study, since the number of observations is not large, and the extreme values are likely to seriously bias the estimates, either exclusion or retention seems to be inappropriate. In this study, all winsorizing are done based on full sample rather than on balanced sample i.e. on the 193 cases.

in the concentration and market share as the measures reflect the real market structure development in the Ethiopian banking system.

Table 6.4: Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes ^a	
				Count	Percent	Low	High
HHIDP	193	4830.5657	1137.04026	0	.0	0	23
HHILN	193	3867.1206	1161.66249	0	.0	0	15
XEFF	193	.8421	.12551	0	.0	2	0
SEFF	193	.9143	.11385	0	.0	6	0
MSLN	193	9.0465	16.48154	0	.0	0	18
MSDP	193	8.8078	19.34728	0	.0	0	17
OWN	193	.1762	.38195	0	.0	.	.
ROE	193	18.9962	12.87965	0	.0	0	6
ROA	193	2.2333	1.10661	0	.0	0	1
NIM	193	4.5473	1.80649	0	.0	0	1
LNDP	193	69.1821	21.34469	0	.0	0	9
ROAT1	193	2.2250	1.10573	0	.0	0	1
ROET1	193	18.9806	12.88018	0	.0	0	6

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

b. . indicates that the inter-quartile range (IQR) is zero.

Source: Author's Computation

The obvious outlier in such regard is the significant market share holding of the big commercial bank (Table 6.4). Therefore, since the study's theme is to explore the impact of a dominant bank situation on performances, the identified extreme values on explanatory variables are retained.

6.2.6.2. Unit root test

The fisher options ADF panel unit-root test is computed to mitigate the impact of cross-sectional dependence(Levin, Lin, and Chu,2002) The main advantage of using the test is that the test can handle unbalanced pane l(longitudinal)s and the lag lengths of the individual augmented Dickey-Fuller tests are allowed to differ(Choi, 2001) . The Fisher-type test uses p-values from unit root tests for each cross-section with the hypothesis of Ho: All pane l(longitudinal)s contain unit roots and Ha: At least one panel is stationary. The test rejected the null hypotheses. The Fisher-type test uses p-values from unit root tests for each cross-section with the hypothesis of Ho: All pane l(longitudinal)s contain

unit roots and H_a : At least one panel is stationary. The test rejected the null hypotheses as shown in Table 6.5 below:

Table 6.5: Fisher Type Unit Root Test

Variables	Lag	p-value	Inv chi-squared
RoA	0	0.0000	204.1
RoE	0	0.0000	114.7
HHID	0	0.000	133.5
HHILN	0	0.0009	62.7
MSLN	0	0.0003	67.1
MSDP	0	0.0004	125.4
XEFF	0	0.0000	149.2
SEFF	0	0.0000	297.3
<i>Ownership</i>	<i>0</i>	<i>0.0000</i>	<i>1.000</i>
<i>LNDP</i>	<i>0</i>	<i>0.0000</i>	<i>74.7</i>

Author's Computation

6.2.7. Regression results

6.2.7.1. Hausman Test

Both the F-test and the LM test with large chi-square result rejects the null hypothesis, hence, the fixed and random effect models appear better than pooled OLS. The Hausman test taking the coefficients of the fixed and random models supported the null hypotheses that H_0 : difference in coefficients not systematic. The chisquare result is with probability higher than 0.05 supporting our initial hypothesis that the individual-level effects are adequately modeled by a random-effects model. Therefore, the estimation result has been done through the random effect model.

6.2.7.2. Rules for Testing the Hypotheses

Market Power Hypothesis - if either of the market power hypotheses holds true, then the expected signs of the coefficients for structural measures should be positive and greater than zero, that is $Conc > 0$ or $MS > 0$. The main research question of the study is

to explore whether market power which results from high market concentration and relative market share or efficiency is important in determining overall performance of the banking sector. As shown in the table below, the market concentration measure (HHI) has established a negative and significant relationship with both profitability measures (Table 6.6). Nevertheless, it's not significantly related with the price variable (NIM). The estimated coefficients for market power and concentration variables in all models are consistent to reveal a negative association with both price and profitability variables.

Table 6.6: Regression Results

	Model 1 RoA	Model 2 RoE	Model 3 NIM
LAG	.587719 (0.0089)*	0.4105 (0.0138)*	.65423* (0.0230)
HHILN	-.0002875 (0.0000)*	-.0031657 (0.0000)*	.0001346 (0.1990)
MSLN	-.0090811 (0.0000)*	-.0492583 (0.0047)*	-.0026079 (0.0817)
XEFF	1.337642 (0.128)	-1.367384 (0.0898)	.663684 (0.0056)*
SEFF	0.364892 (0.0198)*	0.98291 (0.0015)*	-.619851 (0.0012)*
OWN	-.5186258 (0.0570)	.29665 (0.0514)	0.640881 (0.0450)*
LNDP	.0032849 (0.0780)	.1365837 (0.0138)*	.0225556 (0.1954)
CONS	1.930947 (0.0316)*	8.867438 (0.0228)*	5.818448 (0.0000)*
Adjusted R2	42.32%	38.25%	33.45%
Walid Chi2	51.16 (0.0000)*	46.87 (0.0000)*	28.18 (0.000)*
F-test	8.2 (0.0000)*	6.8 (0.0000)*	5.2 (0.0000)*
LM test	9.6 (0.0000)*	4.3 (0.0000)*	7.6 (0.0000)*
Hausman Chi2	216.0 (0.0645)	138.24 (0.5674)	108.32 (0.2055)

* significant at 5% level of significance

Source: Author's Computation (STATA 12)

The result rejects both hypotheses (SCP and RMP) and supports the conclusion that neither collusive power from large banks nor high market power of individual banks has a significant influence on performance of the Ethiopian banking industry. This study rejects the traditional structure-conduct-performance hypothesis which claims that competitive conditions that result from industry structure influence the behavior of companies and in turn dictate the performance of the industry (Smit and Trigeorgis, 2004).

The study result, however, shows that the current performance of banks is not significantly influenced by market power and collusive power of large banks. Even performance measures tend to move in opposite direction with the existing market structure and market share distribution. Market abuses resulting from collusive behavior appear insignificant to affect the prices paid to resources as well as the interest earned from loans. This remains to be one of a surprising result in a market structure like the Ethiopian banking system (tight oligopoly²) where few large banks were predominantly taking the lead in major market areas. Such scenario theoretically supported to result in high concentration due to the less cost of collusion for existing firms. Nevertheless, this has not been supported in both price and profit models where the higher concentration in the market has not lead to higher prices and greater than normal profit . Hence, acting on the concentration variable will not be a driver to improve bank performances. This has been one of the critical findings brought to the interview session with bank managers and regulator staff in an attempt to look for good justifications as shown in the next chapter. The negative and significant association, however, portrays that bank performances could be further improved through correcting the market structure towards diversification.

² Salvalore (1998) identifies four different types of market organizations i.e. Perfect competition at one extreme, (b) Monopoly at the opposite extreme, (c) Monopolistic competition and (d) Oligopoly in between. In addition, Shepherd included the concept of the dominant firm as a firm having 50-100% of the market and no close rival. He further classified oligopoly in two to as tight oligopoly (The leading four firms combined 60-100% of the market) and loose oligopoly (The leading four firms have 40% or less of the market).

Efficiency structure hypotheses- if efficiency structure hypotheses hold true, then expected signs of the coefficients for efficiency measures are greater than zero and positive. The signs of coefficient for structural measures are zero, that is: $XEFF > 0$, $SEFF > 0$, $Conc = 0$ and $MS = 0$ because more efficient banks are more profitable.

The first regression applied on profitability measures provided statistically significant evidence that the main cause of better performance is the scale efficiency of banks. The empirical findings show that scale of operation remained a pre-condition for banks to have superior performances. In other words, banks operating at suitable return scale have been driving better efficiency which is translated to high profit performances. This is in support of the scale efficiency version of the efficient hypotheses which claims that firms in optimum scale produce goods and services at relatively lower cost. The cost advantage; therefore, result in better profitability performances. Nevertheless, the regression on NIM model pointed out a statistically significant negative relationship between scale efficiency and NIM indicating that scale efficient banks charge lower net interest margin than less scale efficient banks. These results predict that banks with high scale efficiency are capable of earning higher profit lowering their interest rates on their earning assets and/or paying high interest rates on mobilized resources. Surprisingly, this is in line with the practice as observed from the result of the qualitative study where big banks were found to charge a relatively lower interest rate during credit extension. On the other front, managerial efficiency variables have shown mixed relationship with the applied profit performance measures but remain insignificant in all models. For instance, the managerial efficiency established a statistically insignificant positive relation with RoA but it has a statistically negative and insignificant relation with RoE. The insignificant relationship rejects the managerial efficiency version of ESH. However, an interesting prediction is that banks can augment their profit records from their asset by increasing their managerial capabilities. This however is not much observed on the RoE, whose denominator mostly fall under the discretion of regulatory environment. In contrast, the managerial efficiency has maintained a positive and significant relationship with NIM supporting the managerial efficiency version of ESH. Therefore, managerial efficient banks can gain higher NIM through in placing better management on their earning assets and interest bearing liabilities. This is in line with

the expected vital involvement from management in some critical operations that have a bearing on net interest margin such as maintaining strong asset quality and controlling cost of fund through establishing reliable deposit mixes. Therefore, creating a favorable credit management and resource mix framework appear to be a strong determinant to ensure a higher NIM than embedding price related measures to boost intermediation margins.

6.2.8. Competition/Contestability of the Banking Sector

The coefficient of the lagged variable for both RoA and RoE is between 0 and 1 suggesting for the persistence of profit. The lagged measure coefficient, however, is at the middle of 0 and 1 witnessing the modest competitiveness of the sector. The coefficient of the lagged profitability RoA_{t-1} and RoE_{t-1}, is the speed of adjustment to equilibrium profits (Athanasoglou et. al., 2005). Therefore, a value of this coefficient between 0 and 1 suggests that profits persist, but eventually returns to the natural level. A value close to 0 suggests that the speed of adjustment is very high meaning that the banking industry is highly competitive, and when the value is close to 1, the speed of adjustment is very low suggesting an industry with a low competitive structure. The traditional structure performance hypothesis assumes that the degree of market concentration is inversely related to the degree of competition (Edwards et al., 2006). Similarly, the study result finds a negative statistical relationship of market structure with performances which signifies that competitiveness of the sector could be improved through altering the existing structure of the banking system

6.2.9. Impact of Controllable Variables (Risk and Ownership) on Performances

The coefficients of control variables seem to be mixed with the results of the regressions (Table 6.6). The regression results on the RoA model pointed out that state-owned bank have earned relatively lower profitability as compared to their asset holdings. Nevertheless, the RoE model predicts that state owned banks performed well in the usage of their equity as compared to the private owned banks. It implies that

state owned banks are operating with relatively lower capital level enjoying the discretion to decide on the pertinent capital level. This is unlike the situation at private banks whose capital holding decisions is attached to regulatory interest. In both models, however, the relationship is statistically insignificant. On the other front, the state owned banks have lower interest margin than private-owned banks. It implies that state-owned banks are in a better position of managing their interest expenses. The relationship is statistically significant and remained to be one of a unexpected result inviting opinion during the interview session. However, the result could not be a surprise if one takes into account the high share of demand deposits bearing closer to zero interest expenses. This has been also suggested in the interview and the favorable deposit mix of state owned banks is mainly a result of the implicit relationship of state owned banks have with public enterprises.

Both profit related regressions have exhibited positive sign for the estimated coefficient for variable represented risk, LTDP. The regression results confirmed the positive relationship between risk and the bank's profitability indicating that a heated intermediation forces banks to earn superior profit. This seems justifiable considering that fact that build-up of the lending portfolio has a double edge advantage of earning high interest income on one side and minimizing the opportunity cost of holding excessive liquid assets through lowering idle and non earning funds on the other. Therefore, positive relationship between profitability and risk can be expected. The results provided statistically insignificant evidence to support the above relationship in case of the RoA model and remained significant in the RoE. The NIM model; however, has a statistically negative association with risk. Despite, the contribution of a high LTDP to boost earning and minimize opportunity costs as said herein above, a heated intermediation could cause a problem in the intermediation yield. This is because a high risk scenario will place pressure on asset quality and deposit prices/mixes that have a downward effect on the NIM unless they are managed and controlled well. The relationship however is not statistically significant due to the lower level of asset quality problems in the Ethiopian banking industry.

6.2.10. Testing the Quiet Life hypotheses

After witnessing the existence of market power whose effect on performance...To support the market power hypotheses, additional relationships are tested:

$$\text{XEFFit} = f(\text{CONt}, \text{MSit}, \text{SEFF}, \text{Ze}) + \text{eit} \quad (4)$$

$$\text{SEFFit} = f(\text{CONt}, \text{MSit}, \text{XEFF}, \text{ze}) + \text{eit} \quad (5)$$

These conditions as testing are called the 'quiet life' hypothesis. This hypothesis predicts a reverse causation, that is, as firms enjoy greater market power and concentration, inefficiency follows not because of non-competitive pricing but more so because of a relaxed environment that produces no incentives to minimize costs (Hicks 1973). In this case, the signs on the coefficients on CONC and/or MS should be significantly negative. Thus, banks with greater market power are less efficient due to relaxed environment and slack management.

As explained above, the first condition of test for the relationship between market power and performance failed to support the SCP Hypotheses. Therefore, the finding from the test of the quiet life will now have a sole purpose of exploring the link between market power and efficiencies. The test for the quiet life hypothesis similarly mainly has rejected the existence of a quiet life scenario in the Ethiopian banking industry in most of the scenarios; however it has ensured a mixed result in the market share measures. . The coefficients of the market concentration measures in both markets remained positive and statistically significant in all models. This suggests that the high industry concentration has positively impacted the scale and managerial efficiency of banks. The banks operating in highly concentrated markets therefore remained cognizant on their efficiency through controlling their scale of operations and improving their managerial efficiencies. On the other front, the market share variables has resulted in a mixed output where it has positively associated with scale efficiency but remained negatively associated with the managerial efficiency measures (Table 6.7). Banks enjoying a high market share consider the scale of operation as an important determinant of their performances but their management engages in a quiet life behavior. Nevertheless, the lack of a significant positive association between market share variable with

performances constrains to generalize on the reluctance of managers of banks with high market share on cost control.

Table 6. 7: Regression Result

	Model 1	Model 2	Model 3	Model 4
	XEFF	SEFF	MSLN	CONC
HHILN	.6250 (0.0156)*	.01440 (0.0010)*	-1.62020 (0.0998)	
MSLN	-.0018717 (0.0845)	.012961 (0.0650)		1.03888 (0.0988)
XEFF		.7456281 (0.0000)*	0.41926 (0.000)*	-.11132 (0.0845)
SEFF	.7281218 (0.0000)*	-.0233486 (0.37520)	0.347953 (0.0000)*	0.31982 (0.0285)*
OWN	.0731552 (0.0142)*	-.0233486 (0.37520)	-1.029979 (0.0966)	-.1191492 (0.0956)
LNDP	-.0015542 (0.0380)	.018833 (0.0130)*	-.2786637 (0.0030)	-.30786 (0.0060)*
CONS	.2303744 (0.0000)*	.1933794 (0.0000)*	18.45111 (0.0090)*	23.22482 (0.0100)*
Adjusted R2	58.96%	60.02%	32.5%	28.33%
Walid Chi2	267.15 (0.0000)*	260.66 (0.0000)*	26.8 (0.000)*	29.25 (0.0000)*
F-test	2.4 (0.0000)*	4.5 (0.0000)*	6.2 (0.000)*	5.9 (0.0000)*
LM test	7.2 (0.0000)*	6.3 (0.0000)*	8.4 (0.000)*	9.2 (0.0000)*
Hausman Chi2	89.1 (0.0000)*	5.2 (0.0720)	3.4 (0.1811)	7.4 (0.8524)

Source: Author's Computation (STATA 12)

In sum, in several points, the findings on the test of quiet life remains consistent with the analysis on efficiency at the next section where big banks were on the frontier and taking the lead in both scale and managerial efficiency indicators. Nevertheless, the unique relationship observed between market share and efficiency has been forwarded to the interview session for further justifications from bank managers and regulator staff.

6.2.11. Testing the Effect of Market Structure on Efficiency

A necessary condition for the efficiency structure hypotheses to hold is that efficiency affects market structure. To fulfill the necessary condition, following two equations are also tested:

$$\text{ii. } MS_{it} = f(\text{CON}_{it}, \text{SEFF}_{it}, \text{XEFF}_{it}, Z_{it}) + e_{it}$$

$$\text{iii. } \text{CON}_{it} = f(\text{MS}_{it}, \text{SEFF}_{it}, \text{XEFF}_{it}, Z_{it}) + e_{it}$$

In both equations, the signs of coefficients for efficiency measures should be positive because more efficient firms will have larger market shares.

The testing on the two supplementary regressions has supported the scale efficient version of the ESH hypothesis. The scale efficiency has established a statistically significant and positive relationship with both market power and concentration measures. Therefore, the regressions have provided the conditional support for the existence of efficient hypotheses in the Ethiopian banking market. As explained in the ESH version of market structure hypotheses say that efficiency influences market share of the firm and concentration. Therefore, efficiency rather than market power is found to be a driver of performance and an essential element to build up market power.

6.2.12. Robustness Test (Specification Tests after the Result)

6.2.12.1. Normality and Linearity

The normality test using skewness and kurtosis tests shows that the variables used in the model are normally distributed (Table 6.8).

Table 6.8: Normality of the Variables

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Adjchi2(2)	Prob>chi2
RoE	193	0.0000	0.0000	63.45	0.0000
RoA	193	0.0000	0.0000	66.7	0.0000
NIM	193	0.0000	0.0000	72.34	0.0000
HHILN	193	0.0000	0.0000	73.5	0.0000
XEFF	193	0.0000	0.0000	68.52	0.0000
SEFF	193	0.000	0.0003	56.25	0.0000
MSLN	193	0.0000	0.0000	78.25	0.0000

OWN	193	0.0000	0.0006	68.45	0.0000
LNDP	193	0.0000	0.0005	58.62	0.0000

Author's Computation (STATA)

6.2.12.2. Multicollinearity Diagnosis

The test applied for multicollinearity is the Variation Inflation Factor (VIF) where $VIF = 1/\text{tolerance}$ and $\text{tolerance} = 1 - R^2$, $R^2 =$ coefficient of determination. The results from the VIF table suggest that VIF is not greater than 10 for any of the explanatory variables. Hence, irrespective of the significance level of multicollinearity, it appears to be not serious and can be ignored.

Table 6.9: Multicollinearity Test

Variable	Obs	VIF	1/VIF
HHILN	193	2.28	0.437993
XEFF	193	2.13	0.469558
SEFF	193	2.34	0.427542
MSLN	193	2.17	0.461883
OWN	193	3.20	0.312925
LNDP	193	5.19	0.192807
Mean VIF		2.88	

Author's Computation (STATA)

6.2.12.3. Heteroskedasticity

The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity is applied to verify the existence of heteroskedasticity. The test shows that at 5% level of significance, the p-value is higher showing that heteroskedasticity is not significant in the model. The small value of chi-square also supports the constant variance of the error term.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of Indp

chi2(1) = 2.11

Prob > chi2 = 0.0878

6.2.12.4. Autocorrelation

To test for the existence of autocorrelation the Durbin Watson test is used. The test statistic can vary between 0 and 4 with a value of 2 indicating that the residuals are uncorrelated. A value greater than 2 indicates a negative correlation and a value less than 2 depict a positive correlation. The result has shown that the D-statistic appear closer but exceeds 2 depicting negative correlation. As suggested by Field (2009), values less than 1 or greater than 3 are a cause of concern. Hence from Field's rule of thumb it can be inferred that autocorrelation is not serious.

Durbin-Watson d-statistic (9, 23) = 2.987678

6.3. Summary

The quantitative test on the relationship between industry concentration and performance has rejected the structure-conduct-performance (SCP) relationship. The statistical test has explored a negative and significant relationship in the profit models which is unlike the premise of the SCP that claims for a positive and significant effect of industry concentration on performances. In addition, the competitiveness level in the Ethiopian banking system appear to be unlike the one suggested in the SCP framework which posits for a limited competition in a market system characterized by high concentration. Most importantly the study found that scale efficiency of banks remained a strong determinant of performances. The result along with the rejection of a quiet life scenario in the Ethiopian banking industry confirms that efficiency appears to be a relevant determinant of bank performance. This supports the scale efficiency version of the efficiency hypothesis. The aforesaid outputs of the study are unexpected in consideration of the high concentration revealed in the Ethiopian banking market. Such unexpected results and the justifications thereof are examined in detail in the qualitative study of this thesis.

6.4. Testing the Efficiency Variation and its Determinants

This section of the study applies the Data Envelopment Analysis (DEA) whose reason of selection and the approach to be used explained in the previous section. The DEA input is used for two purposes in this study. First, the efficiency score derived from the model are used to test the efficiency variation among banks. Secondly, the efficiency scores representing scale and managerial efficiencies are used in the test of the impact of industry concentration on performances it has already done in the previous section of the study. Therefore, the efficiency assessment in this section of the study mainly meets the former purpose with the additions of a statistical test to examine those factors having a significant statistical relationship with the efficiency scores. By doing this, the study provides a response to one of the key research questions: Is there efficiency variation among banks operating in the Ethiopian banking industry. In addition to such responses, the study introduces the use of DEA in measuring efficiencies using multi-input and multi-output firms like banks.

6.4.1. Definition of Inputs and outputs using Descriptive Statistics

The DEA model applies the intermediation approach which relies mainly on the intermediation role of banks but with a consideration of banks activities in non-interest income sources. The description of inputs and outputs is shown below and the rationale of choosing them is described in the following part using descriptive statistics of the variables.

Table 6.10: Inputs and Outputs and their Corresponding Prices

Inputs	Prices	Price/input
Deposit	Interest expenses	Cost of fund
Branch	Staff expenses and rent	Branch running costs
Fixed assets	Depreciation, amortization	Fixed asset depletion rate
Outputs	Prices	Price/output
Loans and advances	Interest income	Effective interest rate
Other Earning assets	Non-interest income	Earning rate of non-interest income sources

Source: Author's computation

Descriptive statistics on the input side shows that the average industry deposit stood at Birr 8,809.8 billion which is far lower as compared to the maximum deposit raised by the giant bank, the Commercial Bank of Ethiopia, Birr 241,732 billion (Table 11). The distribution witnessed that there is a concentrated distribution in terms of resource mobilization towards the state owned banks. This can be easily observed if one considers the dominance in the market share of deposit by the big commercial bank. Literally, the entry of private banks seems to have marginal effect on reducing the market share of the state bank. In terms of market share, therefore, the commercial bank of Ethiopia and the two state banks together account 65% and 68% of the industry's deposit market share, respectively. The remaining 32% share is divided up among private banks which are significant in number as compared to the state owned banks. Of the private banks' market share, the recent entrant banks have a slight share of the market and dominance from middle level private banks remained the norm.

On the other front, the average branch size per bank is 75 over the 17 years period under consideration. Therefore, on average a bank in Ethiopia is operating opening 75 branches which is indicative of the dominance of a brick and mortar approach where proximity through physical presence remained the banking mode preferred by the Ethiopian banks. There is however an instance where a bank has opted to operate with a single branch model supported by multichannel banking system. Nevertheless, such approach seems doesn't get acceptance from the regulatory side in consideration of the policy framework to ensure financial inclusion through increasing bank branches. Therefore, banks are required to increase their branch size by 25% per annum so that they can support the government stance towards creating access to finance to the poor through establishing bank premises all over the country. Therefore, incorporating branch size as an input remains relevant to this study taking in to account that banks are investing and are expected to invest a big sum of their capital to establish a large network of branches. This is done not only due to the banks' choice of branch as a growth driver but a strategy need to be pursued to fulfill regulatory requirement. In addition, the choice of branch opening is subjected to approval from the regulatory side and is not under the discretion of the Banks. In addition to the dominance of a large

branch network, banks are also investing a lot in the acquisition of both tangible and intangible fixed assets. Investments on premises, vehicles and Information technology takes the major share of the Banks investment in fixed assets. On average, a bank invested Birr 135 million in fixed asset acquisition which remained large in consideration of a Birr 75 million entry capital during the past which is now grown to Birr 500 million and expected to reach Birr 2 billion under the Growth and Transformation Plan II (GTP II) of the country (Table 6.11). Therefore, with the growth in capital entry to the sector will remain restricted and the existing banks will be directed towards investing their capital on asset acquisition like owning head office and branch buildings, automations and introduction of e-banking products. Hence, the management of such investment which will have a direct impact on efficiency through affecting associated costs like depreciation and amortization expenses, IT license fees and fixed asset management. It's therefore essential to observe the effect of banks decision on fixed asset acquisition on their efficiency through incorporating fixed asset investment on the input side.

Table 6.11: Descriptive Statistics of Inputs and Outputs

Variable	Obs	Mean	Std. Dev.	Min	Max
Deposit	193	8809.762	26974.54	37	241732
Branch	193	75.74093	129.6661	1	977
Fixed asset	193	135.5803	241.6888	3	1740
Loans	193	4568.306	12516.1	37	111435
Earning Asset	193	4661.383	17914.83	6	158730
Interest expense	193	177.4974	479.6913	0	4749
Staff expense	193	112.5285	305.858	1	3038
General expense	193	103.715	227.3732	2	2339
Interest income	193	527.0326	1646.089	1	15269.3
Noninterest income	193	324.9171	816.9076	0	6837

Author's Computation (STATA 12)

On the output side, the banking system main channel of earnings are related to intermediation and fee income collected through exposure from earning assets mainly of earning from foreign transactions. On the intermediation front, banks credit activities takes the lead with an average loan to deposit exposure of 56% which proves that the

Ethiopian banks are highly reliant on the intermediation business for their earnings (Table 6.11). The concentration observed in the deposit market is also similar but at a reduced level is witnessed in the credit business. The market share of the CBE reach 60% of the total credit extension and the reimagining share belongs to the private banks. The average outstanding loan, Birr 4 billion of the system, is also far less than the credit exposure of the big bank, Birr 111 billion which is a further indication of the dominance of the state bank in this market.

The other component of output earning from other assets mainly composed of bank's foreign currency deposit in foreign correspondent banks remained a determinant factor for fee income collection through financing import activities. In addition, the earning asset constitutes a policy measure from the regulator for banks to purchase a certain portion of their deposit to purchase the government bills. This is attached with loan disbursement where banks are expected to spend around 27% new loan disbursement in the form of bill. This is attached with a 3% interest rate which is lower from the 5% minimum deposit rate required to be paid for saving and fixed time deposit holders. One of the important policy discriminations is that the exclusion of the big state owned bank from such obligation despite the expectation for all private banks to comply with the prerequisite. Such policy requirement obviously will have impact on efficiency of banks through placing a certain portion of their resources on low earning investments. In terms of amount, the earning assets eluding loans on average is Birr 4.6 billion which is almost equivalent of the level of the lending business. Therefore, despite the large share of the intermediation, business banks seem to engage in fee income activities to boost their earning level. Considering such output, therefore, will have crucial importance as the intermediation business in consideration of the significant share in the balance sheet and its high contribution to earnings in the form of non-interest income.

The input price which has a direct association with the selected inputs is also one of the determinant factors of efficiency in banking operation. For instance, bank's liquidity mainly built through collecting local and foreign resources in the form of customer

deposits shows that banks on average are paying more than Birr 170 million per annum over the last 17 years for the resources mobilized. This will create an effective cost fund of 3%, which seems lower than the 5% minimum deposit rate to be paid for saving and fixed time deposit mainly due to the relatively good share of low cost deposit types like demand deposits. The staff expenses and general expenses which are applied as a running cost for branches and some head office businesses like bank promotion, fixed asset management and others also take a significant portion of banks expenses. The average amount of expenses on staff salary and general expenses are almost equivalent to the price paid to deposits. Therefore, management's capacity to control the level of expenses will be one of the determinant factors besides banks' capacity to build their liquidity through creating a reliable and cost effective deposit mixes.

Building the earning base of banks through extending quality loans and reducing the level of inefficiency arising from non-performing assets is also another determinant factor of bank efficiency. The average interest income of the banking group over the 17 years is Birr 527 million per annum, with a denominator of an average of Birr 4 billion loans. This yields an effective interest rate from loans of 12%. Attached with 3% cost of fund, the banking industry remained enjoying a wider spread of 9%. The income from fees and commissions which is mainly derived from the non-intermediation business has a bit wider gap as compared to the income obtained from intermediation business. Therefore, considering the restrictive policies on the lending side, it seems there is still a room towards boosting the share of the non-intermediation businesses. The average non-interest income of the banking sector over the last 17 years is Birr 324 million per annum which is less as compared to Birr 527 million income from loan interest income.

6.4.2. The DEA Efficiency Scores Results

The average cost efficiency of the Ethiopian banks under the constant return scale approach is 84% which is indicative of the fact that some of the banks in the group could have earned more through using the same level of inputs. Or else, the output level they have generated so far could have been produced through a reduced level of

input usage. The other scenario that could be observed is that there is a wider variation among banks in terms of their efficiency level. For instance, the minimum cost efficiency level of some banks is reduced to 27% which is mostly related to new entrant banks as it takes time for their investments in fixed assets and branch usage to produce the expected results. Therefore, with the exclusion of the freshness effect, the minimum efficiency score will grow to 68% (Table 6.12). This will show a better picture than what has been reported but will not change the fact that there is a divergence in efficiency level across banks. A rather improved picture has been revealed on the variable return scales approach where banks average efficiency level has grown to 92%. Nevertheless, the variation factor which is not affected by entry time is still prevalent with a deviation from the minimum and maximum efficiency score stood at 36%. Therefore, despite the good average record of efficiency noted on aggregate, the variation observed points that there are banks in the sector that need to bring their efficiency level at the industry level. The scale effect, which is a quotient from the constant and variable return scale, signal an improved efficiency status than the efficiency level under constant return scale but with an indicative point on remaining tasks towards more improvement.

Table 6.12: Descriptive Statistics of Efficiency Scores

Variable	Obs	Mean	Std. Dev.	Min	Max
Cost Efficiency (CRS)	193	.8420893	.1255129	.271874	1
Cost Efficiency(VRS)	193	.9236762	.0930616	.6415	1
Scale Cost Efficiency	193	.9142754	.1138639	.271874	1
Profit Efficiency(CRS)	193	.8317337	.2072173	.21752	1
Profit Efficiency(VRS)	193	.8987414	.1686922	.31642	1
Scale Profit Efficiency	193	.9253778	.1407859	.21752	1
Revenue Efficiency(CRS)	193	.868658	.1254732	.508995	1
Revenue Efficiency(VRS)	193	.9144616	.1070092	.616366	1
Scale Revenue Efficiency	193	.9508949	.0847197	.508995	1

Source: Author's Computation

A rather improvement is portrayed if one considers the revenue efficiency level of Ethiopian banks. The revenue side performances under constant return scale marginally step up to reach 87%. Therefore, despite the notable effect of a variation on

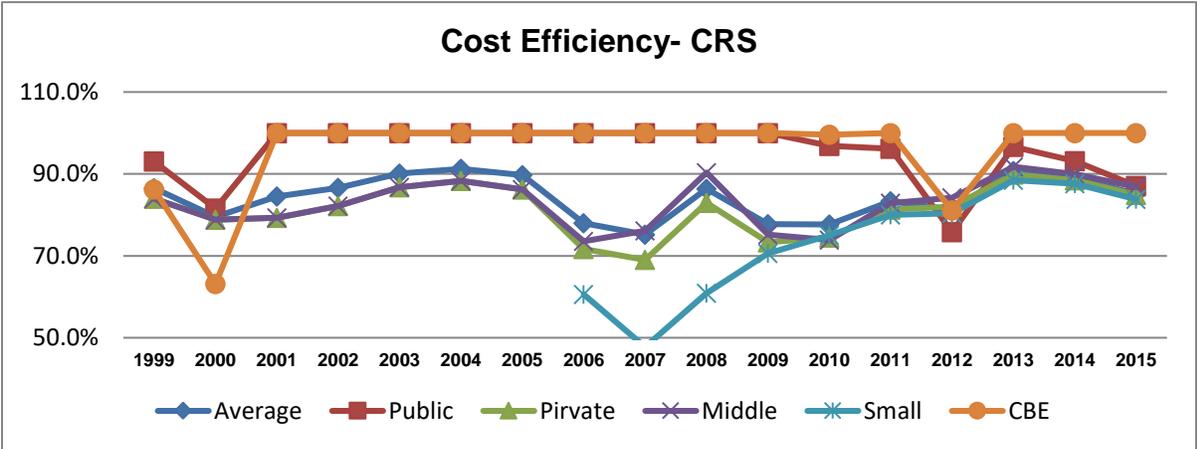
cost control, the revenue generating capacity of banks was on high front (Table 6.12). This is as a result of the wide spread banks were enjoying from their intermediation activities along with the relatively high commission rate on forex business taking advantage of the scarce availability of such resources in the industry. Banks take the upper hand on channeling and deciding the amount of pricing of such resources. This has resulted in a relaxed cost control affecting the level of profit efficiency to some extent. A further look at on the profit efficiency level shows a rather reduced performance where the average efficiency score for banks stood a bit lower than the cost and efficiency levels. Therefore, the effect arising from a relaxed cost control seems outweighing the positive effect derived from high margins ultimately impacting the level of the profit efficiency to the negative. Such assessment could be further clarified considering trend factors and individual bank performance as shown in the next section.

6.4.3. Cost Efficiency and Trends under CRS and VRS Models

This section of the study investigates whether there has been an improvement and convergence of cost efficiency in the Ethiopian banking markets since the introduction of the private banking system. This is done applying efficiency measures derived from DEA estimation. The overall DEA results show relatively low average efficiency levels, 84% with an efficiency level ranging from 75% to 91%. Nevertheless, trend wise, it is possible to distinguish a slight advance in the average efficiency scores over the period of analysis for almost all banks in the sample (Figure 6.3). However, the results show that the efficiency gap among banks relatively grew even wider over the period 1997-2015. A more diverging trend has been noted when one considers the gap in efficiency among the state owned bank and private banks. Surprisingly and unlike the expectation on a reduced efficiency from state owned banks, the performance of the big bank has been consistently on the top of the frontier. The expectation of a reduced state ownership is due to their high involvement in some political decisions like financing of government priority sectors like agriculture, export, industry etc. and a demand from the government to serve the under developed banking market through operating a wider

branch network. Nevertheless, the results appear unique and state ownership established a secular relationship with efficiency. The reduced trend in efficiency score of state banks in aggregate is a result of the poor performance from the Construction and Business Bank which recently decided to be merged with the big state owned bank. Therefore, the introduction of a private banking system doesn't alter or even has improved the efficiency performance of the state owned bank unlike the expectation for its reduction due to a gradual take over in market share from private banks. Another important finding is that the efficiency score of private banks is characterized by a fluctuation trend with an improvement in recent period but a down drop curve during 2015. The entry of new private banks seems affecting mostly of the existing private banks than the giant state bank. Therefore, if one expects any sign of competition due to entry of banks in the market that will be a competition arising from private banks themselves rather than among state and private owned banks.

Figure 6.3: Cost Efficiency of Ethiopian banks from 1999-2015



Source: Author's Computation

Additional observation on efficiency of banks after entry of small banks after year 2006 shows that the small banks relatively took a long period to adjust and approach the efficiency level of already operating banks. Currently however a good level of efficiency gain is arising from the small private banks whose efficiency trend is coming closer to the middle level private banks but the score still remains lower as compared to the big state owned bank and the middle level private banks. Individual basis analysis shows

that there are some private banks under the middle income group which are periodically losing their efficiency level unlike a good performance from small banks which managed to bring their efficiency score towards the frontier. Therefore, the x-inefficiency from the middle bank group is on the rising trend with a high variation observed across banks. This is because the high growth rate in private banks seems challenged to attract better management of inputs costs which should remain a cause of concern attracting the attention of the banks management and the regulatory policy interventions. In terms of number of efficient Decision making Units (DMUs), despite the growth in the number of banks over the years, the number of efficient DMUs remained constant with average number of efficient DMUs not exceeding two. Therefore, the effort to bring the banks in the frontier remains a duty waiting the participation of most banks in the industry. In terms of the efficiency gap, the gap between the efficiency score of private banks and the CBE is on average 15 percentage points with a maximum difference of 31 percentage points in year 2007 which is substantial and remained strongly divergent (annex 3).

6.4.4. Cost Efficiency –Variable Returns to Scale

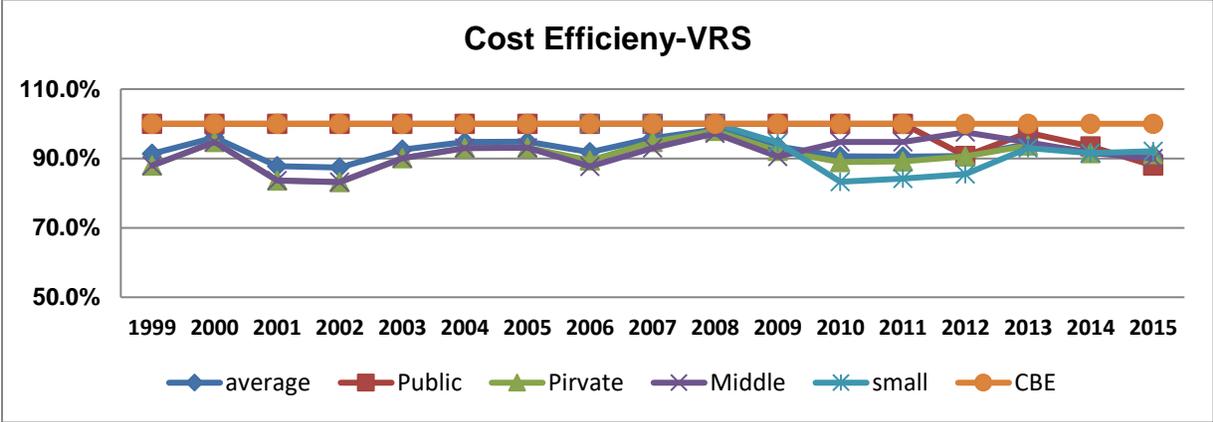
The estimation result from the VRS model depicts a more plausible performance in the number of efficient banks and the average efficiency for the sector as compared to the result from the CRS model, implying that the main source of inefficiency is due to scale inefficiencies. The average efficiency score under the VRS model shows an eight percentage point improvement to reach to 92%. Even with such level, there is a still a room for an efficiency improvement through improving the input usage and control of their associated costs. In terms of efficient DMUs the picture shows improvement of the 18 banks 5 of them pick up towards the frontier which is double from the efficient DMUs record of the CRS output. Nevertheless, the proportion of efficient DMUs decreased over time and the average efficiency shows a variation with a decrease in trend during the recent periods although the drop is less substantial than in the CRS case. The standard deviation shows a similar pattern and state owned banks appear to be more efficient than private banks in terms of average efficiency scores dominating the frontier.

Surprisingly, the CBE score under all the periods considered is on the frontier resulting in similar unexpected result from the theoretical expectation of a low efficient score. Unlike the CRS model under the variable scale, the small private banks registered a high efficiency score exceeding the level observed on middle size private banks score. Therefore, the result shows that most of the small banks are operating under an increasing return scale and the effect of size diminishes overtime unless exceptionally large difference in size is observed across banking groups. The efficiency score output by size, therefore, shows that the source of x-inefficiencies are mostly felt on middle size banks which are expected to improve their management capacity in line with the growth of their businesses. The deviation among banks also remained wide but portrayed a narrow picture as compared to the CRS model. One of the worrying issues revealed in both models is the recent period performance in efficiency for private banks is on the downward trend despite a strong picture for the large state owned bank. This is in association with the restricted intermediation activity following a change in policy towards engaging the private banks on purchase of bills. This obviously impact the level of intermediation as well as the income obtained thereof through exposing part of the banks' asset on low earning placements. Similarly, the average state owned efficiency is on the downward trend due to the decrease in performance of the other state owned bank in the group. Nevertheless, the big state owned bank, which is exempted from bill purchase, remained on top of the efficiency score enjoying non-compliance to the lending restrictions.

In summary, it appears that during the recent period, there was no improvement in efficiency in the banking sector in Ethiopia and no convergence in the sector is apparent. State owned banks consistently record higher efficiency scores and the gap between state and private banks seems large and with modest increase. The result suggests that the largest state owned bank is more efficient than the private banks. However, the performance of the small ones is improving to exceed early entrant middle size private banks especially the differences are substantial in the VRS model. Thus, the main source of inefficiency is partly due to scale inefficiencies stemming from large banks but management inefficiencies could also be cited considering the a better

growing efficiency of small banks as compared to the efficiency growth of middle private banks.

Figure 6.4: Cost Efficiency of Ethiopian banks under VRS from 1999-2015



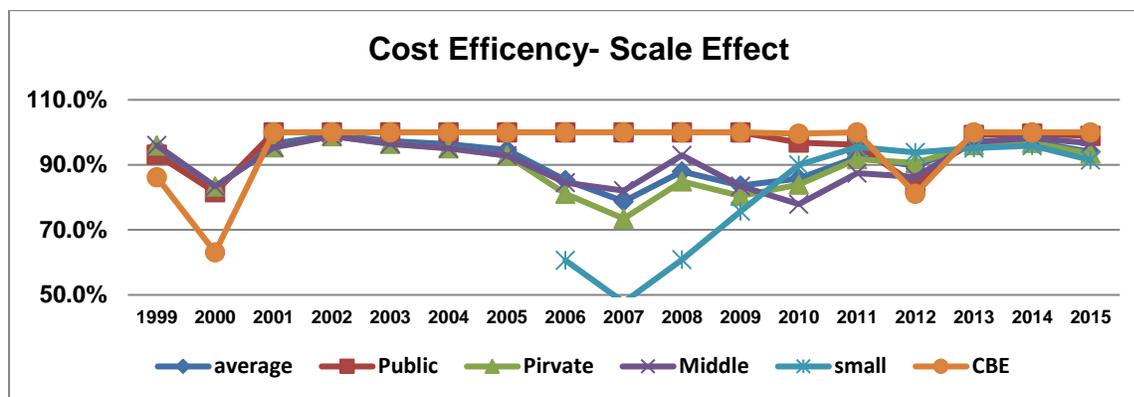
Source: Author's Computation

6.4.5. Scale Efficiency

The results for the pooled model in general confirmed the earlier findings that scale inefficiency is the dominant factor in influencing the efficiency of banks. The analysis based on VRS shows that small banks exhibited a higher mean pure cost efficiency of 92.4 percent compared to middle sized private banks (91.6 percent). This suggests that small banks are managerially efficient in controlling costs compared to their middle size counterparts and are operating under increasing returns to scale. However, due to the effect of the CRS output, the mean scale efficiency of small private banks remained lower than both private middle banks and state owned banks. The result for state owned banks remained the same with an average score on the frontier in most years of the period considered with the efficiency scale on the frontier for the CBE in all cases. It is interesting to note that the degree of cost efficiency under CRS for private banks is lower than the degree of scale efficiency which indicates that a portion of overall inefficiency is due to producing below the production frontier rather than producing on an inefficient scale. Nevertheless, most of the cost inefficiency exhibited by the banks stem from operating at the wrong scale; ether operating at a scale that was too large

(DRS) or operating at a scale that was too small (IRS). Since the major source of inefficiency in the Ethiopian commercial banking system is scale inefficiency, this study then examines further the trend in the returns to scale of Ethiopian commercial banks as shown in the following section.

Figure 6.5: Cost Efficiency of Ethiopian Banks 1999-2015 Scale Effect



Source: Author's Computation

6.4.6. Developments in Returns to Scale (RTS)

DEA provides information about scale efficiency as the ratio of the constant return scale efficiency score to the variable return scale efficiency score to identify whether the efficiency score of a given observation is not influenced by moving from a constant returns to scale operation to a variable returns to scale operation. As shown above, the results for the Ethiopian banking system indicates high levels of scale efficiency with notable variation from year to year. Nevertheless, with regard to the direction of scale inefficiency, it appears a common phenomenon among the private banking system to operate under too high scale (decreasing returns to scale) or too low scale (increasing returns to scale). In contrast, the share of scale efficient (constant return to scale) in private banks is small and remained less than 10% in the period considered. On aggregate basis, the results for the private banking system favor an increasing return to scale operating region. However, further breakdown of the data by size of private banks shows that the number of private banks experiencing economies of scale (IRS) mostly favors smaller than the middle size private banks. The middle level private banks were

experiencing diseconomies of scale (DRS) with a decline in the number of banks operating under increasing or constant return to scale. On the other front, the distribution of returns of scale suggests that the state banks are mostly operating under constant return scale. The experience in managing inputs and controlling associated costs seem strong in the stated owned banks on account of their long time stay in the industry. A historical trend skewed towards optimum scale operation along with an efficiency score consistently on the frontier shows that such banks are managing their costs and operations efficiently. On aggregate basis, the result for all years (pooled) suggest that the share of banks experiencing economies of scale, diseconomies of scale and scale efficient is 37%, 45% and 18%, respectively, all witnessing that scale problems are pronounced in the Ethiopian banking system (Table 6.13). In other words, the results suggest that the share of scale efficient banks (CRS) was small. Therefore, a majority of the small private banks seem to increase the scale of operation in order to achieve the optimal scale and vice-versa for the middle size private banks.

Table 6.13: Developments in Returns to Scale(RTS) in Ethiopian Commercial Banks

Year	Bank Group	IRS		DRS		Constant		TOTAL	
		NO	%	NO	%	NO	%	NO	%
1999	State	0	0.0%	1	50.0%	1	50.0%	2	100.0%
	Private-	4	80.0%	0	0.0%	1	20.0%	5	100.0%
	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2000	State	0	0.0%	1	50.0%	1	50.0%	2	100.0%
	Private-	1	16.7%	4	66.7%	1	16.7%	6	100.0%
	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2001	State	0	0.0%	0	0.0%	1	50.0%	1	50.0%
	Private-	5	71.4%	2	28.6%	0	0.0%	7	100.0%
	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2002	State	0	0.0%	0	0.0%	2	0.0%	2	0.0%
	Private-	3	50.0%	2	33.3%	1	16.7%	6	100.0%
	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2003	State	0	0.0%	0	0.0%	2	1.0%	2	1.0%
	Private-	3	50.0%	2	33.3%	1	16.7%	6	100.0%
	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2004	State	0	0.0%	0	0.0%	2	100.0%	2	100.0%
	Private-	2	33.3%	4	66.7%	0	0.0%	6	100.0%
	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2005	State	0	0.0%	0	0.0%	2	100.0%	2	100.0%
	Private-	1	16.7%	4	66.7%	1	16.7%	6	100.0%

	Small	0	0.0%	0	0.0%	0	0.0%	0	0.0%
2006	State	0	0.0%	0	0.0%	2	100.0%	2	100.0%
	Private-	0	0.0%	6	100.0%	0	0.0%	6	100.0%
	Small	1	100.0%	0	0.0%	0	0.0%	1	100.0%
2007	State	0	0.0%	0	0.0%	2	100.0%	2	100.0%
	Private-	0	0.0%	6	100.0%	0	0.0%	6	100.0%
	Small	2	100.0%	0	0.0%	0	0.0%	2	100.0%
2008	State	0	0.0%	0	0.0%	2	100.0%	2	100.0%
	Private-	0	0.0%	6	100.0%	0	0.0%	6	100.0%
	Small	2	100.0%	0	0.0%	0	0.0%	2	100.0%
2009	State	0	0.0%	0	0.0%	2	100.0%	2	100.0%
	Private-	0	0.0%	6	100.0%	0	0.0%	6	100.0%
	Small	4	100.0%	0	0.0%	0	0.0%	4	100.0%
2010	State	0	0.0%	2	100.0%	0	0.0%	2	100.0%
	Private-	0	0.0%	6	100.0%	0	0.0%	6	100.0%
	Small	1	16.7%	4	66.7%	1	16.7%	6	100.0%
2011	State	0	0.0%	1	50.0%	1	50.0%	2	100.0%
	Private-	1	16.7%	5	83.3%	0	0.0%	6	100.0%
	Small	2	25.0%	5	62.5%	1	12.5%	8	100.0%
2012	State	0	0.0%	2	100.0%	0	0.0%	2	100.0%
	Private-	0	0.0%	6	100.0%	0	0.0%	6	100.0%
	Small	0	0.0%	6	75.0%	2	25.0%	8	100.0%
2013	State	1	50.0%	0	0.0%	1	50.0%	2	100.0%
	Private-	3	50.0%	2	33.3%	1	16.7%	6	100.0%
	Small	8	100.0%	0	0.0%	0	0.0%	8	100.0%
2014	State	1	50.0%	0	0.0%	1	50.0%	2	100.0%
	Private-	3	50.0%	2	33.3%	1	16.7%	6	100.0%
	Small	10	100.0%	0	0.0%	0	0.0%	10	100.0%
2015	State	1	50.0%	0	0.0%	1	50.0%	2	100.0%
	Private-	4	66.7%	2	33.3%	0	0.0%	6	100.0%
	Small	9	90.0%	0	0.0%	1	10.0%	10	100.0%
1999-2015	State	3	9.1%	7	21.2%	23	69.7%	33	100.0%
	Private-	30	29.4%	65	63.7%	7	0.068627	102	100.0%
	Small	39	66.1%	15	25.4%	5	0.084746	59	100.0%

Source: Author's Computation

6.4.7. Revenue and Profit Efficiency

The output oriented approach is an alternative way of looking at the efficiency of banks. On the output side, the efficiency score revealed a mixed result in which the revenue side performances marginally step up to reach 87% this, however, is on reverse side if one considers the profit efficiency level performances (84%). Therefore, the efficiency gain observed in the revenue side is diluted by inefficiencies related to cost control resulting in a profit efficiency level closer to the cost efficiency level. The result is similar in both returns scale with an analogous distribution across state owned and private

banks. There was also similar profile as the cost efficiencies in terms of the number of efficient DMUs in which very limited banks were operating on the frontier under constant and variable scale. The state owned banks are still on the top list of the efficiency score with a steady trend of good record from the CBE. The profit efficiency record, in fact, has a record of increased number of efficient banks which has improved the aggregate profit efficiency level more specifically under the variable return scale (annex 4). Under the constant return scale, the middle size private banks were performing well as compared to small banks. Nevertheless, such scenario changes whenever a transition towards a variable return scale is made suggesting that the small private banks are mostly operating under the increasing return scale. Trend wise also, the private banks record is with a fluctuating trend with a recent performance on towards a decrease in efficiency level. This is following the pattern in the efficiency of middle size private banks, but the small banks efficiency trend is an upward with a relatively long period of adjustments towards the efficiency level of the private banking system. The efficiency gap of private banks with the most efficiency bank in the industry is wide with an average gap of 14 percentage points reflecting the limited efficiency gains from the private banking system and the dominance of the state bank in both input and output sides of efficiencies. However, the increase in the number of efficient banks under the profit efficiency side shows that the banking industry in Ethiopia is a profitable venture despite a disparity in management of costs. The cost management and input selection seems being paid a lower consideration due to banks choice for an easy way to ensure their profit records. That is banks seem to earn revenue from their activities not only through ensuring cost control and activity expansion but through charging prices on highly demanded products like credit and foreign exchanges. Such phenomenon provides an indication to suppose the existence of a quiet life hypothesis in Ethiopian banking system where banks are much unconcerned about ensuring their cost efficiencies as long as they can easily achieve a good record on the revenue stream through charging relatively high prices. The price setting mechanisms therefore take up the loss from cost inefficiencies and support banks to reveal a better performance record in the profitability and revenue front. This in fact will not be a surprise considering the Banks upper hand in the lending decisions and allocation of forex resources and

inconsideration of the high demand for both resources in the market. Therefore, banks choice to work on the revenue stream with little contemplation on cost control is much driven by their market power and hence discretion to set their output prices in a way to keep their spread and profit margin stable. On the other front, such observable fact is also indication of the limited competitiveness of the Ethiopian banking system which entertained collide banks agreed at least not to compete on price basis.

6.4.8. Parametric and Non-Parametric Tests

After examining both the efficiency scores and sources of inefficiencies, we investigate further whether each group of bank, private and state banks are drawn from the same population and whether these two groups possess the same management or technology capability. The hypothesis to be tested is framed as follows:

H0= state banks and private banks are drawn from the same environment or technology
H1=state banks and private banks are drawn from a different environment or technology.

Table 6.14: Test on Efficiency Variation across Banks

Banks	obs	rank sum	expected	Two-sample Kolmogorov-Smirnov test for equality of distribution functions
Two-sample Wilcoxon rank-sum (Mann-Whitney) test				. ksmirnov costefficiencyscorecrs, by(ownership) Smaller group D P-value Corrected ----- private: 0.6598 0.000 state: 0.0000 1.000 Combined K-S:0.6598 0.000 0.000
Private	159	13560	15423	
state	34	5161	3298	
Combined	193	18721	18721	
unadjusted variance 87397.00 adjustment for ties -566.77 adjusted variance 86830.23 Ho: costef~s(own=private) = costef~s(own=state) z = -6.322 Prob > z = 0.0000				

Analysis of Variance					
Source	SS	df	MS	F	Prob > F
Between groups	.508892907	1	.508892907	38.64	0.0000
Within groups	2.51577895	191	.013171618		
Total	3.02467185	192	.015753499		
Bartlett's test for equal variances: chi2(1) = 2.2073 Prob>chi2 = 0.0137					

Source: Author's Computation

Both parametric (analysis of variance and t-test) and non-parametric (Wilcoxon Rank-Sum and Kolmogorov –Smirnov) tests are used to test the null hypothesis that the two groups are drawn from the same population and have identical management /technologies. From the results, we reject the null hypothesis that the state and the private banks have similar management and technology capabilities. This suggests that banks observed have access to different management capabilities and more efficient technology. Therefore we can conclude that, it is appropriate to separate the samples because these two groups of banks, private and state banks, have different management/technologies causing a variation in their efficiencies. The efficiency scores from the analysis clearly indicate that, public banks appear more efficient with the highest efficient level as close to 1 in all the years by both the models. It is clearly shown that Ethiopian banking sector is still dominated by public banks which are possessing efficient technologies and management capabilities.

6.4.9. Benchmarking, Slack and Improvements

The table below illustrates the areas of improvements in year 2015 for banks (Table 6.15). The purpose of such assessment is intended to set example to banks on the use of the DEA output for benchmarking and improvements. In addition, the study explores whether the benchmarking result is coherent with the return to scale difference observed in the banking system. As shown in the table, some banks need a lot of adjustments to achieve efficiency. For instance, some banks need to decrease total deposits and/or else increase branch sizes. From the output side, increase in lending

and earning assets could also improve performances of banks (see annex for output benchmarking). The above analysis is consistent with the previous section findings related to return to scale. Some banks are affecting their return of scale due to excessive holding of liquid assets and engaging in more aggressive branch expansion. This is limiting the efficiency of banks by holding large some of unproductive resources and costing banks in terms of excessive branch running costs. On the output side also bank loans and earning assets are not expanded as compared to their resource holdings. This obviously affects their efficiency levels.

Table 6.15: CRS Model Slacks and Model Target for 2015

DMU	Score	Benchmark(Lambda)	Times as a benchmark for another DMU	Sum Lambda	Slack Movement (Deposit)	Projection (Deposit)	Slack Movement (Branch)	Projection (Branch)	Slack Movement (fixed _asset)	Projection (fixed _asset)
ABAY	0.827289	CBE(0.003911); CBO(0.285642)	0	0.289553	-573.862	3049.945	-44.9036	44.09643	-42.0301	63.10091
ADDIS	0.897566	CBE(0.001588); CBO(0.089158)	0	0.090746	-68.8627	1040.734	-17.8774	14.12257	-31.8654	20.3346
AIB	0.880487	CBE(0.021367); CBO(1.538378)	0	1.559745	-2020.83	16499.59	30.78651	237.7865	-566.052	340.3707
BIRHAN	0.79478	CBE(0.003005); CBO(0.234627)	0	0.237632	-612.669	2455.226	-40.9813	36.01873	-3.15581	51.47119
BOA	0.738583	CBE(0.016123); CBO(0.625727)	0	0.64185	-2610.41	8507.752	-33.0203	103.9797	-722.948	151.3762
BUNNA	0.868546	CBE(0.003097); CBO(0.315688)	0	0.318785	-426.427	3074.613	-34.4622	47.53783	-20.4004	67.60656
CBB	0.741777	CBE(0.009078); CBO(0.262548)	0	0.271626	-1283.04	4128.867	-76.1115	45.88845	-103.144	67.54023
CBE	1	CBE(1.000000)	16	1	-0	241732	-0	977	-0	1740
CBO	1	CBO(1.000000)	16	1	-0	7367.888	-0	141	-0	197.086
DB	0.826061	CBE(0.030239); CBO(1.242347)	0	1.272586	-3350.88	16463.23	40.71453	204.7145	-385.069	297.4652
DGB	0.534218	CBE(0.000812); CBO(0.037221)	0	0.038034	-348.749	470.5931	-15.9582	6.041807	-34.4188	8.749166
ENAT	0.853185	CBE(0.000505); CBO(0.164083)	0	0.164587	-234.296	1330.928	12.62869	23.62869	-8.92153	33.21647
LIB	0.895691	CBE(0.007084); CBO(0.310872)	0	0.317956	-454.184	4002.816	-37.2463	50.75372	8.182129	73.59413
NIB	0.961288	CBE(0.014841); CBO(0.798075)	0	0.812917	-306.346	9467.768	12.02864	127.0286	-122.114	183.1135
OIB	0.792048	CBE(0.004617); CBO(0.638452)	0	0.643069	-1470.22	5820.068	-57.4676	94.53237	-48.9438	133.8632
UB	0.88987	CBE(0.020297); CBO(0.700313)	0	0.72061	-1004.5	10066.27	-8.42567	118.5743	-185.662	173.3387
WB	0.912433	CBE(0.021861); CBO(0.553734)	0	0.575595	-506.605	9364.339	-19.5653	99.43468	-493.855	147.1713
ZB	0.913957	CBE(0.009175); CBO(0.172741)	0	0.181916	-332.523	3490.737	21.32086	33.32086	-18.6859	50.01008

Source: Author's Computation

6.4.10. Determinants of Efficiency

After looking at efficiency as an important determinant factor of performances, we have moved the quantitative analysis to explore which of the inputs and outputs variable are the determinant factors of efficiency. The description and variables are shown in the DEA analysis above. The statistical test shows that deposit growth rate, loan size and earning asset growth are positively and significantly related to efficiencies. Nevertheless, branch size and fixed asset growth rate are negatively and insignificantly related to efficiencies. The justifications for the established relationships have been brought to the interview session as shown in the qualitative study section.

Table 6.16: Empirical Results on Efficiency Determinants

	Model 1 XEFF	Model 2 SEFF
DEP	.4233 (0.0000)*	.1423 (0.0000)*
Log Ln	0.5862 (0.0005)	.4652 (0.0000)*
EAG	0.8121 (0.0000)*	.5623 (0.0000)*
BR	-. 31552 (0.4210)	-.3486 (0. 5210)
FAG	-.43560 (0.3256)	-.3486 (0.5200)
CONS	10..3744 (0.0000)*	12.13794 (0.0000)*
Adjusted R2	46.32%	36.25%
Walid Chi2	176.8 (0.0000)*	146.52 (0.0000)*
F-test	53.4 (0.0000)*	65.2 (0.0000)*
LM test	128.6 (0.0000)*	114.5 (0.0000)*
Hausman Chi2	5.6 (0.8546)	6.2 (0.7869)

Source: Author's Computation

DEP- Deposit growth rate, Log Ln- logarithm of total loans, EAG-Earning asset growth rate, BR- Branch Growth rate, FAG-Fixed Asset Growth

6.4.11. Summary

This part of the study has explored the efficiency level of banks using cost, revenue and profit models. It has used the Data Envelopment Analysis score to examine the efficiency level of banks under both constant and return of scale. In addition, it has explored the scale efficiency of all the models. The study finds that

banks efficiency level has witnessed a wide variation across various bank groupings. The study has also finds that the state banks efficiency has been consistently on the efficiency frontier reflecting the high dominance of the banks in the Ethiopian banking system. In addition, the study finds that the small private banks efficiency is growing overtime while the middle size private banks are facing difficult to improve their level of efficiency. The parametric and non-parametric tests also witness that state and private banks possess different management and technology capabilities. This shows that despite the scale advantage the state banks have, the difference in their management and technology capabilities has contributed for better efficiency performances. On the other front, the statistical test on efficiency determinants shows that deposit growth rate, loan size and earning asset growth are positively and significantly related to efficiencies. Nevertheless, branch size and fixed asset growth rate are negatively and insignificantly related to efficiencies. Consistent to such finding, the benchmarking practice suggests that banks holding excessive deposits limiting their intermediation activities are disadvantaged to count on their efficiency performances. Some of the results from this section of the study such as top efficiency score of state banks and efficiency determinants are unexpected and are explained further in the qualitative study as to their reasons.

6.5. Testing the Impact of Internal Factors on Bank Performance

The aim of this part of the research is to investigate the impact of bank specific factors, which are highly related to internal management of resources, on performance of banks. In such endeavor the banks own undertaking to excel in performance through managing some of the key selected determinant factors will be examined through testing a further hypothesis: Ho: Bank Specific Variables has no impact on the Performance of Banks. The study uses the CAMEL framework which is a widely used performance monitoring tool by regulators to set variables and establish relationship with performances.

6.5.1. Model Construction

In order to test the effect of bank specific factors on performances several models have been derived. The basic model is primarily follows the commonly used regulatory approach to measure performance of banks across various parameters. The CAMEL rating system which was introduced by the Basel and commonly accepted regulators across countries including the National Bank of Ethiopia considers rating for its individual components: **C**apital Adequacy **A**sset Quality, **M**anagement, **E**arning and **L**iquidity. The aggregate rating will be a derivative of the result on each individual composite rating. Therefore, the a priori assumption on each rating is expected to have a positive relationship with bank performance. In other words a bank scoring well in each component is believed to performing well on composite basis. Therefore based on such framework the model is constructed as follows:

$$\text{Per}\%_{i,t} = \beta_0 + \beta_1 \text{BSF}\%_{i,t} + \epsilon_{i,t} \dots\dots\dots(6.5.1)$$

Where Per %_{i,t} is the proxy of bank performance measure for bank i in period t (for detailed definition of the variable refers the conceptual framework on dvariable setting section of Chapter Five); BSF%_{i,t} is estimated bank specific variables for bank i in period t; and $\epsilon_{i,t}$ is the error term.

Based on the CAMEL framework the above model is then extended to incorporate proxies for each component:

$$\text{Per}_{i,t} = \beta_0 + \beta_1 \text{CAR}_{i,t} + \beta_2 \text{PRTL}_{i,t} + \beta_3 \text{NIITI}_{i,t} + \beta_4 \text{XEFF}_{i,t} + \beta_5 \text{COIN}_{i,t} + \beta_6 \text{LATD}_{i,t} + \epsilon_{i,t} \dots\dots\dots(6.5.2.)$$

Where CAR is capital adequacy ratio, PRTL- provision to total loans, NIITI- Non-Interest Income to Total Income, XEFF- managerial efficiency, COIN- Total cost to Total income, LATD- Liquid assets to Deposits. The summary definition of each variable is as shown below.

6.5.2. Variable Definition and a priori assumption

The independent and dependent variables are chosen from six proxies of bank specific factors and three performance indicators that have been collected from interview and the regulatory organ formats of bank rating with an added variable from the literature and the study result from efficiency assessment. The definition and the expected relationship are framed based on the literature work and interview findings. These are displayed on the below table:

Table 6.17: Variable Definition and CAMEL Category

Variables	Definition	Representation in CAMEL Category	Expected relationship
Dependent			
ROA	ability of a bank’s management to generate profits from the bank’s assets		
ROE	the return to shareholders on their equity		
NIM	residual of interest income resulted from efficient decision making of management		
Independent			
CAR	Capital adequacy ratio- computed as percentage of capital to asset	Capital Adequacy	+/-
PRTL	Provision to Loans- ratio of provision expenses to total loans	Asset Quality	-
XEFF	Managerial efficiency measure using DEA scores	Management	+
NIITI	Non-Interest Income to Total Income measures the share of earning from non-intermediation sources	Asset Quality	+
COIN	Cost to income- share of aggregate income from the total income	Management	-
LATD	Liquid Asset to Total Deposit- the share of liquid asset from total deposit .	Liquidity	+/-

Source: Author’s Computation

6.5.3. Data and Data sources

The data used in this part of the study mostly relies on secondary data sources. This is gathered mainly from the financial records of each bank as well as various publications and data bases of the NBE.

6.5.4. Descriptive Statistics

In terms of maintaining asset quality records through controlling of non-performing assets, the ratio of PRTL shows that banks on average are holding a provision level of around 4% of their outstanding loans. This is a bit higher than the provision required for outstanding loans had all loans been in pass status and is closer to the provision required for loans under special mention status (3%) as per the directives of the NBE (SBB 43/2008). Therefore, based on such comparability, the level of industry wide problem asset stock does not seem significant. The worrying issue is the variation across banks is significant with a standard deviation closer to 5 and a maximum PRTL record of 28% (Table 6.18). The distribution measure through skewness also shows an asymmetrical distribution with a long tail to the right with higher positive value. Therefore, despite the good record of managing assets at sector level, there appears a notable difference across banks in terms of managing their credit exposures which is costing some banks up to 28% of their lending in the form of provision expenses. This remains to be a worrying concern of a regulator which has set a directives/circular for banks to maintain their non-performing loans to 5% of their outstanding loans which later revised even to a reduced level ,3% as per a circular issued in relation to meeting the Growth and Transformation Plan of the country (BSD09/2015). The other parameter, NIITI, which is indicative of the banks attempt to ensure a diversified business mix through operating in non-interest income sources also witnessed an encouraging trend. The mean score shows that banks were generating around 43% of their average income from non-interest income sources which are basically related to foreign exchange transactions, commissions from off-balance sheet exposures, service related fees etc. This seems following the global trend which is now shifting towards fee based sources that are serving as an additional income outlet to banks through providing wide spectrum of services to their customers. The reason behind such trend is due to the decline in interest income from intermediation business which is highly dependent on banks capacity to mobilize deposits from customer bases. The less growth rate in deposit market and the high competition level coupled with various regulatory measures (e.g. bill purchase) affecting the lending productivity seems shifting the Ethiopian banks to work more towards searching for other income bases. The variation however is still strong in such parameters where some banks seem by large reliant of the

non-intermediation business for their income sources while others are still dependent on the traditional intermediation business as their earning sources.

Table 6.18: Descriptive Statistics of Bank Specific Variables

Stats	ROE	ROA	NIM	CAR	PRTL	NIITI	XEFF	COIN	LATD
Mean	18.996	2.233	4.547	14.389	3.901	43.357	84.332	65.817	50.143
Max	90.820	5.250	10.160	54.464	28.972	76.687	100.000	89.231	137.705
Sd	12.880	1.107	1.806	7.505	4.702	13.158	12.467	26.079	18.951
P50	18.318	2.420	4.400	12.385	2.451	42.457	84.975	61.285	47.397
Kurtosis	9.264	2.724	2.916	9.644	10.855	2.812	4.954	17.553	4.920
Skewness	1.684	-0.309	0.263	2.069	2.554	0.042	-0.916	3.315	0.997
P75	24.806	2.999	5.633	17.364	4.637	52.151	94.656	71.771	60.796
OBS	193	193	193	193	193	193	193	193	193

Source: Author's Computation (STATA 12)

With regard to cost control, the aggregate cost to income ratio for the industry on average is 65% (Table 6.18). This witnesses the fact that banks are expending 65 cents in their various engagements to generate a 1 Birr income per their transactions. The large variation is also an indicative for the existence a wider room for improvement for some banks with regard to controlling their expenditures. On the liquidity front, the liquid asset to deposit ratio, a commonly used measure of liquidity level by the NBE, shows that during the periods considered, banks are operating at a reliable level of liquidity. Despite occasional adjustment in the regulatory requirement, the level of LATD appears to exceed the standards of the NBE (15%) and witnesses a high liquid asset stock holdings (SBB/57/2014). This is in line with the argument for the growth in the share of non interest income sources which is enforcing banks to operate under a high liquidity position through maintaining significant balance of liquid asset bases such as foreign deposits. This is in fact usually offset by the counter side off balance sheet commitments already allocated for letter of credit and other mode of trade payments. However, the ratio is still strong if one considers the easily convertible and liquid nature of the accounts.

6.5.5. Pearson Correlations

Investigation of the relationship between variables with a Pearson correlation coefficient and result from the significance value shows that in most of the variables the probability of getting a correlation coefficient this big in an

observation of 193, if the null hypothesis were true, is very low. Hence, we can gain confidence that there is a genuine relationship between the variables in the model. For instance, the relationship between CAR and the dependent variables (ROE, RoA, NIM) is much strong and negative with regard to the return on equity than others due to the impact of change in capital on the level of returns from equity holdings. The negative and strong relationship will not be a surprise considering the usage of capital as a denominator in computing the return on equity; therefore, an increase in capital has a reverse impact on the earning to equity ratio and vice versa. In addition, the variable has significant relationship with other explanatory variables of which it is strongly and positively related to liquidity and cost to income measures. The positive relationship with liquidity supports the argument for the use of capital as a buffer stock in case of liquidity problems and its association with cost to income is related to the lack of its productive usage in a situation of excess liquidity standing. The CAR is also strongly but negatively related to PRTL, XEFF and NIITI. But the coefficient is modest with regard to NIITI. The association basically emanates from the pressure of high nonperforming assets (high risk scenario) on capital cushion, challenge to manage and plan capital usage in excess liquidity and under regulatory involvements scenario as well as the limited effect of capital to create non-interest income despite its notable contribution to boost the currency holding position of banks.

Similarly, the asset quality measure (PRTL), is negatively associated with most of dependent and explanatory variables. The association could not be a surprise considering the impact of a problem asset stock on most of profitability, price and liquidity measures. The rationale behind such relationship lies on the impact of credit risk on the cost of credit through affecting provision expenses, narrowing intermediation margin through affecting the interest recognition from loans and tiding the flow of funds from loan collections as a result of default and/or late payments.

Table 6.19: Correlation Matrix of Bank Specific Variables

		Correlations								
		ROE	ROA	NIM	CAR	PRTL	NIITI	XEFF	COIN	LATD
ROE	Pearson Correlation	1								
	Sig. (2-tailed)									
ROA	Pearson Correlation	.652**	1							
	Sig. (2-tailed)	.000								
NIM	Pearson Correlation	-.143*	.023	1						
	Sig. (2-tailed)	.047	.752							
CAR	Pearson Correlation	-.520**	-.165*	.344**	1					
	Sig. (2-tailed)	.000	.022	.000						
PRTL	Pearson Correlation	.122	-.168*	-.244**	-.435**	1				
	Sig. (2-tailed)	.090	.020	.001	.000					
NIITI	Pearson Correlation	.129	.309**	.019	.018	-.030	1			
	Sig. (2-tailed)	.074	.000	.793	.799	.679				
XEFF	Pearson Correlation	.194**	.147*	-.036	-.238**	.269**	-.120	1		
	Sig. (2-tailed)	.007	.042	.624	.001	.000	.096			
COIN	Pearson Correlation	-.621**	-.736**	.138	.510**	-.031	-.159*	-.331**	1	
	Sig. (2-tailed)	.000	.000	.055	.000	.669	.027	.000		
LATD	Pearson Correlation	-.283**	-.239**	.118	.501**	.095	.280**	-.309**	.384**	1
	Sig. (2-tailed)	.000	.001	.101	.000	.188	.000	.000	.000	

** . Correlation is significant at the 0.01 level (2-tailed). N=193

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Author's Computation (SPSS 20)

Another important relationship derived from the correlation table is that the negative and significant relationship between LATD with both profitability and efficiency measures (Table 6.19). This is in line with the argument that liquidity establishes a trade off with profitability through resulting in a relationship where an increase in liquidity impacts profitability to the negative through limiting the share of productive assets in the portfolio of the Bank. Therefore, balancing such trade-off through maintaining an adequate liquidity level without compromising the profitability opportunity through efficient use of funds remain a challenge to be tackled by Banks management. An ineffective use of fund therefore not only affects the profit level but affects the efficiency level of banks through affecting the cost of idle fund.

Overall speaking, the correlations among the independent variables are not high (less than 0.50), indicating that there might be no serious Multicollinearity problems existing. Gujarati and Porter (2009) suggest that if the pair-wise correlation coefficient between two independent variables is in excess of 0.8, then multicollinearity is a serious problem. Therefore, considering the correlations

among variables and the tests in the following sections, the models to test the hypothesis are built.

6.5.6. Outliers and Missing Values

Before applying the econometrics models to the data, it is necessary to address the potential problem of outliers and missing values as they may have an undesirable influence on the estimates produced by the regressions. A univariate statistics showing summary for missing and extreme values is computed (Table 6.20). The result shows that there are no missing values that are likely to lower the quality of panel data but the data for some variables holds extreme values. For instance, the univariate statistics of variables presented in the table below shows that there are six extreme values in the dependent variable, mainly related to the higher extreme. Therefore, in order to reduce the potential bias caused by the outliers, the variables in the Models are winsorized³ at the 5% and 95% levels. In other words, the top and bottom 5% values of CR% are replaced by the value at the 5th and 95th percentiles, respectively. Therefore, the winsorized output is used as the dependent and explanatory variables for the Models. This is justifiable in consideration of uneven financial records of banks during the early year of entrance to the industry. Newly formed banks usually show a lower profitability record resulting from high capital expenditure for establishment costs, branch expansions, IT investments, low level of asset portfolio and income.

Table 6.20: Univariate Statistics of Bank Specific Variables

	N	Mean	Std. Deviation	Missing		No. of Extremes ^a	
				Count	Percent	Low	High
RoE	193	18.9962	12.87965	0	.0	0	6
RoA	193	2.2333	1.10661	0	.0	0	1
NIM	193	4.5473	1.80649	0	.0	0	1
CAR	193	14.3889	7.50490	0	.0	0	11
PRTL	193	3.9012	4.70174	0	.0	0	18
NITI	193	43.3567	13.15770	0	.0	1	0
XEFF	193	84.2089	12.55139	0	.0	2	0
COIN	193	65.8174	26.07931	0	.0	0	8
LATD	193	50.1431	18.95113	0	.0	0	4

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

Source: Author's Computation (SPSS 20)

³ There are different ways of dealing with outliers, such as winsorisation, exclusion, or retention. In this study, since the number of observations is not large, and the extreme values are likely to seriously bias the estimates, either exclusion or retention seems to be inappropriate. In this study, all winsorizing are done based on full sample rather than on balanced sample i.e. on the 193 cases.

6.5.7. Tests of Stationerity

Graphical Observation of the variables shows that the variables selected don't exhibit non-stationerity. Further test based on a mathematical approach is done applying the Fisher Type unit root test which is based on the augmented Dicky-Fuller tests. The Fisher Type appears more pertinent considering the unbalanced data stock on pane I(longitudinal). Therefore, the basis hypothesis H_0 : All pane I(longitudinal)s contain unit roots is tested and the result witnessed that all variables are stationery at zero ADF(annex 11). Therefore, the variables can be used in the model without being differenced or further action.

6.5.8. Results and Discussions

Before running the model both normality and panel unit root tests were conducted. The normality test through kurtosis and skewness witnesses the normality of the data (annex 10). As shown in the below table, both the F-test and the LM test with large chi-square result rejects the null hypothesis. Hence, the fixed and random effect models appear better than pooled OLS. The Hausman test taking the coefficients of the fixed and random models tests the null hypotheses that H_0 : difference in coefficients not systematic. The chisquare result is with probability lower than 0.05 rejects our initial hypothesis that the individual-level effects are adequately modeled by a fixed-effects model in case of RoA but not in others. Therefore, the estimation result has been done through the fixed effect model in the RoA model but random effect model is applied in RoE and NIM models.

As shown in the table below among the identified six bank specific determinant factors and applied to model 1 (RoA) four of them were significant and considered to be drivers of the banks' profitability. More, specifically, with regard to the coefficients on the independent variables, CAR remains significant in all the models where it acts as a regressor, suggesting that the ratio of capital to asset has a statistically significant impact on bank profitability and price performances. The unexpected result is that the direction of impact provides a mixed result where the CAR has been found to positively relate to RoA and NIM but remained negative in case of RoE. The negative relationship with RoE however is expected in consideration of the relative impact of capital building on the earning measure through diluting the earning to equity position of banks. Therefore, the growth rate

in capital should follow the proportional growth in the earning base of banks. Otherwise, obstruction on capital planning from internal and external forces potentially result in a counter impact on the RoE of banks.

Table 6.21: Regression Results

	Model 1 RoA	Model 2 RoE	Model 3 NIM
CAR	.0522522 (0.0000)*	-.5180715 (0.0010)*	.0814718 (0.0050)*
PRTL		-.445118 (0.0019)*	-.0199116 (0.5820)
NIITI	.0295337 (0.0000)*	.1060527 (0.0125)*	.0006569 (0.9600)
XEFF	.0108347 (0.0538)	-.0570724 (0.3770)	.663684 (0.5520)
COIN	-.034499 (0.0000)*	-.2449508 (0.0000)*	-.0000826 (0.8980)
LATD	-.5186258 (0.0570)	.0181338 (0.0721)	-.0054677 (0.5710)
CONS	-4.167119 (0.0000)*	42.79821 (0.0000)*	3.277389 (0.0150)*
Adjusted R2	62.8%	45.05%	42.5%
Walid Chi2		152.72 (0.0000)*	54.8 (0.000)*
F(6,168)	57.1 (0.0000)*		
F-test	2.88 (0.0003)*	5.5 (0.0000)*	2.66 (0.0000)*
LM test	4.62 (0.0315)*	54.33 (0.0000)*	9.6 (0.0019)*
Hausman Chi2	216.3 (0.0000)*	8.24 (0.2143)	1.32 (0.4532)
Rho (fraction of variance due to u_i)		.14795143	.14163641

Source: Author's Computation (STATA12)

Considering the sporadic involvement from the regulator in setting the requirement of entry as well as capital threshold for banks already in the business, the impact of capital on earning position remained negatively affecting RoE. This obviously will be severe for banks which already are operating at a capital level in

excess of their asset holdings and/or are managing to operate under limited growth of earning as compared to their growth in their capital level. On the other front, the positive relation of CAR with RoA and NIM, is much related with the notable impact of a high level of capital on business expansion through increasing the capacity of banks to achieve large credit extension for a single borrower and boosting their capacity to hold an increased foreign currency holdings. This will be very relevant to the Ethiopian banking industry where the lending decision to single borrower, 25% of capital (Directives SBB/53/12) and foreign currency positions, 15% of capital (Directives SBB27/01) are directly attached with the capital level by regulations. This has been an important driver for banks to operate under a relatively excess capital level with a motive to register a rapid balance sheet expansion. This has assisted to boost the earning position of banks through directing their activity to a high growth- high earning scenario and without worrying much about liquidity shortfall. This however, has not adequately covered the negative impact of capital on their RoE (or earning per share) which doesn't seem a worry to the banks until recent period considering the high earning per share and dividend offering of the Ethiopian banks . This benign regime however might not sustain in the forthcoming as banks are stipulated to operate under a capital level beyond their expectation and the gradual slowdown in their earnings growth due to a growing competition and regulatory tightening. Therefore, to some extent capital planning remains to be one of critical bank specific determinants warranting management intent in the process to discharge their obligations to various stakeholders, most importantly of the shareholders. This has been one of several reasons enforcing banks management to capitalize on a business mix through focusing noninterest income sources.

On the other hand, the commonly used proxy metrics to measure asset quality, PRTL, has been positive but insignificant in the RoA model and witnessed significant and negative relationship with RoE model. The model related to price (NIM) similarly shows negative and insignificant relationship with PRTL .As shown in the trend and descriptive statistics, the aggregate PRTL level is towards a positive track record revealing the banks remarkable achievement in maintaining a healthy asset portfolio through in placing control on the level of their nonperforming asset. This has been not only an internally driven strategy but supported by enforcement from the regulator which insisted banks not to hold

nonperforming assets beyond 5% of their loan portfolio, a high risk asset component. Therefore, the low level of PRTL record observed in most banks in the industry succeeded to establish a positive relationship with the earning position of banks through controlling the cost of asset mismanagement as shown in low rate of provision expenses as compared the loan portfolio. In other words, the effect of provision for problem assets has limited impact on profitability performances justifying for the insignificant relationship with the RoA and RoE. Nevertheless, the mixed outcome with regard to the direction of impact mostly relates to the differences in the sensitivity of the base at which the two ratios are computed i.e. asset and capital. Banking is a highly leveraged business with most of its sources of businesses relies highly on liability from customers than shareholders investments leading to hold asset level far exceeding the capital invested by its shareholders. Such scenario potentially has put banks capital more sensitive to earning disorder from asset quality related problems as compared to the level of banks. This can be easily justified if one considers the coefficient values of PRTL in the two models. In contrast, the pricing measure establishes a negative and significant relationship with PRTL due to the double effect of nonperforming assets on net yield from intermediation activity. On one front, nonperforming assets potentially reduces the level of interest income from lending business through restricting the earning from problem assets. This is because income recognition from problem assets is not allowed unless the asset is backed by cash and cash substitute collateral (Directives SBB/43/08). On the other front, problem assets will bring additional costs in the form opportunity cost of unproductive use of interest bearing deposits besides the demand to set aside provision based on the classification level of the problem asset. Therefore, the double side impact results in a narrow interest income that provides a narrow interest margin justifying a negative relationship of PRTL with NIM.

The other measure applied to assess banks' capacity to ensure a diversified income sources through establishing appropriate level of business mix, NIITI remained a significant driver of profitability measure. Nevertheless, it has insignificant effect on the price related performances. The direction of relationship, however, is positive in all models considered. The established relationship goes well with the a priori assumption due to the obvious effect of a diversified and hence increased income bases on the gross income and profit level of banks. In

addition, the macroeconomic framework of the country remained suitable for banks to generate a substantial income in their foreign trade offerings granting a liberty to set charges of their discretion for their international banking services and during currency selling. The liberty of charging basically emanates from the shortage in the availability of foreign currency due to high unmet demand from the business community that are engaged in import related businesses. Therefore, a bank holding a reliable level of foreign currency obviously manages to easily convert its foreign assets to fee based income and associated gain from currency conversions. Additionally, a high demand in off balance sheet related services such as issuing guarantees and offering domestic banking services ensured another source of fee based services increasing the income base of banks. The aforesaid services have contribution not only on the income base of banks but on the overall risk portfolios through directing their activities on almost risk free services bearing a lower impact to affect their income positions. The insignificant relationship with price measure is basically is a result of a loose association between NIM, which is basically a measure of the yield from intermediation business and NIITI which covers businesses exterior to the traditional banking engagements. Therefore, NIITI is not much affected by a change in the price for earning assets and the cost of fund for deposits as a result of its distinct pricing mechanism and limited use of locally mobilized deposits.

An important finding from the empirical result is that management's ability to control costs has a negative impact in all the models. This suggests that in addition to banks' endeavor for boosting revenue through engaging themselves in diversified businesses, their specific experience in managing expenses appears to be an important factor in determining performance. More specifically, the COIN ratio established a statistically negative significant relationship to the profit based models witnessing the fact that the cost of undertaking banking business is one of the prominent variables requiring the managements' focus. Lack of proper cost control could potentially drain profit of banks and its effect as revealed in the coefficient is much strong on RoE. This will be an important finding of the study because it instigates management to have careful considerations on their cost of doing business during critical cost driven decisions like expansions through branch network, IT investments, e-banking channels, employment etc. On the other front, the study contributes a variable which can serve to assess

management performance during rating by the Board or the regulator which mostly prefers to do it applying simple ratios as witnessed during the interview sessions. Such approach has an obvious drawback of aggregating costs potentially hiding the effect of individual cost components through offsetting their under and over usage. Nevertheless, the aggregate position serves as an initial start to look for the affixed cost management capacity in banks. The COIN relationship with price measure, NIM, is insignificant which could be associated with the current interest rating setting regime reigning in the system. The interest rate in both asset and liability side naturally seems variable but in practice has a fixed nature due to limited variation in interest rate applied both lending and deposit side. This has provided an opportunity for banks to run under a stable yield curve, hence, the burden to manage expenses through price controls appear irrelevant or deserved a reduced merit justifying for the insignificant relationship with the price related variable. Nevertheless, the negative relationship provides indication an existing concern to manage costs through controlling factors that have implication on both cost and income. Such factors as discussed above include maintaining healthy asset portfolio, managing deposit mixes, etc. among others. Supporting this argument, the managerial efficiency measure, the XEFF, shows that performance of some banks could be improved through increasing the efficiency of management. The established relationship in some models, however, is not statistically significant that indicates a homogenous management approach. However, as shown in previous section and suggested in the interview, managerial efficiency is one of the area deserving improvement and to be considered for building competitive advantage in the Ethiopian banking system .

On the liquidity front, a mixed result has been witnessed in the three models with a negative relationship record in the RoA and NIM models and a positive relationship with RoE. This is in line with the literature where the impact of liquidity is reflected depending upon the usage of liquidity to optimize the liquidity-profitability trade off. Surplus liquidity holding ensures a comfortable status to meet commitments at ease but drains profitability by increasing vulnerability to growing expenses on excess fund holding. As indicated in the descriptive statistics, the Ethiopian banks are mostly characterized by surplus liquidity holdings maintaining a liquid asset level far above required by the regulatory standard. Therefore, the impact of such norm has negatively affected profitability

measures as well as placed a pressure on the productivity of their intermediation businesses. This is a signal for the lack of in-placed strong liquidity management that can ensure an optimum usage of funds. As shown in the models, the impact of the above constraint has been significant on both profitability and price performance sides with notable exceptions on the RoE model. The explanation for the exception is in relation to the reduced pressure arising from surplus liquidity on the capital planning of banks. Planning for capital growth, therefore, appears much slower in circumstances of excess liquidity unless it is driven by exceptional business motive and fulfilling regulatory requirements. This remains an important finding of the study indicating that banks in the Ethiopia still have a way to boost their earnings not only aiming at further expansions but also ensuring their capacity to establish a liquidity-profitability trade off. In addition, their liquidity position among several factors could be considered as an important variable in their capital growth decisions.

6.5.9. Robustness Test (Specification Tests after the Result)

The residual statistics shows the error term has a normal distribution with a mean of 0. Hence, the normality assumption holds. The results from the VIF table suggest that VIF is not greater than 10 for any of the explanatory variables. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity test shows that at 5% level of significance, the p-value is higher showing that heteroskedasticity is not significant in the model. The small value of chi-square also supports the constant variance of the error term. The result has shown that the D-statistic (1.273) appears closer but lesser than 2 depicting positive correlation. As suggested by Field (2009), values less than 1 or greater than 3 are a cause of concern. Hence from Field's rule of thumb it can be inferred that autocorrelation is not serious (see annex for all tests).

6.5.10. Summary

This part of the study has investigated one of the key research questions: how do bank specific factors are related to bank performance? The model constructed is framed based on the commonly used supervisory tool to monitor bank performance: CAMEL. This consists of elements from Capital Adequacy, Asset

Quality, Management, Earning and Liquidity. It has used six variables representing each of the components and run a regression model based on fixed and random models. The outcome shows that many of the bank specific factors have a significant statistical relationship with performance measures. Most importantly, the result explored that bank's capital holding, asset quality and business diversification, cost control and liquidity positions are important part of the management decisions to have a significant influence on performances.

6.6. Testing the Impact of External Factors on Bank Performance

The theme of this section of the quantitative data analyses is to explore how different external factor variables affect bank financial performances. This section investigate one of the research questions of the study: how different industry and macroeconomic r factors are related to performances, and then presents the empirical results of these models. The model run therefore explores two key hypotheses: Ho: Industry factors have no impact on bank performances and Ho: Macro economic factors have no impact on bank performances. The model constructed is based on the conceptual framework set in the previous section.

6.6.1. Model construction

Several regression models are introduced so as to examine the impacts of external factors consisting of both sector and macroeconomic variables on performances. As pointed out in the literature review, external factors are defined to consist of factors which are beyond the control of bank management. From the interview experience and extant literature, it appears obvious that bank performance could be affected not only by bank specific scenarios, but also has influence arising from the situation in the external environment. As discussed above, two sets of hypotheses were built based on the research questions of the study. Therefore, the model constructed should have considerations for both elements of an external factors i.e. sector and macro economic variables. The purpose is to test a relationship between each factor representing sector and macroeconomic scenario with bank performances. Hence, the model can be formulated as shown below:

$$Per_{jt} = f(SS_t, MS_t) \dots\dots\dots(6.6.1.)$$

Where Per_{jt} represents performance measure/s for bank j during period t; SS_t are sector specific external determinants at time t and MS_t are macroeconomic variables at time t. The general model to be estimated is of the following linear form:

$$pER_{jt} = \beta_j + \sum \beta_k X_{jt}^k + \varepsilon_{jt} \dots\dots\dots (6.6.2.)$$

$$\varepsilon_{jt} = V_i + U_{jt}$$

Where Per_{jt} is the profitability of bank j at time t , with $i= 1\dots N$; $t=1\dots T$, β_j is a constant term, X_{jt} are k explanatory variables and ε_{jt} is the disturbance with v_j the unobserved bank-specific effect and u_{jt} the idiosyncratic error. The explanatory variables are grouped as per equation 1 as industry specific and macro-economic specific determinants. Hence, substitution of equation 1 in to equation 2 yields the following general specification model:

$$Per_{jt} = \beta_j + \sum \beta_k X^{SS}_{jt} + \sum \beta_k X^{MS}_{jt} + \varepsilon_{jt} \dots \dots \dots (6.6.3.)$$

Where, the x_{jt} with superscripts SS and MS represent the sector specific and macro-economic specific determinants as stated in equation 1.

More specifically, the econometric model can be expressed in mathematical form incorporating the identified variables. In order to allow for the inexact relationship among the variables as in the case of most economic time series, variables error term ' $\varepsilon_{i,t}$ ' is added to form equations.

Model I:

$$RoA_{i,t} = \beta_0 + \beta_1 MKGD_{i,t} + \beta_2 LGTA_{i,t} + \beta_3 DDTD_{i,t} + \beta_4 RGDP_{i,t} + \beta_5 INF_{i,t} + \beta_6 TRDB + \varepsilon_{i,t}$$

Model II:

$$RoE_{i,t} = \beta_0 + \beta_1 MKGD_{i,t} + \beta_2 LGTA_{i,t} + \beta_3 DDTD_{i,t} + \beta_4 RGDP_{i,t} + \beta_5 INF_{i,t} + \beta_6 TRDB + \varepsilon_{i,t}$$

Model III

$$NIM_{i,t} = \beta_0 + \beta_1 MKGD_{i,t} + \beta_2 LGTA_{i,t} + \beta_3 DDTD_{i,t} + \beta_4 RGDP_{i,t} + \beta_5 INF_{i,t} + \beta_6 TRDB + \varepsilon_{i,t}$$

Where, RoA, ROE and NIM correspond to performance measures representing profit and prices, MKGD- market deposit growth rate, LGTA- natural logarithm of banks total assets, DDTD- share of demand deposit from total deposit, RGDP- real GDP growth rate, INF- annual inflation rate and TRDB- trade balance .

6.6.2. Variable Definition and priori assumptions

As clarified on the conceptual framework, the explanatory variables are selected mainly from extant literature with a cautious refinement of those factors which are expected to have significant implications on performances. The refinement has been made considering the inputs from the interview with bank experts and

regulatory staff. Therefore, six explanatory variables representing sector and macroeconomic activities are added in the constructed model. The independent variables are related to both profit (RoA and RoE) and price (NIM) measures of performances. This is for the reason that some of the selected variables such as inflation, GDP etc. are expected to have implications not only on the profitability of banks but also on their asset and liability pricing decisions. Therefore, three models consisting of three independent variables are framed to run a regression models on the six explanatory variables. The definition and the expected relationship which are based on the literature work and interview findings are displayed on the below table:

Table 6.22: Definition of External factors

Variables	Definition	Expected relationship
Dependent		
ROA	ability of a bank's management to generate profits from the bank's assets	
ROE	the return to shareholders on their equity	
NIM	residual of interest income resulted from efficient decision making of management	
Independent		
MKGD	Annual growth of the banking sector deposit	+
LGTA	Size of banks- natural log of the total asset of banks	+/-
DDTD	Share of demand deposits from total deposits	+
RGDP	Growth in real Gross Domestic Product	+
INF	Annual rate of inflation	+/-
TRDB	Trade balance as difference between export and import	-

Source: Author's computation

6.6.3. Data and Data Sources

The study uses firm level (mainly commercial banks) as well as aggregate data of the industry and macro economy. As the objective of the study is to explore the effect of the selected sector and macroeconomic factors on individual banks, a panel data set has been applied. The major data sources are the various annual and quarterly publications and financial accounts of NBE, MOFED and commercial banks. Basically, the coverage is from 1999-2015 and consisting of all 18 commercial banks in Ethiopia.

6.6.4. Descriptive Statistics and Trends

The growth in economy as measured by the commonly used standard, the Gross Domestic product (GDP), has been strong with an average real GDP growth rate closer to double digit during 1999-2015. More specifically, the recent period (last five years) performance has been notable and averaged a double digit growth rate record that placed Ethiopia to be among the fast growing economy of the world. The growth rate in economy in all periods considered, except year 2002, has been positive. The negative growth record during 2002/3 is mainly associated with the cyclical draught that prevails in the system in every ten years interval due to adverse climatic conditions. A recovery in the overall economic performance has been registered, especially since 2004, as measured by real GDP. The growth has not only brought an improvement on the aggregate economic performances, but has also brought in a transformation of the economy towards service dominated (MOFED, 2014). This is a new episode considering the long standing agriculture based economy which remained as a mainstay for large part of the population in the country. The recent Growth and Transformation Plans (GTP I and II) also asserted for more transformation and growth in the economy through boosting the performance of export, industry and agriculture sectors. The banking sector is also one of a policy target which is expected to register a 30% growth in loan and deposit performances through opening more branches (25% growth) and offering agent banking services (1 branch to 50 agent). Furthermore, banks are expected to raise their current paid up capital level to Birr 2 billion and maintain their non performing asset level to 5% (NBE Circular MFAD/205/15). Such growth trajectories and policy directions obviously will have implication on the strategy of banks to meet their growth motives. Therefore, the implication of economic performances and policies set, therefore, deserve an exploration towards their effect. This remains to be one of the basic objectives of the study as set out in the research question. This part of the study, therefore, mainly considers the impact of economic growth on banks performance. Specific analysis on sector related regulations and policy directions, however, will be observed in the next section of the study through investigating the impact of regulatory variables on performances.

Table 6.23: Descriptive Statistics of External Factors

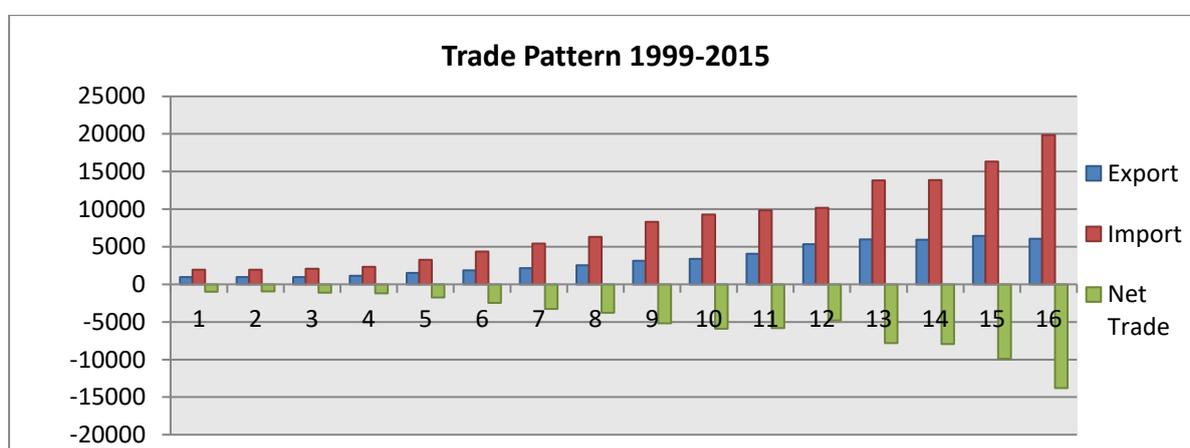
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis		
ROE	193	.00	90.82	18.9962	12.87965	1.697	.175	6.461	.348
ROA	193	.00	5.25	2.2333	1.10661	-.312	.175	-.252	.348
NIM	193	.00	10.16	4.5473	1.80649	.265	.175	-.055	.348
RGDP	193	-2.10	12.60	9.0886	3.48685	-1.888	.175	2.896	.348
TRDB	193	-216648.5	-7135.00	-84371.2	70757.7	-.596	.175	-1.026	.348
INFL	193	-10.60	36.40	12.8699	11.54748	.614	.175	.003	.348
MKGD	193	10.27	43.98	23.4189	8.49858	.684	.175	.520	.348
LGTA	193	4.33	12.53	8.0527	1.45669	.434	.175	.423	.348
DDTD	193	10.01	70.20	32.0270	12.20197	.787	.175	.185	.348
Valid N (listwise) 193									

Source : Author's Computation

The other variable, net trade (TRDB), has been negative throughout all the periods considered in the study as the country buys more goods and services from abroad than it sells resulting in net trade deficit. Trend wise, the trade balance also deteriorated in relation to high import growth which is again due to the country's high demand in investment goods to develop the economy. A further split of the trade deficit shows that foreign exchange earnings from export of goods and services have exhibited a growth magnitude but dominantly at a decreasing rate (Chart 10). This is mainly due to inherent structural problems in tradable goods as well as price and demand volatility and stiff competition in the international market (NBE report, 2016). However, the recent period record shows a decreasing trend owing to the above stated factors and contributing for the wider merchandise trade deficit. In contrast, merchandise import has been progressively growing consuming foreign currency level beyond that earned by export of merchandises. This in short has put the country in general and the commercial banks in particular in a foreign currency liquidity stress situation. Such scenario could explicate the fact for the prevalence of a stiff competition among banks to attract more exporters so that they could advance their performances through offering foreign currencies to the needy importers. From the interview result, it is revealed that a bank succeeds to channel 1 USD creating around 1 Birr income in the form of trade and revaluation gains. Nevertheless, the exchange rate in Ethiopia is managed and banks are expected to get earnings from foreign exchange transaction through setting the difference between buying and selling

exchange rate not exceeding 2%. The banks, however, have the discretion to set the fees and commissions collected through offering international banking services. This section of the study, therefore, aims at examining the effect of the availability of foreign exchange that mainly originated from export earnings on their performances. It has used the trade deficit level to examine the dual effect of export and import activities on banking performances. However, impacts from policy framework such as managed exchange rate will be assessed in the next section of the study.

Figure 6.6.: Trends in Export, Import and Trade Deficit from 1999-2015



Source: Author's Computation

With regard to Inflation, the past year records show that inflation in Ethiopia has been low. However, the recent period records show that the economy has been operating with high inflationary spiral. It has been steadily soaring and creeping up in the recent period despite good harvest of agricultural produces. The general inflation reached 36.4% in year 2009/10, but has recently been reduced to single digit level in 2014 and 2015 owing to various policy measures and commitment of the government to contain inflation at single digit level (GTP II, 2015). As pointed in the literature review, the impact of inflation on bank performance has been widely considered in studies but its direction of impact has no conclusive a priori. However, there is a consensus among scholars regarding the impact of high inflation on economic performance through discouraging savings and hence investment. In the Ethiopian context, due to lifted inflation, the real saving rate has been negative in all periods considered. Similarly, the lending rate remained positive in most years of the period, but has been negative during the years with

hyper inflation records. Therefore, with such framework and as confirmed during interview, inflation remained to be an important factor to be considered as to its impact on bank performances.

At the backdrop of such macroeconomic profile, however, the banking industry, as measured by deposit market growth rate (MKGD), has been expanding well with average growth rate of 23% during 1999-2015. The variation in growth rate, however, is significant with a range of 33% and the industry growth in some periods reaches to the maximum of 43%. Therefore, the banking industry seems successful in the resource mobilization front that contributed well to the sector balance sheet expansions and earning performances. This has been well observed in the other sector related variable, banks size (LGTA), which has maintained around Birr 437 billion asset reserve with a similar growth trend with the growth of the industry deposit.

The other variable in the study, the share of demand deposits from total deposit stock, measures the impact of availability of cost free deposits on performances. The average share of demand deposits on total deposit is 32% with a noted significant variation. The high share demand deposit is expected to contribute to good performances through reducing the interest paid on deposit mobilized from the market.

6.6.5. Pearson Correlations

The correlation between explanatory variables in most of the variables is not large to pose multicollianrity problems. Nevertheless, the relationship among most explanatory variables is significant to provide confidence that there is a genuine relationship between the variables in the model. For instance, the relationship between TRDB and all other explanatory variables has been negative and significant. The widened trade deficit impacts the growth in the market, bank size and the possibility of mobilizing cost saving deposits. Furthermore, the impact of negative trade deficit also extends towards macroeconomic variables through negatively economic growth, the consumer price index. This follows from the diverse effect of a trade deficit on the capacity of the industry to raise resources from foreign exchange earnings, constraining investment endeavor as a result of shortage in foreign currencies, exposing the economy to imported inflation etc. among others. On the other front, except with trade deficit, the real GDP growth

rate has established a positive correlation which is a result of a good performance economy on the sector growth, on cost effective resource mobilization and stable prices. Similarly, all sector specific variables are positively and significantly related to each other signifying among others a well growing banking sector. This causes a cost effective resource mobilization and remains suitable for the growth in the size of banks in the system.

6.6.6. Model pre-test

The Fisher Type unit root test which appears more pertinent considering the unbalanced data stock on panel is used to test stationarity. Therefore, the basic hypothesis H_0 : All pane l(longitudinal)s contain unit roots that are tested and the result witnessed that all variables are stationery at zero ADF. In addition, the normality test through kurtosis and skewness witnesses the normality of the data (annex 11). As shown in the table below, both the F-test and the LM test result reject the null hypothesis (Table 6.24). Hence, the fixed and random effect models appear better than pooled OLS. The estimation results are presented based on the result of the Hausman test as shown in the regression table below.

6.6.7. Empirical Results

The impact of the economic growth rate (RGDP) on bank performance is positive and significant in the profit models. The result is in line with the a priori restrictions justifying the significant impact of economic growth on the profitability of banks. The result will not be a surprise considering the effect of a high growing economy in enhancing the credit demand and saving propensity of bank customers from the mounting per capital income. Therefore, banks enjoy a comfortable platform that enhances their earning from the intermediation business. In addition, a well functioning economy poses less threat of credit default that potentially reduces the exposure of the Banks profit to problem asset related expenses. Nevertheless, unexpectedly, the impact of RGDP on the price measure (NIM) is negative. The relationship, however, poses that in times of good economic performances banks' price on credit and/or resource mobilization is negatively affected. As per the conventional demand theory, this is due to the fact that a high demand for credit lowers the lending price as a result of abundant credit offering in the system. Nevertheless, banks could not have discretion to similarly respond to excess

supply of resources (deposits) in the market as the minimum interest rate on saving and fixed time deposits is already affixed by the regulatory organ. The relationship, however, is not significant. Yet, the study considered requires further explanation during the interview session with bank managers and regulatory experts.

Table 6.24: Regression Results for External Factors

	Model 1	Model 2	Model 3
	RoA	RoE	NIM
RGDP	.0743999 (0.0010)*	.5339852 (0.0230)*	-.0153796 (0.7120)
TRDB	-4.61023 (0.0000)*	-.0000285 (0.0470)*	-.7.3600 (0.0100)*
INF	.0061726 (0.3190)	.0399411 (0.5350)	.0007228 (0.9510)
MKGD	.0317477 (0.0030)*	.2771313 (0.0130)*	-.0002193 (0.0991)
LGTA	-.1153088 (0.1170)	2.945425 (0.0180)*	-.0000826 (0.6940)
DDTD	.0110495 (0.1600)	.1558825 (0.1420)	.0105274 (0.3880)
CONS	1.514032 (0.0090)*	-13.99182 (0.1130)	4.176232 (0.0000)*
Adjusted R2	36.6%	34.4%	31.0%
Walid Chi2	86.6 (0.0000)*	152.72 (0.0000)*	16.37 (0.119)*
F(6,169)		14.53 (0.0000)*	
F-test	4.25 (0.0000)*	10.3 (0.0000)*	3.03 (0.0100)*
LM test	27.6 (0.0000)*	101.3 (0.0000)*	7.9 (0.0050)*
Hausman Chi2	1.96 (0.85430)	15.74 (0.0076)*	2.33 (0.3252)
rho(fraction of variance due to u_i)	.16203462	.64914329	.04567747

Source: Author's Computation (STATA 12)

The impact of trade deficit on performances falls out in a consistent result among all models considered. In other words, the result shows that being a net importing country has a negative and significant impact on both profitability (RoA and RoE) and price (NIM) measures. The result, therefore, points that the widening trade deficit should be one of the determinant macroeconomic variables to be considered by the government in its policy framework to improve bank performances. Most importantly, economies with enormous trade deficit that derived from the double edge impact of a rise on import demand and deteriorating export performances could potentially impact their banking performances. The sluggish growth in earnings from export affects the capacity to mobilize both local and foreign currency denominated resources from the market.

The effect of such trend remained significant because of its strong effect on both channels of the banks income sources. On the one side, less export earning affects the intermediation business through limiting the opportunity to raise abundant local deposits. On the other front, it affects the earning from international banking activities by channelling lower amount of foreign currency to the banking system. Most importantly, the limited export earning leads to unfair competition and behavior to reign in the system. This has been one of the issues attracting regulatory involvement and that attempted to address the problem through instructing banks to entertain customers request for foreign currencies on first come first serve basis (with the exclusion of priority sectors like manufacturing). The intent of the involvement is to reduce the rent seeking behavior and unfair competition in the system. Similarly, unparallel rise in import activities with export also creates a foreign currency liquidity shortage that affects the swiftness of trade and the timely collection of earnings. In such scenario, importers are obliged to remain in the banks' waiting list to demand for foreign currency allocation. This obviously affects the trade facilitation role of banks as well as their plan for timely disbursement of credits. Therefore, the intermediation role is affected to timely generate income from loan disbursement to the import sector.

Another variable entertaining consistency of result across the models is inflation. The study finds that the annual rate of inflation has established a positive relationship with performances. The result suggests that better bank performances are related in times of high inflation. This remains to be unexpected

result considering from theoretical and practical scenarios. From theoretical view point, a growing inflation rate is expected to affect performance of the economy making consumption expensive. This affects the saving rate in the economy and, hence, lowers the investment fund. This directly affects the growth in the economy and the financial system. From practical perspective, the Ethiopian banking system does not seem to feel the pressure from inflation due to its liberty to set the lending prices following the change in deposit rate that for long period ensures a constant spread. In addition, the variation in both lending and deposit rates was not frequent to disrupt banks' price setting mechanisms leading to almost a fixed rate regime in both asset and liability pricing. Therefore, the expected relationship should either be negative or neutral in line with the theoretical and practical arguments, respectively. The positive relationship, therefore, remains unexpected. Nevertheless, previous literature on the effect of inflation displayed similar confusing result. Some scholars say that the relationship between inflation and bank performance is debatable (Athanasoglo, 2005). The direction of relationship is unclear (Vong and Chan 2009) or the effect depends on whether inflation is anticipated or unanticipated (Perry 1992). Therefore, we opted to present the result of the study to get expert opinion of bank managers and regulatory staff. Their opinions support the fact that the effect of inflation on performance should look beyond its impact on asset and liability prices. The effect, however, provides much sense if one considers the impact of inflation on the debt repayment capacity of borrowers. That is, during the time of high inflation, borrowers' ability to meet commitment is higher as they are enjoying a negative real interest rate (lending rate below the inflation rate). Therefore, banks are exposed to a lower risk of default. In addition, the real negative saving rate during inflationary period allows banks to mobilize cheap sources of funds. Therefore, the net gain of banks depends on the magnitude of impact of a negative lending and saving rate. Nevertheless, the study finds that the relationship of inflation with bank performances is not significant.

The impact of market growth rate (MKGD) established a positive and statistically significant relationship with the profitability measures (RoA and RoE). The result is as expected following the argument as an expanding market provides an opportunity to mobilize resources at ease. Therefore, the intermediation business is reinforced as a result of the strength in the supply side. With a parallel growth in

the demand side (credit), the intermediation activity of banks will be strong to yield notable profitability performances. Nevertheless, the study finds that the growth in market is negatively associated with the price model (NIM). This remains in line with our argument above in which in times of heated intermediation associated to high demand for credits and excess supply for deposits, the lending interest rate will be in pressure. The price on excess supply in funds, however, remained unaffected to get reduced beyond a level set by the regulator. The cumulative impact drives the net interest margin on the declining trend. On the other front, during excess growth of resources that potentially leads to excess fund holding, there remains a growing competition among banks for credit disbursement whose effect on lending prices remains strong. The relationship established, however, is not statistically significant. On the other front, large size banks are also operating in low risk scenario which is affecting to match their profitability level with their asset holdings.

The variable representing banks size, natural log of total assets (LGTA), has a statistically significant relationship in RoE and statistically insignificant relationship with other models. As set out in a priori assumption, the impact of bank sizes on profitability witnesses uncertain effect on performance. This is due to its mixed impact on performances. On the one hand, bank size suggests increased diversification that exposes banks to operate in less risk-low return scenario. On the other front, bank size ensures to gain advantage from economies of scale that positively impacts performance of providing the benefit of low costs operation (Agu,1992). The study results from ROE model supports the later argument where banks' profitability is positively improved by operating at optimum economics of scale. This is consistent with our previous finding on the significant impact of optimum scale of operation on performances and a variable explaining the variation in efficiency among banks operating in the Ethiopian banking industry. In addition, the result also shows that big banks have maintained a reasonable level of capital in line with their profitability trends. As shown in previous sections, capital level determination for big banks is an internal decision, where as, the regulatory set the required capital level for medium and small banks. The study's output in relation to the RoA and NIM model, however, is negative. The argument in such regard as well is consistent with our previous findings (on impact of ownership) in that large banks could be profitable by reducing their prices.

Therefore, optimum scale of operation provides the flexibility for banks to operate in lower net interest margin set-up that turns into market share growth if potentially exploited by the big banks. Nevertheless, the study result on the impact of market concentration on prices shows that big banks are not engaged in collusive behavior to affect the prices in the market. This has provided a benefit to small banks to record a healthier profitability performance by flexibly adjusting prices and without facing a counter response by big banks.

The impact of building a low cost deposit structure through increasing the share of demand deposits in the deposit mix, (DDTD), is positively related to performances in all models. Therefore, the increase in the ratio of demand deposit to total deposit increases the profitability of commercial banks. The result suggests that better performance is not only associated with the size in deposit (market growth as explained above) but also has established an association with banks' conscious decision to direct their resource mobilization towards cost saving deposit types. Therefore, banks ensure increasing profitability record by increasing the share of demand deposits which is a cheaper source of funds. The study result, however, is not statistically significant in case the profitability models. The insignificant relationship in profit models is a result of increase in other deposit types (saving and fixed time) that could reduce the share of demand deposits. In addition, demand deposits by nature are volatile to be withdrawn on demand, therefore, a growth in the share of such deposit types affects the motive to set up a stable deposit structure that can support the lending businesses. Therefore, credit extension decisions are much a result of other stable sources of fund than demand deposits. The price model, however, has a statistically significant relation with the share of demand deposit on total deposits. The relationship is expected as the cost saving advantage from the cheaper deposit type has a downward effect on the effective cost of fund of the entire deposit stock. This potentially reduces the interest expense of banks and widens the net interest margin.

6.6.8. Robustness Test (Specification Tests after the Result)

The residual statistics shows that the error term has a normal distribution with a mean of 0. Hence, the normality assumption holds. The results from the VIF table suggest that VIF is not greater than 10 for any of the explanatory variables. The

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity test shows that at 5% level of significance, the p-value is higher showing that heteroskedasticity is not significant in the model. The small value of ch-square also supports the constant variance of the error term. The result has shown that the D-statistic (2.232) appear closer to 2 depicting negative correlation. As suggested by Field (2009), values less than 1 or greater than 3 are a cause of concern. Hence, from Field's rule of thumb it can be inferred that autocorrelation is not serious.

6.6.9. Summary

This part of the study has investigated one of the key research questions: how do external factors relate to bank performance? It has set a panel regression model that comprised explanatory variables from the macroeconomic and the banking sector. It has run a regression model based on three dependent performance measures, two of which were related to profit and the rest was a price model. The selected variables have established a relationship with performance in most of the models. The result witnessed the fact that bank performance is not only determined by bank specific factors as outlined in the previous section but also by factors beyond the management control. These include the macroeconomic situations like economic growth and trade. In addition, sector related variables such as the rate of market growth and access to cost saving deposits have impact on banks performances. Therefore, the study has rejected one of the hypothesis that external factors (macroeconomic and sector) have no impact on performances.

6.7. Testing the Impact of Regulation on Performances

This section of the study explores the impact of regulation on bank performances. A regression model with explanatory variables comprising those policy measures used by the National Bank of Ethiopia (NBE) to moderate and ensure price stability, guarantee safety and soundness, establish entry barriers, determine modes of growth as well as direct a portion of banks' fund for national development objectives. The main theme of the section basically lies on testing a hypothesis arising from the research question: H_0 : Bank regulation has no impact on performances. Furthermore, there is an attempt to investigate the effect of regulatory variables on the structure and efficiency of the industry so that the level of impact of regulatory involvement is widely explored.

6.7.1. Model Construction

The hypotheses testing on the impact of regulation on performances is conducted through framing several set of regression models. The first set consists of a model that establishes a relationship between regulatory variables and bank profit and price measures. The other set of models, however, tests the link between regulatory variables and market structure and efficiency measure. The purpose of the first set of models is to test the level of impact of regulatory measures on performances. Nevertheless, the objective of the later models relies on exploring the relationship between regulatory variables with the industry structure and efficiency level of banks. Based on such framework, the models to be tested can be formulated as in shown below:

$$Per_{jt} = f(\text{regulation}, \dots) \text{ and } INS/eff_t = f(\text{regulation}, \dots) \dots \dots \dots \text{(equation 1)}$$

Where Per_{jt} represents performance measure/s for bank j during period t ; regulation are regulatory measures prevailed in the system at time t and INS/eff_t industry structure/efficiency level of the banking system at time t . The general model to be estimated is of the following linear form:

$$Per_{jt} = \beta_j + \sum \beta_k X_{jt}^k + \varepsilon_{jt} \dots \quad \varepsilon_{jt} = v_i + u_{jt} \dots \dots \dots \text{(equation 2)}$$

Where Per_{jt} is the profitability of bank j at time t , with $i = 1 \dots N$; $t = 1 \dots T$, β_j is a constant term, X_{jt} are k explanatory variables and ε_{jt} is the disturbance with v_j the unobserved regulatory effect and u_{jt} the idiosyncratic error.

More specifically, the econometric model can be expressed in mathematical form incorporating the identified variables. In order to allow for the inexact relationship among the variables as in the case of most economic time series variables error term' $\varepsilon_{i,t}$ ' is added to form equations.

Model Set I:

$$\text{Per}_{i,t} = \beta_0 + \beta_1 \text{EXC}_{i,t} + \beta_2 \text{INR}_{i,t} + \beta_3 \text{RES}_{i,t} + \beta_4 \text{ENCAP}_{i,t} + \beta_5 \text{BRG}_{i,t} + \beta_6 \text{NENT} + \beta_7 \text{BILL}_{i,t} \varepsilon_{i,t}$$

Model set II:

$$\text{CON}_{i,t} = \beta_0 + \beta_1 \text{EXC}_{i,t} + \beta_2 \text{INR}_{i,t} + \beta_3 \text{RES}_{i,t} + \beta_4 \text{ENCAP}_{i,t} + \beta_5 \text{BRG}_{i,t} + \beta_6 \text{NENT} + \beta_7 \text{BILL}_{i,t} \varepsilon_{i,t}$$

Model set III

$$\text{EFF}_{i,t} = \beta_0 + \beta_1 \text{EXC}_{i,t} + \beta_2 \text{INR}_{i,t} + \beta_3 \text{RES}_{i,t} + \beta_4 \text{ENCAP}_{i,t} + \beta_5 \text{BRG}_{i,t} + \beta_6 \text{NENT} + \beta_7 \text{BILL}_{i,t} \varepsilon_{i,t}$$

Where per incorporates RoA, ROE, NIM, dependent variables and CON- market concentration and EFF efficiency measures for both scale and managerial efficiencies.

6.7.2. Variable Definition and priori assumptions

The variables used in this part of the study are initially obtained from the various directives and circulars of the NBE. Furthermore, a careful monitoring of national policy papers related to economic growth and bank sector development were reviewed. A case in point in such regard is the Growth and Transformation Plan I & II that clearly addressed the growth mode of the economy as well as the expected contribution of banks to the development endeavor. Their recency, completeness and perceived impact are set based on the input from the interview sessions and extant literature. The definition and the expected relationship are displayed on the table below:

Table 6.25: Variables Definition for Regulatory Factors

Variables	Definition	Expected relationship
Dependent		
ROA	ability of a bank's management to generate profits from the bank's assets	
ROE	the return to shareholders on their equity	
NIM	residual of interest income resulted from efficient decision making of management	
Independent		
EXCH	Exchange rate of Birr against USD	-
INTR	The minimum interest rate set for saving and fixed time deposit	+/-
RESR	Reserve requirement as percentage of deposits	-
ENCAP	Entry Capital requirement	+/-
BRGR	Branch growth rate per annum	+/-
NWENT	Number of new entrant banks to the sector	-
BILL	Bill purchase requirement, dummy variable 0- for periods without bill requirement and exempted banks	-

Source: Author's Comutation

6.7.3. Data and Data Sources

The study aims to explore the impact of regulation on performances of individual banks operating in the industry as well as on the sector. Therefore, the data collected combines both bank level and aggregate data of the industry and macro-economy. As the objective of the study is to explore the effect of the selected regulatory factors on individual banks, a panel data set has been applied. To further explore the impact of regulation on industry related measure aggregate time series data is used. The major data sources are the various annual and quarterly publications and financial accounts of NBE, MOFED and commercial banks. Basically, the coverage is from 1999-2015 consisting of all 18 commercial banks in Ethiopia.

6.7.4. Descriptive Statistics and Trends

Ethiopia follows a managed foreign exchange regime where the Ethiopian Birr is pegged against USD by policy and the currency rate with other currencies is freely determined based on the cross currency rate with USD. The trend in exchange rate portrays a conscious policy measure that set down a gradual depreciation of Birr against USD. The mean exchange rate of USD with Birr is 13, where one

dollar is exchanged equivalently with 13 Birr. Therefore, over 1990-2015, Birr has depreciated by 1.5 times against dollar i.e. from 7.98 to 20.096.

Table 6.26: Descriptive Statistics of Regulatory Variables

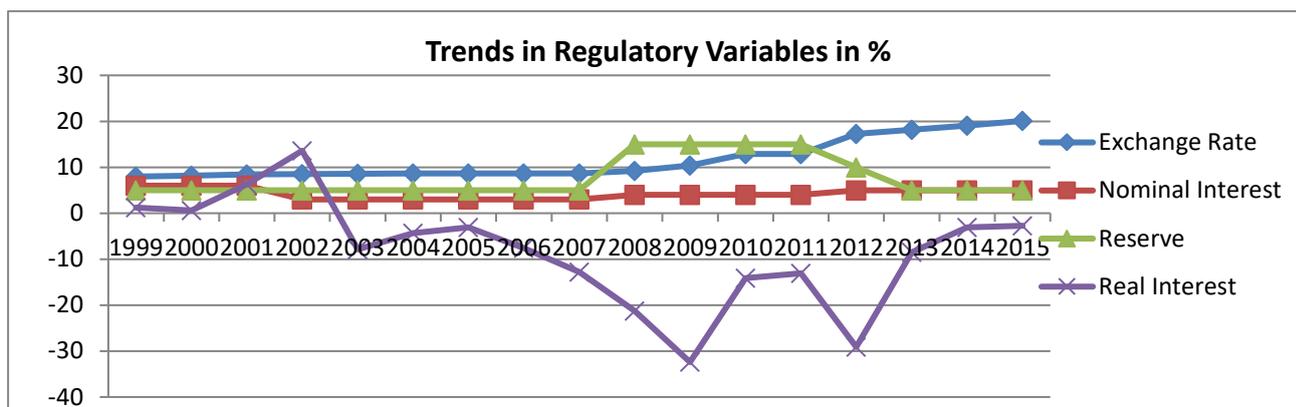
Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ROE	193	.00	90.82	18.9962	12.87965	1.697	.175	6.461	.348
ROA	193	.00	5.25	2.2333	1.10661	-.312	.175	-.252	.348
NIM	193	.00	10.16	4.5473	1.80649	.265	.175	-.055	.348
EXCH	193	7.98	20.10	13.1546	4.64224	.262	.175	-1.686	.348
INTR	193	3	6	4.45	.962	-.181	.175	-.994	.348
RESER	193	5	15	8.06	4.388	.847	.175	-1.166	.348
ENCAP	193	75	500	255.57	210.634	.306	.175	-1.926	.348
BRGR	193	3.09	42.44	18.4704	12.30466	.456	.175	-1.088	.348
NWENT	193	0	3	.73	.930	1.113	.175	.244	.348
BILL	193	0	1	.40	.492	.394	.175	-1.864	.348
Valid N (listwise)	193								

Source: Authors Computation

The Banking sector, therefore, has been operating under relatively depreciating currency regime. Nevertheless, except few periods where sudden devaluation measures were affected, the rate of currency depreciation has followed a predetermined direction and amount easing the currency management practices of banks. The currency related risk mostly affecting the income of banks usually arose from other non-USD currencies whose prices is determined based on the international currency market against USD. Therefore, banks usually prefer to hold major part of their foreign currency asset in USD that has predetermined trend and amount.

Under the current practice, the average minimum interest rate on saving and fixed time deposit is set by the National Bank of Ethiopia. Nevertheless, Banks have the liberty to set their interest rate above the minimum threshold. The lending side perhaps is liberalized to be freely set by the banks and is not subjected to regulatory interferences. The average interest rate on saving and deposit, therefore, has been around 4.4 % enjoying the freedom of infrequent change .The range of change also is not significant, hence, ensuring a stable interest rate with modest fluctuations between periods. (See chart below).

Figure 6.7: Trend in Regulatory Variables



Source: Author's Computation

Another policy measure used by the NBE to control inflation pressure as well as money circulation in the banking system is the reserve requirement. The average primary reserve requirement during the study period is around 8% with a notable variation depending on the inflation pressure. The reserve requirement historically goes to 15% of the deposit and remained above 5% in all period considered. The primary reserve is not withdrawable and attracts nil interest payments. Trend wise, the reserve requirement is mostly stable but sometimes the variation appears significant (see chart above)

The latest legal framework of the banking system was set in the Licensing and Supervisions of Banking Proclamation No. 84/1994. The proclamation seemed to have limiting conditions with regard to entry which can be considered as the main contributor for concentration of the banking services among a few banks. For example, it is clearly stated that no foreign national undertakes banking business in Ethiopia. In addition, the minimum capital required to establish a new bank was raised from Birr 10 million in 1994 to birr 75 million in 1999 to 500 million in 2011. Currently, under the Growth and transformation plan II, the banks are expected to raise their capital level to Birr 2 billion. It can be argued that although these directives and proclamations are enacted to strengthen the capacity of existing banks, they have seemingly become barrier as to why the number of operating banks did not flourish in the banking system of the country.

To elaborate this argument further, it might be necessary to look at the data on the entry of banks. For instance, from 1994 to 1999, when capital requirement was Birr 10 million, five new private banks entered to the sector. While after

2000-2007, when entry capital is increased to 75 million only two banks joined the banking system and later (after 2007) 9 banks emerge into the sector fulfilling the requirement. However, after capital lift up to Birr 500 million, no new bank has joined the system and even banks under formation has returned the fund collected from share sales. Therefore, entry into the market has not established a predetermined trend and the sector is not entertaining an average of less than 1 bank per annum.

Branch expansion has been a recent policy measure directing the growth mode of banks. Banks on average have been increasing their branch network by 18%. This remains to be closer to what has been set in the policy that demands for 25% annual increment in branch network. The industry in some years and even before the enactment of the policy has been engaged in branch expansion to ensure accessibility. Nevertheless, there have been some banks in the system which were operating under limited branch framework pursuing a substituting paradigm through technology based services and networks. The policy framework has a discouraging element towards such strategy and treats all banks to pursue a predetermined growth path not only in terms of their branch networks but also in terms of setting rates for growth ensuring parameters. Therefore, such policy framework remains to invite homogeneity in service offerings and growth approaches across the sector.

Another policy framework explained through dummy values is the Bill purchase requirement. The National Bank of Ethiopia has issued NBE bills purchase Directives since April 01, 2011 that mainly pertains to purchase of bonds, i.e. the great renaissance dam saving bond by commercial banks from NBE, which was later transferred to the Development Bank of Ethiopia, equivalent to 27% of new loan disbursement issued at a concessionary rate of three-percent (Directive No. MFA/NBEBILLS/001/2011). This directive is confronted by private banks as it is assumed to bring formidable challenges on their activities. The directive negatively affected the expansion in the loan book and hence reducing earning thereof of privately owned banks. In addition, its retroactive application and subsequent expansion of the exposure to bills is claimed to create tight liquidity position. The directive has excluded the state owned commercial bank and mostly targets the privately owned banks without discrimination in terms of size and year of stay in the business.

6.7.5. Correlations

The correlations among the independent variables are not high (less than 0.50), indicating that there might be no serious multicollinearity problems existing. Nevertheless, the relationship among most explanatory variables is significant to provide confidence that there is a genuine relationship between the variables in the model. For instance exchange rate has a significant negative relationship with interest rate and positively related with the reserve requirement. Therefore, an increase in exchange rate which increases the foreign currency proceeds in terms of Birr creates increased liquidity of the banking system; hence, the policy framework responds through increasing the reserve requirements so as to mop up the excess liquidity of the banks. In addition, the increase in liquidity also is attached with a lower interest to discourage saving in the banking system.

Table 6.27: Correlations of Regulatory Variables

		EXCH	INTR	RESER	ENCAP	BRGR	NWENT	BILL
EXCH	Pearson Correlation	1						
	Sig. (2-tailed)							
INTR	Pearson Correlation	.446**	1					
	Sig. (2-tailed)	.000						
RESER	Pearson Correlation	-.004	-.053	1				
	Sig. (2-tailed)	.956	.465					
ENCAP	Pearson Correlation	.349**	.497**	-.073	1			
	Sig. (2-tailed)	.000	.000	.310				
BRGR	Pearson Correlation	.289**	.358**	.179*	.394**	1		
	Sig. (2-tailed)	.000	.000	.013	.000			
NWENT	Pearson Correlation	-.034	.030	.522**	-.022	.183*	1	
	Sig. (2-tailed)	.439	.578	.000	.466	.011		
BILL	Pearson Correlation	.598**	.465**	-.057	.537**	.433**	-.011	1
	Sig. (2-tailed)	.000	.000	.435	.000	.000	.877	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Author's Computation (SPSS 20)

6.7.6. Empirical Results

Before running the model, the ADF panel unit root test as well as normality was done. In addition, the model results were presented based on random and fixed models as the pertinent LM and F test has rejected the poolability of the data. The

study finds that exchange rate has positive and significant relationship with the profit models. This remains to be a surprising result considering the banks' strategy of holding major portion of their foreign asset in less volatile currencies like USD. Therefore, despite the benefit, a managed currency offers to the banks in terms of insulating them from unexpected currency fluctuations arising from USD, the exposure in unpredictable fluctuating currencies like EURO has been significant to affect the profitability of banks. This is specifically much severe in cases where the USD creates a wide variation with other fluctuating currencies. Even a small exposure to fluctuating currencies could result in substantial loss that has implication on banks performance. The managed exchange regime therefore exposes banks to cross currency losses arising from those currencies whose exchange rate is determined at the international market.

Table 6.28: Regression Result for Regulatory Factors

	Model 1	Model 2	Model 3
	RoA	RoE	NIM
EXCH	.1326213 (0.0430)*	1.53837 (0.0140)*	.1481732 (0.2090)
INTR	-.0879506 (0.3130)	-2.317608 (0.0050)*	-.7.3600 (0.0961)
RESR	.010359 (0.6670)	.0515215 (0.8190)	.0394617 (0.3640)
ENCAP	.0004485 (0.0860)	-.0399372 (0.0980)	.0007845 (0.0862)
BRGR	-.0325894 (0.0121)	-.2180223 (0.0269)	-.0261922 (0.0579)
NWENT	.0555263 (0.5170)	.8196666 (0.3070)	-.1917486 (0.2050)
BILL	-.6555097 (0.0117)*	-2.63219 (0.0000)*	-.0228706 (0.0476)*
CONS	1.514032 (0.0090)*	4.174191 (0.0000)*	3.948582 (0.0200)*
Adjusted R2	38.2%	41.2%	30.2%
Walid Chi2	86.25 (0.0000)*		*
F(7,168)		45.6 (0.0000)*	45.3 (0.0000)*
F-test	4.04	7.1	2.92

	(0.0000)*	(0.0000)*	(0.0100)*
LM test	26.6	26.6	10.04
	(0.0000)*	(0.0000)*	(0.0150)*
Hausman Chi2	15.6	54.09	57.29
	(0.081)	(0.0000)*	(0.0000)*
rho(fraction of variance due to u_i)	.18600437	.50555455	.04567747

Source: Author's Computation (STATA12)

More specifically banks whose foreign exchange inflow is denominated in non-USD are prone to losses during their attempt to exchange the non-USD currency to USD. Similarly, the change in exchange rate has implication on the price measure. This implies that banks with high level of foreign currency inflow subjected to depreciating local currency could optimize their net interest margin through engaging in intermediation business using the fund created from foreign currency inflows. Nevertheless, the effect of such relationship is not statistically significant.

On the other front, the minimum rate on saving and time deposits has established a negative but statistically insignificant relationship with profit and price models. This is an expected scenario considering the negative effect of an increase deposit rate on the yield from intermediation business. The increase in cost of fund expose banks to high interest expense which narrows the net interest income affecting both profitability and net interest margin. The relationship however is not statistically significant due to the banks liberty to adjust their lending rate following the change in the cost of fund.

Another monetary stabilization policy requirement, the reserve requirement has also established a positive and insignificant relationship with both price and profit models. The direction of relationship however is unexpected in view of the downward effect of a high reserve requirement on intermediation business via holding the loanable fund of commercial banks into non interest bearing assets. Nevertheless, the National Bank of Ethiopia has mostly kept this policy variable at a constant and lower rate, 5%. This factor along with excess liquidity standing of banks as shown in the previous section analysis has not exposed banks to feel the pain from high reserve holding requirements.

There appears a mixed result in relation to the effect of entry capital on bank performance in the profit models. The rise in entry capital has a positive but statistically insignificant relationship with RoA model. This has been due to the opportunity from a capital increase in creating reliable liquidity standing for banks. With such setting, the fund collected from the market in the form of deposits can be optimally utilized to support the lending businesses that deliver positively to both asset growth and the income thereof. Sharing the aforesaid justifications, the net interest margin has established a positive and statistically insignificant relationship with entry capital requirement. Nevertheless, as shown in the previous section, capital growth has negatively and significantly related to the return from invested capital.

Another policy direction determining future growth direction of banks, growth in branch network (BRG), surprisingly resulted in negative relationship in all models. The relationship, however, is much stronger in the profit models and is statistically insignificant in the price model. The current circular from the NBE that follows the issuance of the Growth and Transformation plan of the country has placed branch expansion as an important requirement to be fulfilled by banks to ensure growth of the sector and ensure accessibility. Nevertheless, the study finds that excessive branch expansion could result in negative performances in both profitability and net interest margin. This is because branch expansion impacts the banks expense demanding for huge establishment cost and branch running costs in terms of rent and staff employment. In addition, branch opening has pressure on bank management through directing their attention towards control of large branch networks and monitor branches performances through creating good intermediation capacity and managing problem assets. Nevertheless, despite the aforesaid negative effect, the current move of the industry due to a push from the regulator has been towards expansion. This needs to be one of the policy focus area requiring amendment from the regulatory side in order to ameliorate the pressure from excessive expansion on banks profitability performances.

The number of entrants to the banking system has a positive association with bank performances. The banking industry in Ethiopia seems excessively protected not only from foreign competition but also from entry of local banks. Such regulatory framework is expected to benefit the already existing banks through lowering the level of competition in the market. Nevertheless, the

unexpected result of a better performance in times when there were large numbers of entrants into the system associates with the underdevelopment in banking system. In addition, as explained in the interview the large unbanked population that created a large demand for banking services has offered an advantage for banks to liberally expand their businesses. Nevertheless, the negative association of bank entry with price model shows that new banks have been placing pressure on the pricing mechanism of the system. The statistically insignificant relationship is the result of banks limited move to engage in price related competition. As pointed during interview, banks through their association have established a memorandum of understanding not to pursue price related competition. Such scenario is one form of collusion witnessed in the industry whose effect in fact was not severe due to their operation on a regime ensuring stable and flexible interest rate. In all models, the relationship has been statistically insignificant.

A critical policy direction to involve banks in national development endeavor, Bill purchase (BILL) has a negative and statistically significant impact on all performance models. The bill purchased by the private banking system stood more than Birr 14 billion during 2015. The amount is large and also affects the effective interest rate attached with the bill, i.e. 3% that seems lower than the minimum interest rate required to be paid for saving and fixed time deposits (5%) which is equivalent to the cost of fund of private banks (Lelissa, 2014). Therefore, banks have been lending the government with negative or nil benefit. One of the worrying issue in such regard is that exposure to bill purchase is growing at significant rate due to its base of computation on the gross new loan disbursements .This has exposed the private banking system to hold a bill balance higher than the requirement (27% of loan disbursement). The swift growth path has been diminishing the share of high earning assets of such loan to customers placing a downward pressure not only on profit but also on the yield from intermediation activity.

6.7.7. Robustness Tests

As shown in the regression result, the explanatory power of the models is much strong in profit than price models. Therefore, regulatory variables by large established a relationship with profit performance measures than price measures.

Most importantly the explanatory of the model is higher as compared to the model exploring impact of external factors such as macroeconomic and sector on performances. This shows the strong impact from regulatory actions on the banking business endeavor. The robustness tests shows that the variables in the model are normally distributed and multicollinearity problems are not severe (annex 12).

6.7.8. Summary

This part of the study has explored the impact of selected regulatory variables on performances. The variables used in the model are directly derived from the extant regulatory approach used by the Central Bank to regulate the banking business. The literature review also shows that most of them are enacted in other countries with few exceptions and mainly related to bill purchase requirements. The model constructed, therefore, has established and finds a statistical result in some of the regulatory variables with performance measures. Nevertheless, many of the variables used such as interest rate, reserve, etc. are not statistically significant to determine bank performances. The most important findings of this part of the thesis relate to the negative impact of some of the recent policy directions from the regulator on performances. For instance, branch growth and bill purchases are statistically significant with negative relationship on bank performances. This should be one of the areas requiring policy flexing from the regulatory side in the future. Nevertheless, other policy directions such as capital growth, asset quality (previous section), loan and deposit growth (previous section) remain positive contributors to performances.

6.8. Combined Model/Integrating the Quantitative Study

The quantitative study has separately investigated the impact of proxies of determinants on performances. Moreover, the constructed models used to examine their associations with performances by statistically examining their individual effect. This has helped to construct the foundation upon which several factors within and outside banking environment could make an impact. However, the combined effect of the several individual factors on performances which serves a good starting point to establish a comprehensive model of performance was not done. Actually, in this sense, the specified models used in this study may suffer from the interactions of variables from various environmental groups affecting performances. Therefore, it would be desirable to combine variables from internal and external factors in the quantitative model. The combined model, therefore, investigates the levels of interactions among the selected variables by looking at the combined effects of market structure, efficiency, bank specific, external and regulation factors.

On the other side, it was found from the qualitative study that some of the variables such as industry concentration need to be adjusted in consideration of the market structure situation of the banking sector. The one-bank concentration index (cr1), for instance, appears to be a relevant measure of industry concentration in the Ethiopian banking system considering the high market share position of the state owned bank. Therefore, the study adjusted the combined model by integrating the suggested variables in the quantitative study..

6.8.1. Integrating the Quantitative Study

A regression model combining several proxies from the market structure, market power, efficiency, bank specific factors, external factors and regulation is formulated in the following form:

$$\text{Per} = f(\text{CON}, \text{MS}, \text{EFF}, \text{BS}, \text{EF}, \text{REG})$$

Where per- relates to bank performance, MS- market share of banks, EFF- efficiency, BS- bank specific factor, EF- External Factors, REG- Regulation.

6.8.2. Correlation

As observed in the correlation coefficients of the variables under their respective models, there appears a little concern with regard to multicollinearity problem. The

variables have been reasonably correlated so as to explore a meaningful relationship with the dependent variables. Similarly, in the combined model several of the independent variables are not highly correlated (less than 0.50), indicating that there might be no serious Multicollinearity problems existing. For instance, the variables from bank specific and external environments are reasonably correlated with a correlation coefficient less than 0.8. A serious multicollinearity is observed in relation to the sector specific and regulatory variables, i.e. between market deposit growth rate and branch growth rate which is 0.8. In addition, market growth of deposit has also highly correlated (0.6) with bill purchase requirement which is a regulatory variable. One of the constraints in combining the various proxies in a model is the increase in the number of variables which might result in multicollinearity problem. Nevertheless, the study addressed the matter following two approaches. First, it has considered variables that have been significantly associated with the performance models. Therefore, the variables are distributed across the three models that are framed based on the RoA, RoE and NIM. Secondly, if the interaction among variables after being assigned in the three models is found to have a multicollinearity problem, it has been removed from the models. However, the interpretation on the relationship for the omitted variables is done based on the variable which is highly correlated with the omitted variables and integrated in the model. From the individual quantitative output, it is explored that market growth rate (MKGD) established a positive and statistically significant relationship with the profitability measures (RoA and RoE). Similarly, branch growth rate has a statistically significant relationship in the profit models. Therefore, the study has used branch growth rate in the profit model and omitted the market growth rate. The interpretation of the result related to market growth in deposit, therefore, will be based on the findings on the branch growth rate. Similarly, the bill purchase has been significantly related to all performance models. Therefore, the bill purchase will be used in the price model as the market growth and branch growth rate are not significantly related to the price models. The aforesaid strategies enable to reduce the number of variables in each models as well as the observed multicollinearity problem in the stated variables. Furthermore, after the result, the models result will be checked for multicollinearity problem following the VIF result and a robustness check on the result will be done by applying a rank regression.

6.8.3. Empirical result

The quantitative study that combined of market structure, efficiency, bank specific, external and regulatory factors had a much higher explanatory power in explaining the variations in banks' performance than working individually. Most importantly, the combination of bank specific factors appeared to better explain the variation in banks financial performance. Note that the adjusted R² increases in ROA and ROE models which is higher than the values in the model that separately used external and regulatory variables suggesting that the explanatory power has improved when adding more variables of into the model. However, the adjusted R² for bank specific variables is relatively higher than all the individual models considered. This shows that bank specific variables are among the top determinants of bank performances and, hence, better profitability performance is much more a result of the interaction with internal factors than the external and regulatory factors.

In terms of variables relationship, there was no significant change observed in the direction and level of statistical significance in most of the variables. For instance, the market structure variable is significantly and statistically negatively related to performance. Therefore, the change in the proxy variable from HHI to one-bank concentration index has resulted in similar statistical relationship with profit models. The market power proxy, the market share of banks, (MS) also related negatively with price and profit measures confirming the finding that market abuses resulting from collusive behavior appear insignificant to affect the prices paid to resources as well as the interest earned from loans. On the efficiency side, the scale efficiency of banks has a significant relationship with profitability as already observed in the separate model. The managerial efficiency measure also maintained a significant relationship with the price model witnessing the fact that price determination in the Ethiopian banking industry is much a matter of internal decision of the management than the one arising from industry structure. A similar output of the combined model also relates with the contestability of the banking sector which was attested by a coefficient in lagged profitability measure which falls between 0 and 1. Therefore, despite the high concentration level which is negatively affecting performance, there is a competitive banking environment.

Table 6.29: Regression Result for the Combined Model

	Model 1 RoA	Model 2 RoE	Model 3 NIM
LAG	.0041148 (0.0443)*	.3085769 (0.0326)*	0.42538 (0.6542)
CR1	-.0038466 (0.0000)*	-.1287213 (0.0090)*	-.0002853 (0.9560)
MSLN	.0021779 (0.0649)	-.0492583 (0.1510)	-.0064956 (0.4812)
XEFF			1.419052 (0.0365)*
SEFF	0797184 (0.0000)*	.908593 (0.0065)*	.051532 (0.0536)
OWN			0.56233 (0.0390)*
CAR	.0013483 (0.4030)	-.0036035 (0.0000)*	.06287 (0.0000)*
PRTL	-.0004482 (0.0764)	-.0167509 (0.3420)	
NIITI	.003251 (0.0090)*	.0180711 (0.0000)*	
COIN	-.0033963 (0.0100)*	-.0311904 (0.0036)*	.0018027 (0.4620)
LATD		.0017883 (0.0914)	
RGDP	.0804683 (0.0000)*	.8626149 (0.6230)	
TRDB	-3.3700 (0.0000)*	-.000218 (0.0000)*	-.9.8610 (0.0286)*
DDTD			.0203011 (0.0094)*
EXCH	.1289177 (0.0130)*	.9582538 (0.0725)	-.0874204 (0.6230)
BRGR	-.015534 (0.0168)*	-.0952181 (0.0000)*	
BILL			-.9531355 (0.0175)*
CONS	-1.177656 (0.0000)*	-9.327413 (0.0000)*	3.77213 (0.0000)*
Adjusted R2	62.8%	64.3%	41.7%
Walid Chi2		75.5 (0.0000)*	46.8 (0.000)*
F(6,168)	20.6 (0.0000)*		
F-test	4.83 (0.0000)*	10.6 (0.0000)*	2.91 (0.0000)*
LM test	36.1 (0.0000)*	28.3 (0.0000)*	14.6 (0.0000)*
Hausman Chi2	46.5 (0.0000)*	1.95 (0.834)	2.7 (0.8126)
rho(fraction of variance due to u_i)	.42628321	.55772241	.30296915

Source: Author's Computation (STATA 12)

With regard to bank specific factors, the capital adequacy ratio has maintained its relationship with bank performances as explored in the individual model. A

different result, however, relates to the insignificant impact of the asset quality parameter (PRTL) in both profit and price measures in the combined model. The variable has been significant in the RoE model when bank specific factors were used in isolation. The direction of impact, however, remained the same. The variable however has been unstable in its relationship with performances. As suggested during the interview session, asset quality, however, is a significant driver of bank performance affecting the profitability of banks. The low level of asset quality problem which is prone to strict regulation from the National Bank of Ethiopia as well as internal bank management, however, has resulted in a statistically insignificant relationship in the combined models.

Banks' ability to ensure a diversified income through business mix (NIITI) and management control on expenses (COIN) remained significant in the combined models. The direction of impact is positive in case of NIITI and negative in case of COIN. This is in line with the result from the individual models.

With regard to external variables, the growth in economy (RGDP) relates positively with both profit and price models. However, unlike the individual model, the relationship is statistically insignificant in the combined model. Despite the findings from the qualitative study and the individual model output, the relationship in the combined model appears surprising and the unstable relationship shows the less attachment of the banking sector to the performance of the economy. The direction of relationship also differs in the price model showing the fact that economic growth has positive impact on prices. The reverse side of the argument used in the individual model therefore applies to the relationship. The increase in prices relates to the findings on the pricing behavior of banks which allows banks the discretion to set their prices up or down based on the level of demand for credit and deposits. A consistent relationship among the individual and combined model is observed with regard to the trade deficit (TRDFF). A net importing country has a negative and significant impact on both profitability (RoA and RoE) and price (NIM) measures. The combined model also shows a different result with regard to the relationship of share of low cost deposit (DDTD) with prices. The variable has been omitted from the profit models. It is, however, positively related with bank price measure (NIM) and the relationship in the combined model is not statistically significant. Nevertheless, as explored during the interview, the

ability to raise cost saving deposits not only affects price but also impacts profitability of banks. One of the reasons for better efficiency of the big state owned banks, as investigated in the interview, relates to its capacity to raise cost saving deposits from the large public enterprises.

The result on the regulatory proxies, however, is consistent in terms of established relationship and level of significance. Branch growth is negatively and statically significantly related with the performance measures. The result also provides a proxy representation to the sector variable market growth rate of deposit (MKGD) which similarly will have a significant but positive relationship with performances. Similarly, the impact of exchange rate (EXCR) remained consistent to have a positive and statistical relationship with the profit models. The bill purchase (BILL) variable which is applied in the price model has a significant and negative impact on price performance. The result is similar to the findings in the individual model and is omitted in the profit model due to its high correlation with branch growth rate (BRG). The branch growth rate has indeed established a significant and statically negative relationship in the profit model. Therefore, as a representation, the bill purchase has similar statistically significant relationship with profit performances as it was witnessed in the individual models.

Overall, the result of the combined model has been consistent with the individual models as used in the previous section with minor stability issues related to some proxy variables. For instance, the asset quality (PRTL), economy growth (RGDP) and share of cost saving deposits (DDTD) was unstable in the combined and individual model. In all the variables however the instability relates to the change in the level of significance than the direction of impact. Therefore, in such cases the result from the qualitative study is used to improve the quantitative findings.

Furthermore, in order to further test the robustness of the estimated results, rank regression technique is applied. This because the rank regression is relatively less sensitive to extreme values than the panel regression as it is based on ranks rather than value of the proxy variables. Therefore, consistent results from the rank and value based models provides robustness to the findings. Therefore, the combined models based on RoA, RoE and NIM Models are re-estimated by running the rank-based regressions. A comparison on the result shows that in the

rank-based regression model, the signs of the coefficients on explanatory variables appear the same. In addition, the coefficients in most of the variables were significant in indicating that estimated association between proxy variables and performances tends to be robust. A few exceptions, however, relates to the relationship of the asset quality which is now appear significant while using the rank correlation coefficient. Therefore, the instability in the variable associates with the effect of extreme values associated to the variation in the nonperforming asset holdings of banks in the industry. Similarly, the share of cost saving deposit in the total deposit appears significant in the rank correlation but economic growth remains insignificant in the rank based regression.

Overall, the estimated results in the individual models, the combined model and rank based models are more or less consistent to establish a relationship among market structure, bank specific, efficiency, external and regulatory factors. Some of the identified variation are a result of the effect from extreme values due to the variation in problem asset holdings and cost saving deposits among small and big banks. In addition, the difference in association between economic growth and performance goes to a reason beyond variation in economic growth rate. The study therefore sticks to the qualitative study findings that provided reasonable justification on the significant impact of economic growth on performances. As observed in the literature review, the direction and significance of relationship between economic growth and bank performance is positive and statistically significant. Even if the quantitative study remains unstable, the qualitative study explored a result in line with the literature review as set in the a priori assumption and as it's found in the individual model.

6.8.4. Summary

The quantitative model has brought the various individual models together to examine the impact of internal and external factors on bank performances. The result in most of the variables appears consistent with the individual models but in some of the variables it remained unstable. Most of the variables in the model retains statistical significance and established a relationship with the performance measures. Turning to the regressions of bank performance on the combination

metrics, the combined model turns to have an improved explanatory power as compared to the individual models. Nevertheless, a model on bank specific factors has got more explanatory power. In addition, when using the RoA model, the explanatory power of the individual and combined models increases as compared to the RoE and NIM models. Specifically, the price model has the lowest explanatory power and relates insignificantly most of the variables in the models. In sum, the results further confirm that bank specific factors explain a larger proportion of the variation in banks' financial performance and their effect is stronger in the RoA model. This proves the usually stated literature identifying RoA as the most useful and powerful measure explaining performance of banks. This is behind the arguments that profit oriented measures are more influential indicators of bank performance than price measures.

CHAPTER SEVEN

QUALITATIVE RESEARCH RESULT

7.1. Introduction

The previous chapter reported the empirical findings from the quantitative component of this thesis. This part of the study gives an overview of the qualitative analysis of 18 interviews that were conducted with participants of bank managers and regulatory staff. The interview is conducted with managers of 7 commercial banks and 4 Central Bank staff. Of the commercial banks, one is from a state owned bank and the remaining six are from private owned banks. The representation for state owned commercial banks is 100% as the recent merger decision from the government has amalgamated the two stated owned banks. As discussed in the methodology section, the private banks were taken following a purposive sampling approach and in a way to represent both middle and recent entrant banks. The duration of interviews ranged from 45 minutes to an hour, and interviews were conducted at a place convenient for the participant (mostly at their offices and few are conducted by phone). The main topic of the interview was the participant's experience related to the banking industry structure and performance situation. The topic was supported by open-ended questions dealing with different issues related to bank conduct, bank specific, external and regulatory factors (interview guide and profile of interviewees is annexed). Prior to the interview, the participants voluntarily signed informed consent which was submitted to UNISA's ethic review committee. A qualitative content analysis consisting of counting and comparing quotations, keywords, or paragraphs followed by the interpretation of the underlying context is used to drive a meaningful explanation on the subjects discussed. A direct quotation of some of the interviewees' opinion is presented between the analyses.

This chapter discusses the results that were generated from the qualitative part of this thesis in which the following specific research questions were explored: given the existing structure, how are banks behaving? This is intended to examine the behavior /conduct of banks taking into account the structural and regulatory framework in the system. Furthermore, the qualitative interview analysis is aimed to:

- illustrate and complement the results of the statistical analyses with respect to the impact of market structure, conduct, regulation, bank specific factors, external (macroeconomic and industry) and efficiency on performances;
- explore the extent to which bank performances depend on the above mentioned variables, as expressed by interviewees based on their experiences;
- find out whether, and if so how, participants think about the possible reasons as to the direction and level of impact of the exploratory variables on performances; and
- identify the banks' conduct under the prevailing structure and regulatory framework and explore possible connections between the explanatory variables and the way in which they inter-relate each other.

To answer these questions, the study analyzed the participants' views in each pertinent question. The study aims to find out how bank performance is affected by the variables identified in the quantitative part of the study and how the managers and experts do assess this. Most importantly, the interview has taken in to consideration all surprises from the quantitative study aiming to find out how the banking experts explain or justify the findings. This approach allows drawing conclusions with regard to the possible effects of the explanatory variables on performances based on participants' reports.

In the context of the qualitative research, the study operationalizes '*performance*' as effects and changes for the better in market structure, conduct, efficiency, regulation and bank and industry factors. Below these domains, the study addresses the performance categories that have been developed in the theoretical parts of the study and applied in the quantitative part of the analysis. Through this, the qualitative part of the study also helps to identify research questions for further research investigation. Additionally, by combining findings from the quantitative and qualitative approaches, a comprehensive model to investigate bank performances is explored in the next chapter in relation to bank performance modeling and measurement.

7.2. Market Structure

7.2.1. Understanding Market Structure, Market Power and Contestability

At the beginning of each interview session, the researcher introduced briefly the area of interest and the definition of each interview session from the perspective of academic research. It is found that many bank managers and regulatory staff have a similar interpretation regarding the concept of industry structure. They have defined industry structure from the context of both the size and number of firms operating in the market. For example:

'Industry/market structure represents the difference in the size of banks operating in the market....'(Interview BM4).

'Industry /market structure tends to define the number of banks in the system. An industry with large number of firms tends towards ensuring a diversified market distribution....' (Interview BM10).

On the other hand, the interviewed bank regulatory staff tended to be considerate to the ideas associated with the term market structure and explained market structure from a broader concept, including not only the firm size and number, but also other items. For instance bank manager BM 6 defined it as:

'I think market structure includes bank number, but also relates to the market share of banks, the entry and exit mode in the industry, the similarity across banks in the system in terms of product and service offerings etc.' (Interview BM6).

There is also an attempt to define market structure from the side of level of competition in the system by both bank managers and regulatory staff:

'Market structure to me is a result of the degree of competition reign the system. In other words, a competitive market has a diversified industry distribution than a lesser competitive market....' (Interview RS4 and BM7).

Overall, it is found that managers and regulatory staff are generally familiar with the ideas associated with the concept of industry structure. However, the views from bank managers tend to be narrow as many of them have focused on the size and numbers rather than the broad concept of industry structure.

7.2.2. Measurements and Proxy Variables

In order to explore the approach followed to measure the market /industry structure, a specific interview question that reads, ‘how do you measure the structure of the industry?’, is designed to explore managers’ and regulatory staff views on it. The interview responses showed that the managers tended to pay more attention to market share (as the share of banks in the loan and deposit market) in measuring the level of industry concentration. For example, bank manager BM8 noted that:

‘We tend to measure the industry structure through market share of banks and the purpose of doing it mainly targets the elements in which they had relative strengths compared with peers, but at the same time emphasized the importance of monitoring growth of banks in the system...’(Interview BM8).

Much similar approach has been followed by the regulators. As explained during the interview; the industry concentration tends to be measured through market share of banks. Nevertheless, the regulatory staff explained that they consider the industry share across three tiers of peer groupings: state-owned, private middle size and small private banks. In addition, they indicated that the regulator tends to follow the market share of the biggest commercial bank, the CBE, to explore the market concentration of the industry:

‘The regulatory organ classifies banks in the system into three peers consisting of state owned banks, middle size private banks, and small private banks. The base of classification mainly relies on the NBE’s rule attached with the asset size of banks. The growth in market share across the peer groups is periodically followed and compared to be used for bank ratings across various parameters. In addition, we also take in to consideration the market share of the Commercial Bank of Ethiopia during our industry related assessments...’ (Interview RS2).

The above explanations show that market share of banks has remained an important variable reflecting the market structure of the industry. The banks have been using mainly the market share of their groupings, as set by the NBE, along with the market growth measures in order to find the industry concentration level and their position in the market. This has been consistent with the market power

hypotheses view of the market structure theory as has been discussed in the literature review part of the study.

The evidence presented here shows that apart from relying on market share that the regulatory institution has developed, a framework that measures the industry concentration level through considering the market share of the big bank is used. This coincides with our theoretical literature framework to measure industry concentration using k-bank ratio. The regulatory monitors a one bank (CR1) concentration index to monitor the level of concentration of the industry. The result does not appear surprising in consideration of the large difference in the market share between the big bank and other banks in the system. Therefore, any threat from market concentration on performance mainly associates with the change in the market share of the Commercial Bank of Ethiopia than from anywhere else. The quantitative part of this study initially has used the HHI and CR3 as proxy variable to measure market structure. In subsequent sections, the finding from the quantitative part of the study is adjusted to use the share of a big bank (CR1) to observe if there is any change in the result of the quantitative findings. The result, however, is not changed and concentration remained negatively associated to performances. Nevertheless, the use of market share by each bank is consistent with our attempt to measure market concentration applying HHI as it provides consideration for the market share of each bank operating in the sector.

The interview question is further extended to find out which of the market related variables were used to monitor the concentration level of the industry through setting a question that runs, 'in which of bank performance measures is the market share computed?'

As explained by the bank managers, the study finds that market share computation applies separately for the deposit and loan performances. For instance:

'We have been computing market share at loan and deposit market so as to observe the trend in the market share of banks. This has been reported in the quarter financial performance reports of banks.' (Interview BM9).

'The data for market share computation is collected through an informal implicit agreement of data sharing among the banks themselves. In addition, we gather data related to profitability performances using gross profit. However, the informal channel

much is used by private than state owned banks as state owned banks are not willing to offer data.’ (Interview BM14).

Nevertheless, in addition to the stated variables, the regulatory institution also uses additional data related to branch network and capital share to compute the market share status of banks in the system in general and more specifically of the big state owned bank. For example:

‘The regulatory organ has created an information gathering platform through establishing a directive for the purpose (Manner of reporting financial information). Therefore, banks are required to supply financial and non-financial information within a specified interval. Failure to submit on stated deadline and format will result in penalty. The regulatory organ holds a central database on bank financial reports and computes market share in terms of loans, deposit, branch network and capital.’ (Interview RS2).

The study therefore points that although managers highlighted the importance of monitoring market share of banks in the system, the effort has been constrained by the lack of a common explicit data sharing platform in the industry. Banks are using an informal channel to collect bank specific data and aggregate it to show the progress in the industry and their market position in the system. Such approach also has been challenged due to the absence of records of state owned banks which are much conservative on data sharing.

The regulatory organ, thanks to its enforcement power, however, has no problem of acquiring data from the system. This has enabled to incorporate more diverse variables than the banking system to monitor market share of banks. Therefore, the commonly used variables to compute market share and market concentration are loans and deposits with some additions from the regulatory side such as capital and branch network. The quantitative study has used the market concentration situation in both markets. Therefore, the approach followed in the study is much consistent with the approach of the banks. The other variables branch and capital, have also been used in the study as explanatory variables to proxy different factors related to bank and industry situations.

7.2.3. Impact of Market Structure on Performances

Surprisingly, the quantitative empirical study that investigates the impact of market structure on performances shows a negative and statistically negative

relationship. When the researcher asked the perceptions of the interviewees (bank managers) regarding the result of the study and the interpretation thereof, almost all the interviewees, private bank managers, agreed on the result. However, there is a different opinion arising from the state owned bank managers and regulatory staff concerning the sign of the relationship. For example, the private banks managers stated that:

'The industry structure has led a competition environment among unequals. When I say this is not only about size but is also about access to market. The state owned banks are benefiting from a large public enterprise market which exclusively is working with the CBE. This is not only enabled the bank to provide large loan to the public sector but also allowed to mobilize significant sum of deposits at zero cost.'(Interview BM11).

'The Commercial Bank of Ethiopia has got an exclusive benefit on the export to China. This has been set by regulation and the private banks have nil share of the forex earning from the market.'(Interview BM3).

'The capacity of the big state owned banks has been large to provide a big sum of credit to a single borrower. This has been determined based on the capital level of banks. Similarly, foreign currency holding capacity of the bank obviously is large considering the large capital position of the Bank. Not only about size of capital but the bank also is enjoying the comfort to raise its capital level, which is decided by the government. This is unlike to the private banking system which is struggling to raise its capital level from the market issuing shares.'(Interview BM9).

'I don't believe that the structure has enabled the banking industry to remain competitive. This is as a result of the lack of liberty to engage in key competitive variables like introduction of technologies. There is a pervasive fear across the private banking system to engage in technology introduction due to CBE's high capital position that allows it to easily acquire technologies. Therefore, we prefer to compete on other areas through snatching customers rather than killing ourselves through competing in areas limiting our capacity. This obviously affects the level of competition and efficiency in the system.' (Interview BM6).

The private banking system, therefore, trusts that the current industry structure remained a barrier towards performance improvement:

- Constraining banking competition through inviting excessive involvement of the government in the Ethiopian banking system and ensuring lack of a level playing field among the banks;
- Limiting the growth of the private banking system in core operational areas like deposit mobilization, forex and credit disbursements restricting the private banking system access to the public enterprise and forex earning resources (such as export earnings from goods destined to China);
- Contributing to bank inefficiency via narrowing the share of the private banks in cost saving deposits like demand deposits;
- Benefiting the CBE that has high capital level than the private banks which benefited the Bank to enjoy large credit extension to single borrower and foreign currency holdings;
- Boosting the competition level among the private banks on limited market;
- Leading to less level of private capital accumulation than the expected as state owned banks are lifting their capital at ease by government decisions than the usual norm of raising capital though offering shares to the public;
- Resulting in the limited infrastructural development (such as IT) in the banking sector. CBE as a pace setter having a large capital to acquire new technologies has not been playing its role. In addition, other banks have the fear to involve in new technology introduction which is believed to be catastrophic in times of similar response by the big banks. This will be self defeating to banks taking in to account the high potential of the CBE to invest in technology acquisition.

The views of the regulator and the state owned bank managers, however, is a bit different. Nevertheless, the explanation provided doesn't deny the relationship, but intended to provide different perspectives to look at the prevailing market structure and dominance from the state owned banks in the system.

'Our large share in the market has contributed positively to the stability of the banking system. You can imagine how aggressive the CBE would be had it has been owned by private share holders. Through our existence in the market for long periods, our contribution also extends to building a banking culture.'
(Interview BM14).

'Our large branch network in the regions, where private banks have neglected, has brought the unbanked population to benefit from our banking services. The private banks have been chasing the rich and are contributing for the wide income inequality. However, we are helping the poor and neglected part of the society to get access to banking services. In such endeavor, we are pursuing a responsible banking approach than any of the private banks.' (Interview BM13).

'The commercial bank of Ethiopia has been offering positively in building banking culture in our society. One of the regulatory and government objectives is to aware the society about banking services. This has been successfully done by the CBE.'(Interview RS1).

The argument from public bank managers and regulatory staff shows that the large share of state owned banks has:

- led to enhanced financial stability through easing bank supervision and close monitoring of performances by the government;
- contributed positively in building banking culture to the wider part of the society through establishing a banking awareness program;
- manifested fair distribution of banking services in the country. Private Banks are focusing on customer base situated around big cities and mainly of the Addis market. Other non-profitable areas could remain neglected had the CBE was not played a key role in accessing the regions by opening large branch outlet;
- ensured better socially responsible banking service to reign in the system via offering banking services to the wider community;

As it can be observed from the above justifications, the finding from the quantitative analysis has a meaningful result. The existing state dominated market structure is negatively impacting performance of the banks and this has been well felt by the bank managers. Nevertheless, the structure has got support from the public managers and regulatory staff as it ensures to fulfill motives beyond financial success. The financial determinants like profitability however are consistently justified by both qualitative and quantitative result to negatively affected by industry concentration.

7.2.4. Bank Competition and Contestability

As observed from the quantitative study, the coefficient of the lagged variable for both RoA and RoE is between 0 and 1 suggesting the persistence of profit and modest competitiveness of the sector. The result remains to be a surprise considering the high market concentration situation in the Ethiopian banking industry. As suggested in the SCP model, a high market concentration is a sign of low level of competitiveness. Nevertheless, the banking system in Ethiopia is found to be modestly competitive. The qualitative study has brought the result to be discussed with the bank managers and regulatory staff based on the following question: 'how competitive is the banking system?'

'I can say that there is a growing competitive spirit in the private banking system. Private banks compete in resource mobilization effort mainly through expanding their branch networks.' (Interview RS4).

'If we trust that there is a competition in the banking system that must be among the private banks. They compete on deposit mobilization, forex earnings, branches, etc. State vs private bank competition however is unthinkable due the difference in size and capacity.'(Interview BM6).

'We (private banks) compete on several issues like forex, corporate customers, exporters and non business aspects like staff, innovation and promotion etc. We monitor the move of private banks mainly of our peers; hence the big banks are not in our competitive arena.'(Interview BM10).

Several of the responses show that there is a growing competition in the Ethiopian banking system in several areas such as deposit mobilization, foreign currency collection, branch, innovation, staff, promotion, snatching big corporate customers and exporters. However, the competitive move is mainly among the private banks themselves and the state bank remains out of the domain due to its larger size and capacity. The section related to bank conduct shows which of the above mentioned competitive areas describe the conduct of banks and reveals the intensity of the competition across banks in the industry.

7.3. Efficiency Determinants and Impact of Efficiency on Performances

The DEA approach employed has used a combination of three inputs and two outputs to determine the scale and managerial efficiency of banks. In the process, it has developed a score for each components of efficiency and analyzed their level and variation at bank and industry positions. It has used the peer classification of NBE along with the difference in ownership to explore whether there is a variation in efficiency among Ethiopian banks. Furthermore, the scores of efficiency along with industry concentration measures were used in the quantitative model that determines the impact of market structure on performances. The study has found that efficiency and more specifically of scale efficiency is a core determinant of bank performances. The result tends to support the efficient market hypothesis theory and rejects the traditional structure-conduct-performance theory. Efficiency variables were also used in the investigation of the quiet life hypothesis as dependent variables and the result explored that there is no a quiet life situation in the banking system. The study further extends the exploration with regard to efficiency by investigating factors that determine the level of efficiency in the Ethiopian banking system through the use of regression. The regression finds that deposit growth, loan and earning asset share from total asset are important determinants of efficiency while branch size and fixed asset growth are not significantly related to efficiency. The qualitative part of this study further explores the reason for the established relationship as well as the suitability of the input and output used, the approach followed, the use of DEA as efficiency measure as well as the stated and other variables that most likely determine the efficiency of banks.

7.3.1. Intermediation Approach

The intermediation approach considers banks as primarily intermediating funds between savers and investors. The other alternative approach, the production approach, considers banks as firms, which employ capital and labour to produce different types of deposit and loan accounts. The quantitative study has selected the intermediation approach as it appears more appropriate for evaluating entire banks and is superior for evaluating the importance of frontier efficiency to the profitability of the bank, since minimization of total costs, not just production costs is needed to maximize profits. With such background, the qualitative study has

brought the matter to be discussed by the bank managers and regulatory staff. The result shows that the intermediation approach is the pertinent method to determine efficiency of banks: For example:

'I consider banks as institutions which are trading money. They collect excess saving of the depositors and lend it to the needy borrowers. In the process they make money. Therefore, intermediation is an obvious engagement of banks.' (Interview BM14).

'Banks are playing an intermediary role between savers and borrowers. They fill the gap in finance by mobilizing resources from surplus sources and lending it to wherever there is shortage.'(Interview BM 7).

'I think the payment and other services of banks are intended to support the resource mobilization endeavor. They are not aimed to be the heart of earning sources of banks and are not the core of the business.'(Interview RS3).

'Unlike other firms banks are highly leveraged firms which are operating through the funds from depositors rather than the fund from their owners. Therefore, in order to grow and sustain profitable they need to mobilize more resources like deposit and convert it to earning assets like credit.'(Interview BM1).

The explanation of the banking experts shows that banks by large are engaged in the intermediation activity by mobilizing resources from scarce sources and lending to wherever there is shortage. Furthermore, taking capital and labor as input as suggested in the production approach is not workable in the banking business because bank growth and profitability are much more the result of the resources mobilized rather than the invested capital amount. Therefore, the interview discussion confirms the approach selected in the quantitative study is reliable and is coherent with the business engagement of the banking sector.

7.3.2. Input-output Selection

After a consensus on the approach to follow, there will be an obvious guide in the selection of input and output to be used in the DEA model. At least deposit, which is found at the core of the banking business, remains a major input factor applied to produce credits to the needy borrowers. Nevertheless, the intangible nature of bank input and output creates confusion as to certainly determine the multi input-multi output of the business. The quantitative study used bank deposit, branch

size and fixed asset with their associated prices as input. Furthermore, loan and other earning assets are taken as output produced from the abovementioned input usage. The researcher has discussed with the interviewees to forward their views on the input-output choice of the quantitative study. The result by large is consistent with the input-output selection in the study with some variations related to input choice. For example:

'Bank deposits are the major input of banks in their credit activities. Nevertheless, bank deposits in terms of foreign currencies are also important input sources spearheading the foreign banking operations.' (Interview BM2).

'I believe that deposits, staff size, branch and fixed assets are the inputs used by banks. Their corresponding output relates to the two core earning sources like credit and foreign banking operation.'(Interview BM9).

'I think bank branches, ATM networks; employees are major inputs of the business. The output consists of loans and advances and deposits at other banks. You may consider off-balance sheet activities like L/Cs, guarantees etc as output of banking services.'(Interview RS2).

'I guess banking as knowledge business has the talent of its management and employees at the forefront to produce deposits, loans, and international banking businesses.'(Interview BM14).

As observed in the responses, several of inputs and outputs were forwarded during the interview. On the input side, deposits, staff size, branch, fixed assets, ATM networks, and management and employees talent were identified. Similarly, credit, foreign banking, deposit with other banks and off balance sheet activities are identified as output of the banking business. In addition, there is a suggestion from some managers to use deposits in the output side. After noting the suggestions, the researcher decided to rely on the input-output identified in the quantitative study because:

- the use of the number of branches and employees together can result in dual input usage. The researcher has noted that the number of employees at banks vary in accordance with their number of branches (correlation coefficient of 98%). That means banks with large branch network obviously

employee more staff to fill the manpower demands of their branches than banks with limited number of branches. The quantitative study therefore uses branch number instead of number of employees as input representing both branch and staffing size.

- the use of ATM networks as input also will have similar effect as in the above. Banks with ATM networks will hold the value of their ATMs in their fixed assets records.
- the study also finds that it will be difficult to exactly measure and quantitatively determine the management and employees talent. This is because of the qualitative nature of the input as well as due to the absence of a yardstick to represent the management and employees talent.
- on the output side, several of the indicated outputs are incorporated in the quantitative study. For instance, the foreign currency reserve and deposits at other commercial banks which are attached with interest rate are included in the other earning asset components. The study however has not included some of the off balance sheet activities of banks like guarantees as the data is not available. In addition, some of them like L/Cs which is entertained based on the foreign currency reserve of banks are partially covered by representing them in the on balance sheet accounts like foreign deposits.
- the input price is framed based on the selected inputs and hence much variation will not be observed as long as there is an agreement on the type of inputs variables.

7.3.3. Use of Data Envelopment Analysis (DEA) Model

As stated in the literature review, regardless of the financial ratios, there are two approaches to measure efficiency of banks: parametric and non-parametric. The stochastic frontier and the Data Envelopment Analysis are the two widely used variants. The quantitative study has used the DEA approach. The use of DEA in developing economies is a lot lesser than the advanced economies (Nigmonov, 2010). However, as suggested by Berg (2010), DEA offers several advantages, for instance, it works relatively well with small samples. It is proven to be useful in

uncovering relationships that remain hidden for other methodologies. It is able to handle multiple inputs and outputs. It is also capable of being used with any input-output measurement etc. With such background, the bank managers and regulatory staff are requested to indicate which of the models is used by them to measure efficiency of their banks /branches and other banks in the industry. The responses are a bit different from the expectations as both bank managers and regulatory staff have not applied any of the methods to measure efficiencies. They usually apply a simple ratio based assessment to look for their efficiency level. For example:

'We rely on the commonly used ratios to assess bank efficiencies. For instance, the cost to income ratio helps us to look for the usage of resources to produce a certain level of earning...' (Interview RS1).

'Our bank traces each component of expenses and revenues and analyzes their share from their total. In addition, we observe the change through establishing trends.' (Interview BM9).

'We don't apply either of the methods (Stochastic frontier or Data Envelopment analysis). We observe whether we have a lean operation or not through applying simple ratios like cost to income, which we compute it on aggregate basis and for operational expense and operational income components. We usually will not focus on the interest expense aspect and prefer the cost to income ratio associated to operations as the interest expense is covered by its counter interest income.' (Interview BM8).

'We usually trace our efficiency based on our ability to raise cost efficiency resources. In such regard the cost of fund, which is a ratio of interest expense and average deposit, appears to be a strong indicator. We compare our cost of fund with other banks and make sure whether we are mobilizing cost effective deposits.'(Interview BM12).

As pointed out above, the industry commonly applies simple financial ratios to monitor efficiency. There is a good practice of comparing with both trend and other banks. Nevertheless, efficiency measures that use multi-input and multi-output are not implemented in the Ethiopian banking system. As observed in the literature, DEA differs from a simple efficiency ratio in that it accommodates

multiple inputs and outputs and provides significant additional information about where efficiency improvements can be achieved (Cooper, et. al., 2000). In addition, Berger (2009) suggested that ratio analyses do not control individual bank outputs, input prices, or other exogenous factors facing banks in the way that studies using modern efficiency methodology do, and so may give misleading results. Furthermore, the African Development Bank report (2011) admitted that the same drawbacks on the use of ratio based measures and has recommended for managers of banks and policy makers to search alternative tools (such as DEA) that compensate for the drawbacks in financial ratio analysis. This study, therefore, contributes to the introduction in the application of one of the efficiency measures, the Data Envelopment Analysis (DEA), to the Ethiopian banking system. In this regard, it introduces how the input selection is done, the approach to be used, how the output will be analyzed and interpreted and how it can be used to benchmark and point out areas of improvement.

7.3.4. Efficiency Variation

After a discussion on the approach followed, the model used and input-output selection, we have continued the discussion with bank managers and regulatory staff on the result of the quantitative study. In this regard, a discussion related to the efficiency level, variation across various bank groupings and the determinant factors were made with the aim of exploring further justifications to the result. One of the results in efficiency variation relates to the surprise result to find the state owned banks consistently at the top of the efficiency score. They have forwarded various helpful justifications for the variation. For example:

'I think it will not be a surprise to see the state owned banks as more efficient than the private banks. Thanks to the command economy system, the state owned banks are the only banks operating in the industry for long periods. They have reasonable years of experience in the banking system to mobilize and manage large resources.'(Interview BM5).

'Yes, they might be efficient because they are privileged to be the sole beneficiary of the public enterprise market that allowed them to mobilize large resources at lower cost.' (Interview BM6).

'Being a state owned bank has provided them the benefit of an implicit public trust. They are the public preferred banks due to their ownership structure. People did not trust us because we are not owned by the government.'(Interview BM3).

'Being the sole beneficiary of the export proceeds from China export, the CBE is enjoying sizable amount of foreign currency earnings. In addition, it has got large base of resources from state enterprise along with lending possibilities to the large public commercial firms.' (Interview BM6).

'Regulation has not created a level playing field among private and state owned banks. State owned banks like CBE are exempted from bill purchase and sometimes also got support from the state in the form of foreign currency availability.'(Interview BM9).

The explanation from the interview has shown that the high and consistent efficiency score of the state owned banks are associated with their long time experience in the banking business. Furthermore, a privilege that creates a sole possession of some banking markets like public enterprise and foreign currency proceeds from China export are also cited as reasons for the top efficiency score. Besides, the regulation has also been discriminatory in some cases like bill purchases. As a state child, they have also been supported by the government in the form of ensuring foreign currency availability and enjoying implicit guarantee to cultivate public trust at ease. The above factors could obviously have positive implication on the mobilization of local and foreign currency dominated resources and deployment of the resources to a dedicated large market without regulatory restrictions. Nevertheless, there has been a different view from the CBE managers and regulatory staff concerning the efficiency sources and regulation. For example:

'We trust that there is a level playing field in the banking system as there is no explicit restriction for public enterprises not transact with the private banks. The reason we excel to attract them is that we have a large lending capacity to meet their credit demands. In addition, we offer them foreign currencies for their imports. That obviously is not the interest of the private banking system.'(Interview BM14).

'The regulatory framework is consistent for all commercial banks in the industry. There is no separate directive issued to distinctly serve the CBE. The exemption in bill purchase is due to the high stock of government bill holdings by the CBE.'(Interview RS4).

'We are efficient because we are accessible to the public through our large branch networks. In addition, we offer quality of services, lead the industry in technology usage and successfully promote our bank. The increase in our deposit base is not a result of public enterprises but is from the private customer base and mainly the customer base neglected by the private banks.'(Interview BM13).

As observed above, there is a different view from the state bank managers and regulatory staff concerning regulation and market reaches of banks. Even if the public enterprise sector prefers to work with the state bank, there appear no official restrictions to ban the private banking system to deal with the state owned enterprises. Nevertheless, there seems an implicit harmony among the state bank and state owned companies to deal banking transactions through the CBE. As pointed above, this to some extent is the result of the difference in size of banks, which has created a variation among banks in terms of their lending capacity. For instance, the CBE thanks to its large capital base, can extend large sum of loans to big public institutions which will be difficult to other private banks unless they form a syndication to meet the credit demand of public enterprises. In addition, the CBE due its large size, has developed a capacity to adopt new technologies, create accessibility through opening branches and bear the promotion cost without placing a significant impact on its operational expenses. Nevertheless, observed regulatory exceptions mostly relate to bill purchase which has emerged due to CBE's large exposure to other form of government bills like corporate bonds and treasury bills etc. Such justifications, however, have implications on the competition in the sector. On one side, the bill purchase requirement for CBE and other private banks have a different nature. For instance, CBE has been purchasing government bills considering its liquidity status and the requirement is not attached to the development in its lending business. Whereas the bill purchase is a compulsory requirement for the private banking system which is done irrespective of the liquidity status and is based on the level of credit disbursement. On the other hand, the bill purchase has a forward looking aspect for the private banking system but remained to have a backward effect on the

CBE. Therefore, the current and forthcoming performances of the CBE appear not to be affected by the requirements. Nevertheless, from the quantitative study it is explored that the bank remained more efficient than the private banks even before the period the bill is introduced. Hence, other factors like bank size which allowed the bank to get benefit from large markets such as public enterprises, banking experiences, support from the government as a state child and public trust can remain good justifications for the variation in efficiency. Nevertheless, the difference in efficiency among state and privately owned banks brought due to the regulation discrimination related to bill purchase remains to be a subject left for further research.

7.3.5. Determinants of Efficiency

As the DEA is parametric approach which is not subjected to statistical testing procedure, the quantitative study has used a regression model to explore further the efficiency determinants in the banking system. It has used variables used as input and output in the DEA model to test which of the input/output variables are significant drivers of bank efficiency. The quantitative study used the efficiency scores of DEA as dependent variable and the selected inputs/outputs as explanatory factors. It finds that deposit growth rate, loan size and earning asset growth as important drivers of efficiency. Nevertheless, branch size and fixed asset growth remain insignificantly related to efficiency scores. This result of the study has also been discussed during the interview with bank managers and regulatory staff aiming to get their view on it. For example:

'I think deposit mobilization especially of those cost saving are obviously remain to be the sources of efficiency as they appear to have double edge effect to manage interest expense on the one side and boost the earning from the intermediation business on the other.' (Interview BM10).

'Growth in earning assets and loans will also contribute positively to efficiency as they are major sources of earnings. Hence, large exposure in such assets will increase your earning level ensuring efficiency.'(Interview RS2).

'Banking as knowledge business has less fixed asset holdings. The assets we have are our employees. Therefore, the efficiency sources are a result of the

capacity to mobilize deposits and manage to extend comparable loans keeping the asset quality at good level.’ (Interview BM13).

As indicated above, the qualitative study obtained reliable justifications related to the efficiency sources. Banks’ ability to mobilize large resources, capacity to boost loan book size, maintain asset quality and diversify income sources through building other earning asset bases appear supportable endeavors to enhance the efficiency of the banks by both bank managers and regulators.

7.4. Bank Conduct

As defined in the literature review section, conduct involves the behavior (actions) of the firms in a market (Mohamed, 2013) and focuses on how firms set prices, whether independently or in collusion with other firms in the market and on how firms decide on their advertising and research budgets, and how much expenditure is devoted to these activities (Ferguson, 1994). Conduct also takes into consideration the product/services strategies of the firms within an industry, promotion, differentiation, mergers, etc. (Grigorova, 2008). These aspects of conduct are influenced by the structure of the market since the firm’s activities are based on the environment it is in to be successful (Ibid.).

After observing the result from the quantitative study result of a negative significant statistical relationship between market structure and performances, it remains essential to assess how banks in the system are responding to the existing structure to be successful in their operation. The aim of the study is to find whether banks’ responses are in line with the theoretical argument to determine bank conduct from market structure. In addition, it sets out specific factors beyond market structure determining the conduct of banks in the system. The quantitative results can even suggest for some of behaviors, however, they have weakness to provide a comprehensive coverage to selected conduct determinants. In addition, as a major critic to the SCP hypothesis, the linkage between structure and conduct remained uncertain and the direction of causality is also problematic. Therefore, a total reliance on the quantitative study to determine conduct will obviously bias the result and cannot provide a holistic approach to find out the behavior of banks. This is due to the fact that some of the variables like strategies are not quantitative in nature and even if they are, they cannot be easily observed

from the financial records of banks. The qualitative study approach, hence, remains supportive to provide the behavior of banks in the industry. From the literature review and established conceptual framework, the study, therefore, has identified the following aspects of bank conduct as preliminary start-up of the interview session: price, product/service offerings, research and development, technology introduction, differentiation, promotion, quiet life and expense preference, cooperation strategies.

7.4.1. Price

On the price aspect, one of the important findings from the quantitative study is that price collusion has not been the norm observed in the Ethiopian banking system. This has been witnessed through rejection of the SCP hypothesis as explained in the quantitative study section. Market abuses resulting from collusive behavior appear insignificant to affect the prices paid to resources as well as the interest earned from loans. This remains to be one of the surprising results in a market structure like the Ethiopian banking system (tight oligopoly⁴) where few large banks were predominantly taking the lead in major market areas. This has been a surprising result brought during the interview session with bank managers and regulators. The views from both groups of interviews have been similar and show that price has been set independently by the decision from the banks. Nevertheless, there were instances from the private banks to agree not to compete through prices or engage in price wars which were agreed to cause negative repercussions on the competitive environment. As shown in the interview, however, such attempts have also been constrained by several factors not to ensure collusion.

'The government bank which stood a price setter more specifically related to lending business, has a tendency to set the price at reasonably lower level than our bank and other private banks following its motive to access to finance to the wider community. We cannot call for a much higher price than the price set by the state owned bank because if we do for sure our customers will switch to the state bank demanding for lower prices.'(Interview BM7).

⁴ Salvatore (1998) identifies four different types of market organizations i.e. Perfect competition at one extreme, (b) Monopoly at the opposite extreme, (c) Monopolistic competition and (d) Oligopoly in between. In addition, Shepherd included the concept of the dominant firm as a firm having 50-100% of the market and no close rival. He further classified oligopoly in two to as tight oligopoly (The leading four firms combined 60-100% of the market) and loose oligopoly (The leading four firms have 40% or less of the market).

'We (private banks) through our banker association have agreed not to compete on price basis because at the end the cost of the decisions to engage in price war affects us more. For instance, any increase in our interest rate for deposit even if it allows for more deposit mobilization will narrow the spread from intermediation. We always might not have a privilege to keep a constant spread through increasing the lending rate.' (Interview B12).

'We (CBE) are a big bank with notable size difference. With whom do you think we can collide if we prefer any sort of collusion?'(Interview BM14).

'We (NBE) set the price for saving and fixed time deposit, because we need to lessen the propensity for banks to abuse the market through offering a lower rate to depositors. In addition, such variable is being used as a monetary policy to determine the amount of deposits kept in the banking system. The revision in rates has a tendency towards encouraging saving and investment in the economy.' (Interview RS1).

From the inputs of bank managers and regulatory staff, the study finds that:

- government owned banks which are on top of the efficiency front are enjoying the privilege of large market of cost saving deposit from public enterprises. Therefore, the cost of fund of the bank remained lower than the industry leading to less motivation to improve performances through price related measures.
- one of the guiding business motives of the state owned bank is related to undertaking social responsibility through ensuring accessibility, raising bank awareness and use, financing priority sectors as set in government policies. This remains distinct from the motive of the private banking system which predominantly relies on maximizing shareholders' wealth. Therefore, such variation in business objectives and ownership structure has led different perspectives across the banking system in relation to collusion on prices setting.
- the other scenario which obtained attention is that the substantial difference in the size of state and private banks has limited the possibility of market collusion. This is because the big bank will not have a motive to

cooperate with small banks to ensure market collusion. The big is always big no matter how it collides with other or not.

- the observed price related cooperation, as a reflection of market collusion, belongs to the private banks which have a reduced share of the market. The private banks have signed a memorandum of understanding not to compete on price bases. The effect of such move to cause market collusion, however, is constrained by several factors including:
 - The private banking system remained a price taker as the big state owned bank takes in the price setting responsibility related to the intermediation business. The price for credit of state owned banks appears less than the private counterparts. This constrains the private banks not to deviate much from the price set by the state banks. Otherwise, a notable deviation in prices enforces the private sector customer to make shift to state owned banks demanding for lower government services.
 - The minimum price paid for saving and fixed time deposit is set by regulation and hence provides little room for the private banks to envisage better earning through reducing their costs of deposits.
 - Homogeneity of services offered by both private and state owned banks has also eased the switching cost of customers and rarely enabled a platform to institute a variable price based on service differentiation.
- On the other front, the less risk taking behavior of banks which is a result of stable market condition and regulatory restrictions has impacted any attempt to pursue on price collusions.
- Market protection from foreign banks as well as local banks such public banks have also affected the price setting mechanism in the market. Price therefore is not mainly a result of the supply and demand theory but remained fixed in most of the period unless there is a move for the regulatory to alter interest rates.

Overall, even if there has been an effort from the private banks' system to engage in price collusions, its effect has not been significant, but has helped banks to enjoy stable earnings from intermediation business with a liberty to alter their lending prices in a way to keep their spread constant. Therefore, price remains

not a worry to the banks and is not considered as an essential parameter to change performances. In addition, price related measures are discouraged through regulation, different motives of state owned and private banks, substantial size difference, risk taking behavior and market protections. This remains to be one of the critical theoretical contributions of this study. In market situations, dominated by big size bank but with notable size difference across firms, where price regulation guides price setting mechanisms, an attempt on price collusion remains ineffective. In such scenario, banks desire not to compete on price basis and prefer the option that keeps their earning level constant.

7.4.2. Product and Service Offerings

The banking sector, characterized by multi-product/service offering, is characterized by similar bank product and service offerings. This is because bank products have the characteristics of being easy to copy and lack of adequate patent protection. As a result, competitive advantage that a bank gains from its products/service offerings may not last long (Watkins, 2000). Similarly, bank managers and regulatory staff mostly have expressed a related view with the above arguments. For example,

'As you are well aware banks offer similar range of intermediation and payment services. Pursuing product specialization is not an easy task considering the easy adoptability and lack of protection.'(Interview RS3).

'Banking by nature is a universal service. The banking products offered are homogenous not only in Ethiopia but also across the world. What we attempt to do is to position the products well in the market. However, our product offering are similar to other banks.' (Interview BM13).

'... If we introduce a new product today, then after a few days, even tomorrow, all other banks would have the same product.'(Interview BM2).

Nevertheless, there is a different view with regard to services among bank managers:

'We treat services to be different from products. Banking products can be easily copied but the intangible services are not. We try to be different in service delivery and that is the major reason why customers choose us.' (Interview BM9).

'Services to certain extent can also be copied. However quality of services delivered in consistent manner, customer treatment and relationship are the foundation to our competitive advantage.' (Interview BM6).

A similar direction has been pointed by the regulatory staff:

'We don't want banks to involve in price wars. What we encourage a war between banks (if any), is the war through service differences. We need to ensure that banks are well positioned to provide convenient services to their customers. Compliant from service failure such as maltreatment of clients, customer discrimination could also result in penalty. This is unlike a failure by a bank not to introduce products. Except failure on core product offerings such as account opening, forex services, credit etc the choice of product introduction is an option left to the banks management.' (Interview RS3).

As explored from the interview result, bank product offering in the banking system remains homogenous as a result of lack of patents for bank products and the tendency to get easily copied. Although managers and regulatory staff in general recognized that bank product offerings are homogenous, they consider them as a key source of their competitive advantage. For example:

'..... this (similarity of bank products) did not mean that bank products are not important. They remain to be a foundation upon banks could make an impact on performances. A bank having full-fledged services at its branch could attract more customers than a bank with limited product offering at its branch.' (Interview BM2).

'You know, the bank products offerings carry the brand of a bank. If you have a good brand with full package product offerings then you can produce significant incremental revenue or profitability.' (Interview BM11).

The above statement shows that in addition to services, product offerings are also important from managerial perspective. Overall, with the existing banking structure,

- the banking system in Ethiopia is offering homogenous products with an added value on products through:
 - Adding a range of services provided to products
 - attaching brand value to the homogenous products
 - concerned to provide full fledged banking product menus to the customers
- service difference has been an important reaction taken by the banks to win market share and build their competitive advantage. This however is driven by both:
 - Internal and intentional motive of the management to attract customers
 - A regulatory direction that encourage banks to compete and differentiate themselves from the move of the market.

7.4.3. Promotion

Promotion is one of the essential activities of businesses to properly position themselves in the market. The benefit arising from the promotion not only affects the financial performances through spearheading business activities but also creates an added value in the form of goodwill. Nevertheless, such understanding might not be equally shared and utilized by all banks in the system. Moreover, specifically, banks operating in a concentrated market will have a lower tendency to promote their services as the customer is left with a meager option to select among service offerings of banks. This is because the concentrated structure will provide little choice to customers as there are few banks operating in the system. In addition, banks in such structure usually have the upper hand in the market following the large demand for banking services, more specifically of those related to credit and forex resource offerings. Therefore, large demand restrains banks to allocate huge investment on promotion. In order to explore the banks' strategy towards ensuring a growing market share through promoting their product and service offering, the following question has been framed: 'is promotion important to banking business and what is the significant of promotion?' There is a common view regarding the importance of promotion across bank managers and regulatory staff:

'Yes, I believe that banking services and products should be promoted. This is not only from the perspective of ensuring better performance through increasing the number of customers but also to ensure a wider banking awareness among the society.' (Interview BM7).

'Banking by nature is a service engagement whose delivery and approach need to be promoted to customers through various approaches. If you are not promoting products how the customer knows that you are different?'(Interview RS4).

'A critical part of banks asset is the goodwill associated to its brand. You cannot think of a brand and positioning without having a successful promotion program. In addition, bank promotion enables your presence in the market, branch location and product offerings.'(Interview BM5).

Overall, the interview findings show that despite the homogeneity in product service offerings, there is a consistent understanding that banks need to promote their product offerings to their customers. The benefit associated with promotion to banking business as pointed out in the interview includes:

- promotion positively contributes to improved performances through increasing the size of banking business. This consists of both ensuring a growing business from new clients as well as existing customers of banks. Hence, bank usage rate increases with the effort of promotion.
- the interview result also pointed a benefit beyond financial success of using promotion. Promotion can be effectively used as a means to create banking awareness among the wider society. This in the future will be a potential platform to increase the banking customer bases.
- promotion has also been cited to have important implication on bank differentiation. Banks can tell to their customers on their specific specialties or competitive advantage through promoting their different offering to the customers.
- promotion is also found as a critical component of the banks engagement to build image in the market. This is translated in the form of a strong brand that offers the benefit of well positioning in the market.
- furthermore, promotion provides information to customers on branch location, prices, and product and service offerings.

With the backdrop of such benefits and purpose of promotion, bank managers are asked about the method of promotion applied in their bank: what promotion approaches are used by your bank? The study result shows a slight variation across banks on their promotion approaches. However some banks have been utilizing innovative promotion approaches like customer visits, social media etc. For example:

'We have been using the common media of promotion such as ensuring a consistent presence on local Tv channels, radio programs, on print medias. However, we usually look for to increase the rate of customer referral through personal selling.' (Interview BM4).

'We have found the presence on medias like Tv and radio a bit expensive which limits our intent to appear in such type of commercials on frequent basis. Therefore, we usually prefer the personal selling approach. We also invite potential clients through arranging a customer tour program in our bank premises. We are also observing another cost effective media, the social media like facebook, twitter and business sites linked-in to promote our bank' (Interview BM10).

'We are successful to win promotion in the print media like publications on newspapers at a dedicated page and magazines (cover and back of the page). In addition, we use frequent TV and radio presence along with a lottery campaign encouraging savers and forex transfers.' (Interview BM6).

The above explanation points that banks have been promoting themselves through a mix of approaches and consisting of personal selling , customer visit, TV and radio advert, publications (newspapers and magazines), social media, lottery offerings etc. Nevertheless, aggressive promotion attempt viaTV and radio targeting the mass market is affected by the high investment requirements. This enforced banks to divert their promotion approach to other cost effective media. In addition, some banks appear innovative in their approach through scheduling customer tour events, arranging lottery programs targeted to encourage saving and forex earnings, as well as utilizing customer referral which is based on service satisfaction as an effective form of promotion. Overall, given the market structure, banks (both state and private) have been considering promotion as a means to

ensure financial success, encourage savings, forex transfer as a means to create banking awareness.

7.4.4. Differentiation

The degree of differentiation is another important factor that determines bank conduct. This is because absence of differentiation (homogeneity) would impact conduct and performance so that there is one price for all sellers and the market shares are determined randomly (Bain, 1968). Therefore, differentiation is important in structure since it could strengthen the firm's market position and profit and acts as an entry barrier (Church/Ware, 2000). This is due to the fact that in case of strong brand loyalty, the new entrant should convince consumers to buy its product instead, by offering better terms e.g. quality or price, or greater advertising (Church/Ware, 2000). Indeed, the differentiation approaches are diverse to include services, products, markets, marketing approaches etc. With such background, the study has proposed to investigate the degree of differentiation in the banking system by forwarding a question to bank managers that reads, 'what is the differentiation strategy of your bank?'

The responses obtained are much directed towards lack of a specific differentiation approach in the banking system with few exceptions related to market differentiation strategy followed by few banks. For example:

'Even if our bank (name omitted) is privately owned, we are a bank of the public. Therefore, our product offerings target the mass population. We offer common banking products positioned through a mass marketing promotion approach.'(Interview BM3).

'We consider both retail and corporate markets addressing their demands through variety of service offerings. We provide focus to the retail business with the motive to mobilize resources from diversified sources. However, we consider our service offering as a differentiator but offer similar products and pricing mechanisms.'(Interview BM5).

'...(name omitted) bank is privately owned public banks but offers a wide range of products and services to retail and corporate banks. In addition, it also offers

products to specific markets (like interest free banking). Even if our products are the same we are engaged in aggressive promotion and service differentiation.’(Interview BM10).

A manager at a bank however explained that:

‘We (name omitted) offer a differentiated banking products to’ a niche market’ structure targeting the corporate clients. The retail banking approach requires a large branch and staff which have a bearing on our cost of doing the business. Therefore, we have introduced a single branch banking model supported by multichannel banking approaches and technology frameworks. Currently however we are heading to the retail business through increasing branch outlets and extending our market reach to the retail business. Such change in a strategy is mainly a result of push from the regulator.’ (Interview BM2).

From the interview experience, it is found that:

- market differentiation is not a widely used approach in the banking system. Majority of the banks are serving both the corporate and retail clients with minor modifications on their product offerings. Even some banks target the retail business, which is a mass market, with the basic aim of collecting resources from diversified sources. This ensures banks to manage the risk arising from deposit concentration through operating on a diversified deposit base.
- service differentiation, however, appears to be the way followed to differentiate bank offerings in the market. Nevertheless, the practicality of such approach is paradoxical on the ground that and as stated in the interview most banks are not in a position to differentiate their markets. Therefore, ensuring a differentiated service in a mass market remains to be a practical challenge to witness the existence of service difference. This is because the differentiation might not be observable and felt by customers If banks are serving different client groups at same outlets with similar products,
- most banks are also following comparable marketing approach targeting the mass population. The promotion package also seems ineffective to differentiate the market and customer segments. This among other justifies

the rarely observed differentiation with regard to the promotion approach followed by banks.

- an important exception to the aforesaid scenarios is that there was an attempt by a bank to serve a niche market through targeting corporate clients. This has been done in a way to address the need of the market segments. However, regulation tends to reverse the move of such bank towards public bank offering as done by other banks in the system. Such regulatory enforcement, therefore, remained an important variable in the system directing banks towards homogenous service offering targeting the mass market.

Overall, the banking system in Ethiopia mostly follows a mass market approach addressing the need of both retail and corporate clients with undifferentiated product and marketing approaches. In addition, regulatory measures also discourages differentiation related to market demanding for a homogeneous market reach and ensuring a growth approach through opening large branch networks mainly serving of the retail businesses. This remains to be one of theoretical contribution of the study that banks operating under tight regulatory regimes; regulation intends not only to ensure the safety and soundness of banks but also to influence the growth strategy of banks by directing banks on the market they serve and their accessibility requirements. In addition, banks operating under tight policy framework will not have an option to choose their differentiator strategy. The only allowable differentiator, service offering, will also remain ineffective in cases where a wide market differentiation approach is not allowable to be pursued. Technically, therefore, the regulatory move among others calls for homogenous bank offering discouraging differentiation in most areas of activities.

7.4.5. Proximity through Branch Networks

One of the policy frameworks guiding the growth of banks through ensuring accessibility of financial services to the community is branch growth. The quantitative study result however shows that branch growth has been intense even during the times when banks were privileged to decide on the level of branch expansion. With such framework, the study also finds a surprising result posing a negative and statistically significant impact of branch growth with performances.

With such consideration the study has taken branch growth as an important variable that determines the conduct of banks in the system. The quantitative study aims to find out the reason behind an aggressive branch opening move from the commercial banks despite its negative implication on performance variables. Therefore, the study has raised the following questions to obtain the views of bank managers and regulatory staff: What is your stand regarding bank growth through the traditional branch network? How do you explain the negative impact of branch growth?

'We consider building a wide branch network as a vital instrument in the resource mobilization effort. Large branch network not only ensures growth but also provides the benefit of obtaining a diversified deposit source. At the backdrop of this branching has an obvious disadvantage of demanding effort to manage large resources, contributes to cost increase through lifting branch running costs in the form of staff size and rents.' (Interview BM14).

'I consider branching as one of the critical success factors for better bank performances. This is because branch offers the advantage to promote banks, creates convenience to customers ensuring proximity of services, and allows growth enabling market reach. Nevertheless, branching has a demerit of restricting differentiation, exposes bank to costs related to internal control to prevent employee mal practices.' (Interview BM10).

'A branch remains an important point of contact for customers. Through opening large branches you will get large number of marketing staff, the branch managers. Therefore, you don't need to highly involve in promoting yourself through high cost channels like TV and radios. Branching however impact performances through ensuring large stock of non profitable branches. Unless the head office effectively uses the resources from branches, the cost of opening the branch outweighs the benefits.' (Interview BM9).

'I take branching as a critical means to cope the competition in the system. Banks are competing through increasing the branch network. I would allow my bank to neglect the move of other banks and limit branch growth. I know that excessive branch network has cost implications, boosts the competition in the sector, and takes management time.' (Interview BM1).

'We consider branch growth not only as a financial success determinant but also ensure the government stance for financial inclusion through allowing access to finance. Branching decisions might not have a large negative impact on performances as long as banks are able to position their branches well and monitor their performance of their branches. This is one of the areas to pursue a responsible banking culture through offering banking services near to the premises of the under banked population.' (Interview RS2).

Participants suggest that branch network quite often offers benefit to the growth in the size of banks. Nevertheless, from suggestion put fore ward of the weakness of branching, it is inferred that branching has an obvious implication on cost and hence profitability. In line with the findings in the quantitative study, branch opening, however, remains a critical move for most of the banks. This is explained from the perspective of:

- offering a reliable means to mobilize large resources from the wider community;
- allowing diversification of the resource bases of banks;
- promoting banks and appear as an important channel to promote bank product and service offerings;
- creating convenience to customers through ensuring proximity of services;
- allowing bank growth by enabling a wider market reach;
- allowing the benefit of a decentralized marketing scheme through offering assigning branch managers as marketing staff to promote the bank;
- Substituting high cost promotion channels like TV and radios;
- chasing the move from the competitors; and
- Supporting the pro poor policy via allowing financial inclusion and access to finance to the poor.

Nevertheless, the benefit explained to branches has been pointed out to have recognizable drawbacks. This is well cognizant by the bank managers as well as the regulatory staff. However, regulatory staff has a perspective that branches' impact on performances could be improved through a resilient system of branch performance management. The drawbacks of a large branch network growth on performances suggested in the interview include:

- it demands the effort and time of management to manage large resources;
- branching contributes to cost increase affecting profitability. More specifically, the cost increase is associated to branch running costs expressed in the form of increase in staff size and branch premise rent costs;
- it has a demerit of restricting differentiation through ensuring a determined way offering services ;
- branching also enforces banks management to spend high cost in strengthening their internal control system so as to protect the branch being affected by employee mal practices like fraud;
- it impact performances through ensuring large stock of non profitable branches. Unless the head office effectively uses the resources from branches, the cost of opening the branch outweighs the benefits; and
- besides, the notable cost implications of branching, boosts the competition in the sector.

Overall, the study finds a justification for one of the surprising results of the quantitative study. The negative relationship of branch growth on performances, therefore, is a result of the significant cost of branch opening that negatively affects profitability. Branching also impacts performance by increasing the cost of establishing a robust internal control system. Furthermore, large branch network has also some hidden costs related to consuming management time to handle bulk resources, boosting competition among banks and restricting differentiation. However, this has been implied to result not only from the financial implications of branch opening, but also from the effective use of head-office to use branch resources as well as management's capacity to lift up weak performing branches etc.

7.4.6. Innovation/ Research and Development/Technology

Another perspective to look at banks conduct is via exploring banks behavior towards engaging in research and development. This ensures banking as a knowledge based endeavor to be competitive in the market through non price related undertakings. The innovative activity involves not only products but also include processes, marketing, services, etc, supporting banks' attempt to develop new brands (Grigorova, 2008). With this in mind, the quantitative part of the study

finds that exploring the banks' move on the innovation front through dedicating resource on research and development as an essential parameter to determine conduct. Therefore, the study forwarded the following questions to bank managers: What is the commitment of your bank towards research and development? Does innovation identified as a major component of the strategy of your bank? What are the key innovation focus areas and the challenges thereof? The study result confirms that conceptually banks accept the relevance of innovation in sustaining the well being of the bank in the growing market competition. However, the challenges are pervasive. For example:

'We support innovation being a pillar to our bank growth. It determines not only growth but also ensures sustainability of the bank in the market. Customers now days are demanding for more innovative products and services. This has been spearheaded by the increase access and use of technologies. Therefore, our innovative approach targets technologically supported products delivered through mobile and internet. The main challenge associates with the low usage rate of the products, preference to branch services, high cost of investments etc.' (Interview BM11).

'I consider innovativeness to be a mandatory path to follow by our bank in the future. It offers not only bank efficiency via reducing service delivery costs but allows customer to enjoy banking services on demand. Banks need to be omnipresent to serve their customers everywhere and upon demand. This has a challenge from acceptance from regulation, lack of internal capacity to introduce innovative ideas.' (Interview BM4).

'As a reflection of the reliance on the importance on innovation, we have established an internal knowledge and innovation unit which brings world standards and innovation ideas to our bank. We consider this as critical to our survival and as a competitive advantage to win the market. Nevertheless, strict regulatory barriers, rigid KYC requirements, underdeveloped technology infrastructure, capital intensiveness of innovation and low usage rate are the reasons holding us back in the innovation front.'(Interview BM7).

'Technology related innovation is emerging as a preference of customers. However, still our customer prefers to use our branch network for banking services. The low level of awareness, lack of legal framework to handle cyber crime, under

developed technology infrastructure following a sole owned internet supplier, easy adoption of innovative products has limited our move not to be aggressive in such front. (Interview BM12).

Banks find that technology (like the internet and mobile based) related innovation have important implications not only on their financial performances but also on their future well-being and competition strategies. This is because the bank customers, who have more access and use of technologies, are demanding for more innovative products and services. Besides the demand from customers, innovation offers positively to bank efficiency via reducing service delivery costs and addressing the customer need for on demand banking services. To fulfill such motives, some banks have established an internal knowledge and innovation unit which work to introduce world class standards and innovative ideas. Nevertheless, the innovative move of banks has faced several challenges that include:

- low usage rate of technology related products arising from low level of customer awareness;
- customer preference to branch banking services that comforts bank customers through face to face interaction;
- high cost of technology driven products;
- regulatory need to endorse new products;
- lack of internal capacity to introduce innovative ideas;
- lack of legal framework to handle related cyber crime increasing the security of banks;
- under developed technology infrastructure following a sole owned internet supplier;
- rigid requirements related to KYC in the attempt to control money laundering; and
- Easy adoption of innovative products by competing banks limiting the first mover advantage.

Overall, innovation appears to be one of the behaviors determining bank conduct in the Ethiopian banking system. Nevertheless, its level of impact has been challenged to impact the industry performances due to several factors including costs, lack of capacity, low awareness level, easy adoption rate, lack of well

developed infrastructure and regulatory barriers, etc. However, the effect of regulatory restrictions on innovativeness is not accepted by the regulatory staff. for instance, interview RS3 explained that:

'We have been directing banks to be more innovative. Even we have taken the foremost important step of enforcing banks to operating with a core banking system. in addition, we have established a framework for banks to share borrowers information online, automated the payment system and a system to network bank ATM so that they can be accessed by all banks customers.'
(Interview RS3).

From the above explanation it can be inferred that the regulator has been supporting banks to introduce and use technology related products. However, the regulatory stance is mostly directed towards creating a common platform to share technology and technology resources among banks in the system. The regulator doesn't seem to accept technology difference as an important arm banks competitive advantage. Even the move in some areas like sharing ATMs also discourages banks not to invest in e-products that will not allow creating market differentiation and offering for distinct bank services. Therefore, regulatory move on the one side is supporting technology use by banks. Nonetheless, it is also limiting differentiation through technology related product offerings. The long waiting times to secure approval of new products from the regulator however is perceived by banks as a barrier limiting the innovation endeavor of banks.

7.4.7. Legal Tactics/ Merger and acquisition

Banks face competition from both rivals in the banking sector and in the non-bank firms such as microfinance. Through merger and acquisition (M&A), large banks become multi-product financial service and multinational conglomerates in order to exploit scale economies (Berger et. al., 2010; Buch and Delong, 2010). Whereas small banks focus more on traditional strategy that allows them to deliver highly differentiated small business products and banking services (DeYoung et al., 2004). In Ethiopia as well, recently, the two state owned banks, the CBE and CBB have merged together with the intent of ensuring better control of state resources. This has created a wide spread sentiment in the private banking system as a coerced move towards merger and acquisition. The capital requirement at the end of the GTP II period is considered by some banks as a

guiding standard leading to forced merger. Nevertheless, there appears no clear statement on what will happen to a bank that fails to meet the capital requirement. From the interview experience, however, it is explored that banks have no intention to engage in willful merger unless the regulator insists on the process. This is mainly due to the difference in the approach of market segmentation (by region, religion, political group niche etc) and the positive perception related to the untapped market for banking services in the country. For example a bank manger BM5 noted that:

'We opt for organic growth as our market base, as set by the founders of the bank, is distinct and cannot fit with other banks. Moreover, we are growing well with high profitability records, so what merger could do to us?' (Interview BM5).

Banks, however, seems prepared to accommodate mergers in case the regulator claims for forced merger and acquisition progression:

'During crafting of our strategy we have analyzed the effect of merger and acquisition. That will help us to get ready in case there is a push from the regulatory organ.' (Interview BM9).

The interview with the regulatory staff shows that there is no plan from the regulatory side to enforce banks to engage in merger process:

'We don't have a plan to force banks to merge. But banks can take such strategy as one way of ensuring growth. The issue of merger cannot be raised from our side as long as banks are performing well ensuring safety and sound business.'(Interview RS2).

Overall, merger and acquisition are not considered as one way of ensuring growth in the banking system. Except on few cases, banks strategy entirely relies on organic growth. This is because of the convenient scenario in the industry to ensure natural growth as well as variation in the market segmentation strategy of banks. Nevertheless, there is a potential for merger and acquisition process during the times when the regulator trusts that banks are not safe and sound to deliver banking services. Therefore, bank merger and acquisition process mostly are not driven internally by the choice of banks' management and cannot be considered as a significant factor determining the conduct of banks at least at the

current time. In the future, when bank competition grows and rivalry develops, the option appears a second way out set by the regulator for banks to forcefully accept it.

7.4.8. Risk Avoidance

The quantitative study finds that there is a tendency towards a high risk taking initiatives among the banks in the system as reflected in a heated intermediation business that positively and significantly related with profitability. In order to explore the issue further, the banks' choice on risky activities is a question that has been set: what is the risk taking experience of your bank? The managers' views on it shows that banks prefer to engage in the intermediation business, which is a risky activity, because there are limited areas of banking activities as well as other options like forex business alone cannot ensure growth and profitability motives because of the acute shortage of foreign currencies in the market and due to lack of a well developed market. For example:

'We know that we should take high risk to remain profitable. Intermediation is at the core of our growth and profitability as we don't have an option to pursue further on other engagements due to their limited scope of expansion and availability. In addition, the banking system is not supported by both primary and secondary markets due to lack of well developed stock and bond markets.'(Interview BM7).

'What we need to be profitable is to mobilize local resources as much as possible. We know that there is a stiff competition to get forex resources abundantly. The high demand for credit also a pushing factors towards channeling our business in the intermediation front.'(Interview BM12).

The above explanation shows that the lack of well developed market (primary and secondary) has limited banks' choice related to risky activities. Despite the high risk attached to intermediation activity, the banks' drive has been to push hard to mobilize local resources from the market and lend it to the needy customers. The underdeveloped market doesn't allow them to diversify their business through offering additional services like investment banking and others. Furthermore, the high rivalry in the forex market has put the banks in rare option to diversify their business undertakings.

7.4.9. Expense Preference Behavior/Quiet Life

As shown in the quantitative study, the test for the quiet life hypothesis has rejected the existence of a quiet life scenario in the Ethiopian banking industry. Even if the banks are operating in highly concentrated markets, ensuring efficiency through controlling scale of operations and improving their managerial efficiencies remain an important element of the banking business. Nevertheless, the market share variables has resulted in a mixed output where it has positively associated with scale efficiency but remained negatively associated with the managerial efficiency measures. Banks enjoying a high market share consider the scale of operation as an important determinant of their performances but their management engages in a quiet life behavior. Therefore, with the intent of exploring justifications for the aforesaid relationship, a specific research question, i.e. what may be the reason towards a high expense control behavior in your bank?, was designed to get the banks' view on it. The interview data shows that the managers agree that managing expenses have been a focus of management. This is because banks have a limited option of revenue growth sources and believe that expense growth related to salary, general and administrative expenses has impact on profitability of banks. For example a bank manager BM11 noted that:

'Managing expense is one of the critical activities of management. Expense growth unless managed could consume our earning, which is collected from limited revenue channels...' (Interview BM11).

Banks even view that the growing expenses has impacted the management decision on long term growth ensuring activities such as pursuing further expansion, enhancing technology capacity, introducing new products, promotion etc.

'...We know that our growth endeavor should balance on activities that ensure short term profitability and long term institution build up. Nevertheless, our expense size sometimes coerces us to focus on short-term goals as we need to pay a good level of dividend to our shareholders.' (Interview BM7).

The study also aimed to get explanation with regard to the positive relationship between market power and managerial efficiency. In view of this, a question has

been extended for banks managers to indicate areas whereby the management witnesses a relaxed expense decision.

'We by regulation are required to set a dedicated budget for human capital development, which is 2% of our total capital expenditure.'(Interview BM3).

'Our branch expansion strategy as well as employment decisions are sometimes involves the direction from the government. Even if the expenses have implications on our profitability we do it as instructed as we are established to fulfill objectives beyond profitability.' (Interview BM7).

Overall, as observed from the explanation, banks generally have no preference to expenses. This is in line with the quantitative findings that concentration has not significantly related to price measure. Therefore, banks cannot easily adjust their prices to compensate for the change in expenses, mainly related to operations. In addition, banks have limited scope of revenue sources which allow engaging in a relaxed expense management. Consequently, expense control is considered by the banks as an important driver to maintain profitable banking operation. Such attitude on expense even if allowed to meet the profitability motive, it remained a constraint to drive banks' interest towards long term growth ensuring activities. This obviously limits the competitive capacity of banks through establishing a differentiation theme as discussed in previous section. In some cases, like employee capacity development, however, banks by regulation are required to prefer expenses. In addition, state owned banks with development motives are required to prefer expenses to fulfill the needs of the society for banking service through opening large network of branches as well as creating employment opportunities to new graduates. Therefore, the study finds that regulation and influence of owners (like state) remains one of the determinants of bank conduct with regard to expense preferences.

7.4.10. Cooperation Strategies

One of the conducts of banks operating in high concentrated market is a cooperation strategy designed by banks to win the rivalry arising from big commercial banks. More specifically, small banks which standalone cannot cope up the competition move of the big banks that prefer to form an alliance with other banks in their group. The quantitative study finds that there has been an attempt

from private banks to form an alliance with regard to avoiding competition in the form of prices. With the objectives of exploring further areas of alliances, we have set a question that reads, 'what are the cooperation areas of your bank with other banks?'. The study finds that there is an established alliance as framed by the regulator for banks to cooperate in information sharing, common use of ATM networks, automated payment system. Nevertheless, banks have no well designed cooperation strategies except on few cases related to information sharing on borrowers profile, bank performances, etc.

'We don't set a strategy to create alliance with other banks. We usually consider other banks as our competitors not our alliances....' (Interview BM9).

'We usually cooperate in sharing information related to borrowers. We share some resources like ATM and the payment system as it is prescribed by the NBE.'(Interview BM13).

Overall, banks including the small banks don't attempt to respond to the threat arising from the competition from big banks through establishing a strategic alliance framework. The alliance observed in the system is usually derived from the push from the NBE for shared use of resources and information sharing. This has limited the opportunity for banks to perform well in some fronts. For instance, small banks can extend large loans by involving in syndicated lending practices with big banks. Such practice, however, is not well developed because of the banks' views in considering other banks as competitors not a strategic alliance partners to boost their operation in some areas. Therefore, banks are pursuing a standalone competitive strategy which in the long-term challenges small banks' capacity to set down the rivalry arising from the big counterparts.

7.4.11. Other Bank Conduct Determinants

The qualitative study also investigated conducts of banks other than the one explored above considering the market structure with the aim of exploring additional determinant of banks behavior. Some banks managers pointed that employee retention which affects customer retention is one of the competitive strategies of their banks.

'Retention of key customer contact employees was very important for maintaining existing customers. Successful staff retention strategies could provide opportunities to retain existing customers which otherwise switch to other banks subsequent to the resignation of the key staff.' (Interview BM12).

'We compete with banks not only by snatching customers but keeping our key staff. In such endeavor, we always set our compensation and benefit package at the top of the industry.' (Interview BM7).

A manager in interview also stated that their top management reputation is crucial in terms of helping them convince customers.

'Banks are in a game to attract reputable managers to run their business and the one with the best management group would win the game.'(Interview BM14).

Others also suggest that the *quality of relationship with shareholders*, which determines the existence of board and top management stability, as an important element of their bank growth.

'I think the quality of the relationships with our shareholders is a key to create board and management stability as the shareholders are powerful to enforce continuity or removal of bank management and board.' (Interview BM2).

In sum, the qualitative study finds some important variables impacting conduct and performances of banks. These include employee retention, top management reputation and relationship with shareholders, which impact customer retention, new customer acquisition and stability of board and management, respectively.

7.5. Impact of Bank Specific Factors on Performances

The quantitative study finds that out of the six variables selected to represent bank specific factors four of them were significant and considered to be drivers of the banks' profitability. The qualitative part of this study further explores the reason for the established relationship as well as the suitability of the proxy variables and the framework used to investigate bank specific determinants.

7.5.1. CAMELS Framework

The quantitative study is a result of a CAMELS framework which is mostly used by the regulator to rate bank performances. It considers bank rating across six areas of performances: Capital adequacy, Asset quality, Management, Liquidity and Sensitivity to market risk. The quantitative study has excluded to explore the effect of sensitivity to market risk on bank performances due to the under developed financial market in the system. The study has set a question to evaluate the bank managers and regulatory staff awareness on the use of the rating framework: do you know about the CAMELS framework? It finds that the bank managers and regulatory staff are well aware of the framework as the regulatory organ follows similar approach to rate banks performance on quarterly basis. For example:

'The NBE uses the CAMEL (excluding Sensitivity to market risk) to rate banks' performance. The result of the rating is communicated and discussed with bank management on quarterly basis.' (Interview RS1).

'On quarterly basis, we gather our rating from the regulatory organ. This is done based on CAMEL rating.'(Interview BM6).

The study, therefore, explored that the framework is the widely used tool to rate banks in Ethiopia and excludes the Sensitivity of market risk due to the reason forwarded in this study. Further continuing our discussion, we have set a question to find out what variables are used to measure the performance in each component of the framework. The variables suggested by both bank managers and regulatory staff are alike and are closer to the proxy variables used in the quantitative part of the study. For example:

'We use the capital adequacy ratio, the non -performing asset ratio, return on asset along with return on equity, liquid asset to deposit to measure the level of capital adequacy, asset quality, earning performances and liquidity of banks. For management rating we usually use mix of qualitative and quantitative parameters like budget actual variation, audit and risk findings, compliance to NBE rules and issues arising from our onsite examinations.'(Interview RS3).

'The NBE rating on our bank performance incorporates our capital adequacy ratio, level of non-performing loans, liquid asset to deposit and earning level. They usually

compare us with our peer groups and conduct trend analysis. Management rating relies on compliance to their directives but considers discrepancy reports of our internal audit.’ (Interview BM13).

The quantitative study of this research has used the capital to asset ratio, provision to total loans, return on asset and return on equity along with price measure NIM, liquid asset to deposits to represent the capital adequacy, asset quality, earning and liquidity position of banks. In addition, it has used proxy variables such as managerial efficiency and the cost to income measure to represent management performances quantitatively. This has a bit variation with the standards used by the regulatory organ to measure bank performances. This, however, is justifiable in most of the cases because of the confidentiality of some of the variables (like NPLs ratio), absence of the input to measure some elements in the financial records (like CAR), the study’s objective to observe the effect of bank concentration on the price behavior of banks (NIM) and the limited use of qualitative variables in the quantitative study (management). Nevertheless, the researcher has brought the variables used in the quantitative study to be evaluated by bank experts and regulatory staff. It finds that:

- the use of capital to total asset instead of capital adequacy ratio is justifiable considering the unavailability of records mainly related to off balance sheet activities in the financial records of banks. Even if it exists, it will be cumbersome to engage in risk conversion process. On the good front, the capital to asset ratio appears to be a perfect proxy of the capital adequacy ratio as most of the on balance sheet components including loans and advances are 100% risk conversion rate. In addition, the change observed in capital adequacy ratio associates with the changes in both asset and capital side performances of banks. Such change will adequately be observed even through the use of the capital to asset ratio.
- the use of provision to total loans instead of the non-performing loans ratio also appears reasonable as banks are not disclosing their non-performing loan sizes as it might affect their reputation. Nevertheless, the provision level which directly follows the amount in nonperforming asset holdings will be a perfect substitute to evaluate asset quality of banks. In addition, the

measure even appears better than NPLs as banks are required to hold provision for bad assets other than loans and advances.

- the use of liquidity measure through liquid asset to deposit is found to be in line with the regulatory rating standard.
- the application of earning measures such as ROA and ROE is also consistent with the regulatory standard. In addition, the studies use of business mix through adding a proxy variable share of non-interest income from the gross earning of banks (NIITI) is also supportable as the regulatory usually observes the core earning sources of banks. The use of price measure to measure earning performance also goes in line with the aforesaid motive and, hence, its application will not deviate from the banking rating system of the NBE.
- a wide variation observed in the rating system of NBE and the variables in the study relates to management rating, which is a mix of both qualitative and quantitative measure as used by the NBE. The quantitative study, however, has used quantitative proxy variables such as cost to income and managerial efficiency to measure management performances. The use of the managerial efficiency is found to be consistent with the NBE's assessment on budget actual performances. This is because the NBE evaluates banks' performance against their budget in terms of key growth parameters like deposit, loans, income and expenses. Similarly, the managerial efficiency measure used in this study is the result of branch, deposit and fixed assets in the input side subjected to expenses (staff, interest and general) in the price side as well takes into account loans and other earning assets as output of bank performances. Furthermore, bank managers pointed that the use of cost to income ratio is also relevant to the study as cost control remains to be a critical part of the management endeavor. The gap in quantitative study, therefore, relies on the total exclusion of qualitative factors in the model. This, however, has been addressed in this study through using a qualitative approach to determine bank conduct. The broader assessment in bank conduct has been suggested to successfully fill the gap in the quantitative study. This is because the regulatory rating on management mostly relies on the performance of banks as compared to their strategies. A detail exploration

in such regard has been made in the qualitative study as shown in the above section.

Overall, considering the above findings, the mixed method approach used in the study remains useful not only to confirm the suitability of the proxy variables but also to narrow the study gap created to quantitatively investigate management performances. Furthermore, the qualitative study confirms that the use of CAMEL with exclusion of Sensitivity to market risk to evaluate bank performances remains supportable and relevant.

With this in mind, therefore, we have moved to explore the bank managers' and regulatory staff's views on the established relationship between some of the variables in the CAMEL framework with bank performance measures.

7.5.1.1. Capital Adequacy

The quantitative study finds that the capital to asset ratio remains significant in all the models where it acts as a regressor, suggesting its statistically significant impact on bank profitability and price performances. The unexpected result is that the direction of impact provides a mixed result where the CAR has been found to positively relate to RoA and NIM but remains negative in case of RoE. The qualitative study finds similar justifications in the established relationship as pointed in the literature review part of the study. For example:

'I believe that a high capital to asset ratio, which is a result of large capital base and/or relatively small asset size, allow banks to engage in high risk activities ensuring effective use of liquidity.' (Interview BM1).

'High capital requirement serves a buffer to risk, hence motivates banks to take high risk. This allows earning high profits. In addition, it allows banks to focus on cost saving deposits that leads to operate enjoying large spread and hence net interest margin.'(Interview BM13).

'Capital draws the return on equity of banks as it set an expectation for banks to proportionately increase their earning level.'(Interview RS2).

From the above explanation, it can be shown that capital to asset ratio impacts performances in mixed manner. In one front, it ensures profitability improving

banks' ability to absorb risk and creating a reliable liquidity status. On the other side, it affects performances of banks if they are not in a position to generate a proportional profit as compared to their capital holdings.

Further the study explored if there will be a change in the result had the quantitative study uses the capital adequacy ratio. The result, however, shows that there will not be significant change in the study output as capital to asset and capital adequacy ratio maintain similar behavior with regard to the selected performance measures. This is because similarly capital adequacy could be higher or lower based on the asset holding of banks and their capital position. In addition, if large capital drives banks towards high risk taking, the balance sheet composition will be towards high risk assets whose risk conversion rate is 100% equivalent to risk unadjusted assets.

7.5.1.2. Asset Quality

Another finding from the quantitative study is the commonly used proxy metrics to measure asset quality. PRTL has been positive and insignificant in the RoA model, but witnessed significant and negative relationship with RoE model. The model related to price (NIM) similarly shows negative and insignificant relationship with PRTL. In addition, the quantitative study has forwarded reliable justifications with regard to the established relationship. The researcher has brought the study result to be discussed by bank managers and regulatory staff to explore for additional justifications and to know whether the relationship is acceptable among the bank experts. The result shows a much consistent findings except a different view from some managers with regard to the relationship of RoA with profit measure, ROA.

'I believe that asset quality will be a significant determinant of the earning of banks. This is because a bank with high problem asset stock pays the cost in the form of provision expenses which directly draws down the earning from asset held.'
(Interview BM7).

The suggested relationship, however, appears to support the quantitative study result and the justifications thereof. The positive relationship of asset quality (PRTL) with RoA. as discussed in the quantitative study section, is a result of the low level of nonperforming asset holding of banks. Therefore, as the corollary of

the explanation of the bank managers, the justifications could mutually be expressed as: a bank with low nonperforming assets will be benefited maximizing its earnings by controlling the impact from problem assets. This leads to low provision expense to consume the earning from the asset it holds.

On the other hand, the quantitative study shows the proxy variable, NIITI, remained a significant driver of profitability measure. Nevertheless, it has insignificant effect on the price related performances. The direction of relationship however is positive in all models considered. Similarly, the experts' opinion provided further clarifications on the established relationship between management's capacities to ensure better asset quality through establishing appropriate level of business mix (Non-Interest Income to Total Income, NIITI) with performance measures. For example:

'The positive relationship of NIITI with performance is valid in consideration of our business undertakings. We drive large profit from two core business channels: lending and forewing banking. If we do well in both channels it's obvious that we can drive large profit.' (Interview BM5).

'The statistically insignificant effect of NIITI with price measure, NIM, arises from the limited sensitivity of the non-interest income to both deposit and loan prices. If there is any effect, it will be on the deposit side, as we are deploying local resource to mobilize/purchase foreign currencies.' (Interview BM14).

The above arguments explicate the fact that banks' attempt to institute a diversified income base through directing their asset mixes towards fee based services along with interest earning assets ensures not only better performance but also enables to maintain quality asset portfolio. This is because the asset mix drives banks towards less risky activities such as foreign business and other services, whose effect on asset quality problem is limited.

7.5.1.3. Management

The quantitative study has used two proxy measures to quantitatively represent management performances: the managerial efficiency measure, the X-efficiency (XEFF) and management's ability to control costs (cost to Income, COIN). The first proxy variable, XEFF, established a statistically positive relationship with performances showing that performance of some banks could be improved

through increasing the efficiency of management. The established relationship in some models, however, is not statistically significant. Furthermore, the second proxy variable, COIN, has a negative impact on all the models but the relationship is statistically significant with RoA. Such result has been discussed with the bank managers and regulatory staff in an attempt to explore for further justifications to the result. The experts' opinion strengthens the study's argument and provided further clarifications on the established relationship. For example:

'It seems obvious that management capacity is a determinant factor ensuring better performance. I think the statistically insignificant relationship is a result of homogeneity in management approach with regard to running the banking business across the banking industry.' (Interview BM13).

'Top management experience is a plus to bank performances but currently banks are competing on areas challenging management talent.' (Interview BM1).

'I believe that Management's contribution to our banking business is significant but I trust that that contribution is limited by the rigid regulation that doesn't allow management to engage in innovative business practices and inculcates a fear towards risk taking. I think this should be changed allowing the management the liberty to lead the business through relaxing regulations.'(Interview BM9).

'I don't think that currently bank management is playing a key role in the banking business. It's usually the regulatory which is guiding how the business operates and even determines the growth strategy and plan of the Bank. What should be the role of management if it's not involved in strategy matters?' (Interview BM4).

The explanation above remained relevant to the quantitative study, more specifically, to the insignificant contribution of managerial efficiency to performances. The tight regulatory framework which discourages risk taking in banking business apart from traditional and common banking endeavors has limited to use top management experience in innovative practices. Furthermore, regulation has also taken the critical role of management in some cases such as strategy setting that establish areas and modes of bank growth. However, there is a suggestion from bank managers for improvement in managerial efficiency allowing the freedom to be used as a competitive tool. In addition, there is a need to enhance management capacity in tandem with the growth in the size of the

industry and the banks in it. On the other side, there is a mixed view with regard to the effect of cost control (COIN) on performances. For example:

'I believe that cost control ensures a lean operation; hence profit margin will be wide ensuring better performance in relative terms (ROA and ROE).'(Interview BM2).

'I think excessive cost control diverts management attention from long term growth ensuring parameters such as expansion, research and development, promotion and even customer services could be affected by excessive cost control. I believe management should create a balance between the short term and long term goals by in placing healthy expense management.'(Interview BM14).

From the above explanations, it is noted that the impact of cost control on performances has established the right statistical relationship. Nevertheless, the qualitative study shows that cost control should be supported by an optimum expense management strategy that ensures a balance to meet both short-term and long-term goals.

Overall, on top of the above useful explanation on the result of the quantitative study, the findings related to the two proxy variables shows the possibility of measuring management performance utilizing quantitative study approach. In this regard, the study contributes two important proxy variables, the XEFF and the cost to income ratio as a measure of management performance which measure management's capacity to lead the banking business and to management expenses, respectively. Most importantly, the study has introduced a measure based on a linear programming model, the Data Envelopment Analysis (DEA) that integrates various variables as input and output to produce an efficiency score to represent managerial performances. In addition, the study finds a simple ratio based approach which initially allows bank to compare performances through bank-bank comparison as well as by establishing a trend within a bank. As shown in the next section, the use of DEA to measure performances has not been widely used in the Ethiopian banking system.

7.5.1.4. Liquidity

The quantitative study has used a proxy variables similar to the one used by the NBE to measure the liquidity standing of banks, the liquid asset to deposit ratio

(LADP). A mixed result has been witnessed in the three models with a negative relationship record in the RoA and NIM models and a positive relationship with RoE. As shown in the models, the impact of the above constraint has been significant on both profitability and price performance sides with notable exceptions on the RoE model. Based on the literature review, the quantitative study has provided reliable justifications on the established relationship. With the purpose of exploring further justifications and to investigate bank managers and regulatory staff view on it, the result has been discussed. The result from discussion finds that excess liquidity holding by banks could potentially draw earning through setting idle and non-productive asset holdings. On the other hand, excess liquidity could serve as a buffer stock as well as a reflection of less risk exposure of banks that places less strain on the capital position of banks. For example:

'I think reliable liquidity position is a plus to banks as they can comfortably meet the credit demand of their borrowers. This will ensure growth and hence profitability.'(Interview BM3)

"Management should be strict on holding excess liquidity as it exposes their banking business to non-earning placements. Banks pay interest for every penny of deposits in their safe box. Therefore, placing in zero earning assets like cash leads to negative profit margin.' (Interview BM6).

'Excess liquidity and large bank capital sizes are conflicting as they lead to ineffective use of funds. In such scenario, cost of holding liquid assets outweighs the benefit earned. Therefore, I prefer if banks look for other investment option even in cases of a dried credit market.'(Interview RS2).

The above explanation shows that excess liquidity could reduce the profitability of banks through exposing banking on non-earning placements. Nevertheless, it can ensure better customer services to comfortably meet the credit demand of borrowers. The important finding of this study replicating the findings in the literature is that banks should consider their cost of holding liquid asset in determining their liquidity position. In other words, banks' decision with regard to liquidity should consider the trade-off between profitability and liquidity.

7.6. Impact of External Factors on Performances

The quantitative study has integrated sector and macroeconomic factors which are not under the control of management as external factors to explore their statistical relationship with performance measures. Based on the literature review, it has selected economic growth rate (RGDP), trade deficit (TRDF), inflation (INF), market growth rate (MKTG), bank size (LOGTA) and exposure to low cost deposit bases (DDTD) to represent sector and macroeconomic situations. Interview result on the use of the aforesaid variables shows that banks are both sector and macroeconomic specific factors during performance assessment. The growth in economy and inflation are the commonly cited variables used by banks to adjust their performance decisions. In addition, banks separately consider the export sector performance in their attempt to plan the amount of foreign currency earning they could mobilize in the system. Sector related variables, usually market growth and deposit mix, are also used in their peer to peer analysis. Nevertheless, the effect of bank size is not used to observe its impact on their performances. They rather rely on market share variable to follow the change in the level of their market share in the banking sector. Therefore, most of the variables selected in the quantitative study are being used by the banking system as to their effect on performances. Even if there are exceptions on two variables, trade deficit and bank size, their inclusion in the model appear relevant based on the previous works of literature as well as:

- Banks use of the export sector emanates from the excessive demand of the import sector for the foreign currency generated from export proceeds and other sources. However, the use of trade deficit rather than export allows observing the double edge impact of the export and import sector on bank performances.
- The purpose of using Bank size rather than market share in the study is also supportable if one considers the impact of economies of scale on performances. In addition, the study has used market share variable as proxy of market power as shown in the literature review.

Therefore, the choice in proxy variables in most cases appear consistent with the suggestions from bank managers with few exceptions. In exceptional cases, the researcher opts for a proxy measure that allows a much broader investigation on

selected matter as well as the one that fits with the purpose in which the research intends to provide useful contributions.

Most of the variables (RGDP, TRDF, MKTD and DDTD) have established a statistically significant relationship with in at least one of the performance measures. The qualitative part of this study further explores the reason for the established relationship as well as the suitability of the proxy variables used in the models. The result is as shown below:

The quantitative study shows that the impact of the economic growth rate (RGDP) on bank performance is positive and significant in the profit models. Nevertheless, unexpectedly the impact of RGDP on the price measure (NIM) is negative and insignificant. Basing on such result, Bank managers and regulatory staff are asked to put their views on the established relationship. The result finds that economic growth appears a major driver of bank performance. The reason cited for the positive impact of RGDP on profitability of banks is similar to the findings in the quantitative study. Therefore, the researcher diverts its attention towards exploring justifications for the surprise result: a negative and statistically insignificant relationship between economic growth measures with price performances. For example:

'I think the finding could be relevant as economy growth leads to excess demand for loans and also creates excess liquidity by increasing the saving potential of customers. Therefore, availability of credit in the market obviously allows borrowers to prefer low cost lending.' (Interview BM14).

'I believe that price in the Ethiopian banking system has a fixed nature; hence the change in economy could not much impact on the price of bank services.'(Interview BM1).

The interview result shows a mixed view with regard to the effect of economy growth on price performances. On one front, it draws banks to adjust their lending rate as the economic growth creates excess demand for credit. Therefore, the availability of credit in the system provides borrowers the comfort to compare prices and choose the one offering low rated credit products. Nevertheless, price adjustment in the banking system is not significant and its volatility is controlled

through non-price competition agreement of banks. Therefore, it appears meaningful to find a statistically insignificant relationship among the two variables.

On the other front, the impact of trade deficit on performances shows that being a net importing country has a negative and significant impact on both profitability (RoA and RoE) and price (NIM) measures. The justifications forwarded during the interview are identical to what has been reported in the quantitative study.

With regard to inflation, the quantitative study finds that the annual rate of inflation has established a positive but statistically insignificant relationship with performances. The result suggests that better bank performances are related in times of high inflation. This remains to be unexpected result warranting further justifications through the qualitative study approach. The interview result shows a mixed output. For instance,

'I thinking inflation, especially of a hyper inflation situation, negatively impacts bank performance through limiting economy growth by discouraging saving.'
(Interview BM3).

'I believe that bank performances are not much affected by inflation and other monetary policy instruments. This is because we don't have a well functioning market system that sets market based prices. How can the effect of prices variation could be felt without the first having an organized market?'(Interview RS4).

'We don't adjust our price based on the movement in inflation rate. This obviously will be an advantage to the borrowers as they are required to repay their loans in the nominal interest rate.'(Interview BM11).

'Depositors' motive to place funds in banks mostly relies on safety of their funds rather than to get benefited from the interest yield. Therefore, inflation remains weak to influence the decision of depositors (to place money in bank accounts).'
(Interview BM7).

The input from the interview shows a mixed output: on the one side, inflation is believed to have a strong impact on bank performance by affecting economy growth variables and discourages the saving propensity by attracting low real interest payments. As shown in the quantitative study, the real interest rate in the

Ethiopian banking system is negative in the periods considered. On the other side, bank experts argue that absence of a well functioning market system that determines prices through demand and supply of funds limits the sensitivity of performances with the change in inflation. In addition, a strong argument raised related to banks is not adjusting their interest rate in line with the move in the inflation rate. Therefore, both savers and borrowers are entertained with a nominal interest rate. In such a process, the borrowers benefit from a reduced real interest while depositors earn the output of a negative real interest rate. This, however, is mitigated by the depositors' intention to deposit their saving at banks with the purpose of safety of funds. Banks as well are compensating the loss from inflation from their lending cutting back their real interest payment to the depositors. Such practice seems to negatively impact the depositors rather than the banks, but its level of impact on depositors is not known. The study, therefore, finds that the impact of a real negative interest rate on the depositors as a further researchable area.

Overall, as explained above, the qualitative study has benefited from exhaustive and strong justifications for the insignificant and positive impact of inflation. It also appears relevant to stick to the quantitative output relying on the market practices and the price setting behavior of banks (see the quantitative study section).

The qualitative study also supports the result from the quantitative study with regard to the statistically positive and significant relationship between market growth rate (MKGD) and profitability measures (RoA and RoE). In addition, the quantitative study finds that the growth in market is negatively associated with the price model (NIM). The justifications are much similar to the quantitative study. Similarly, the variable representing banks size, natural log of total assets (LGTA), has positive and statistically insignificant relationship with profitability. The impact has been insignificant in all models. The qualitative study however shows that there is a perception among banks managers and regulatory staff that bank size impacts performance positively and significantly. For example:

'Large banks have developed not only financial and operational capacity but have the capacity to manage large resources, have well developed risk management system to control their credit and other risks. I think this will positively impact their performances.'(Interview BM13).

'Large banks through their wide branch network can mobilize adequate level of resources that impacts their credit disbursement and hence earning. I believe that the impact from their branch and IT infrastructure on performances should not be undermined.'(Interview RS1).

In this regard, the quantitative study result varies from the justifications forwarded by the banking experts. The researcher attempts to address such variation through replacing the bank size variable with the market share variable as suggested by the banks managers and regulatory staff in the combined model.

The impact of building a low cost deposit structure through increasing the share of demand deposits in the deposit mix, (DDTD) is positively related with performances in all models. Nevertheless, the relationship is statistically insignificant in the profit models while it is statistically significant in the price models. Such mixed result in the level of impact across the models is found to be pertinent to get benefited from the justifications from bank managers and regulatory staff. The interview result also entertained a mixed output. For example:

'You know the ability to mobilize low cost deposit like demand deposit is one of the competitive advantages of large banks like CBE in the system.'(Interview BM13).

'Banking cost is not only associated with deposits, but also incorporates staff expenses, general administrative expenses. You might not observe the benefit of cost saving from deposit, unless you are able to manage all the expense components.'(Interview RS1).

'Demand deposits could provide cost saving advantage but by increasing its share in the deposit mix you are exposing yourself to the risk of deposit volatility.'(Interview BM6).

'Low cost deposits like demand deposits obviously reduce the cost of funds of banks. This will widen the spread and hence the net interest margin and profit of banks. In addition, it allows banks to operate without worrying for increase in cost in times of excess liquidity. Nevertheless, this might discourage banks not to take high risks as their funds are largely composed of zero cost deposits.' (Interview BM8).

Despite the mixed view, several of the above explanations support the quantitative study results. Like the quantitative study findings, interviewees argue that cost saving from high share of low cost deposits will benefit performances by reducing the banks cost. Nevertheless, its impact might be insignificant as demand deposits are not a stable fund to be wholly utilized for lending purposes. In addition, the benefit from cost saving deposits might be lost unless there is a robust control on other expense components. Its effect can also be reduced if it indulges banks' management in low risk taking endeavor as the low cost pushes management towards keeping excess liquidity as cost of holding liquidity is low and its trade-off with profitability is not significant.

7.7. Impact of Regulation on Bank Performances

The quantitative study has used the regulatory variables used by the National Bank of Ethiopia and attempted to establish a statistical relationship as to their impact on bank performances. The explanatory variables comprise those variables used by the NBE to moderate and ensure price stability, guarantee safety and soundness, establish entry barriers, determine modes of growth as well as direct a portion of banks fund for national development objectives. The view of bank managers and regulatory staff on selected variables is consistent and matches with the quantitative study. This will not be a surprise as the NBE usually sets the regulatory framework by issuing pertinent directives which can easily be accessed by the public from their websites. Besides its experience in the banking sector, the researcher has used the directives of the NBE to identify relevant proxy variables for regulation. Such approach finally succeeded in identifying compressive variables which are consistent with the views from bank managers and regulatory staff.

With regard to the study output, discussions with the bank experts are held during the interview session with the objective of ensuring acceptance of the relationship and gather further justifications on the established relationship.

As observed in the quantitative study, the exchange rate has positive and significant relationship with the profit models. This remains to be a surprising result considering the banks' strategy of holding major portion of their foreign asset in less volatile currencies like USD. Similarly, the change in exchange rate has positive relationship with the price measure but not statistically significant.

The explanations given below are diverse views carefully built justifications towards the positive effect of the exchange rate regime on performances.

'We are in comfort zone with regard to a predictable exchange rate situation. This is because we are able to hold our foreign currency reserves in stable currencies like USD, this shield us from risk of currency fluctuations.'(Interview BM13).

'The NBE follows a managed currency regime; it not only sets the rate of currencies but determines the type of currency holdings. This limits the banks discretion to choose their foreign currency holdings. We are coerced to choose a currency whose rate is stably fluctuating.'(Interview BM1).

'The NBE sets the spread among the buying and selling rate, which is not allowed to vary above 2%. In addition, it has limited the currency gap through setting an allowable limit, which is 15% of capital. This along with predictable currency rate has eased the currency management allowing us to maximize the earning from foreign transactions.'(Interview RS3).

'Our foreign currency inflow is mostly from non-USD sources, but the NBE has set the USD only as a predictable currency type. We are exposed to cross currency risk while we convert non-USD inflows to USD.' (Interview BM12).

'Depreciation of Birr against US dollar enables the growth in the export sector as exporters are benefited from the translation of USD to local currencies.'(Interview BM7).

There is an expectation from the banks that a depreciating exchange rate could pose a serious threat in performances .Nevertheless, the quantitative study finds that the depreciation of Birr against USD has positive impact on banks profitability. This is because banks certainly determine the level and direction of change in the USD rate and has responded through holding their currencies in USD. In addition, the regulation has put a meager option to choose the currency types to transact and hold their reserves as the allowed currency for such purposes is set by the regulator. Despite the benefit of such practice to divert banks asset towards stable currency type shielding them from currency fluctuation, it exposes to cross currency risks. Banks are expected to transact their non-USD currencies, whose rate is determined at the international market, with USD. In cases where non-

USDs are expensive as compared to USD, banks are, therefore, expected to pay more of non-USD currencies to acquire USD. Furthermore, the depreciation of Birr against USD favors exporters transacting in USD as their export earning is translated to match the value in local currency. This is expected to support the export business which allows the sector to generate foreign currencies whose reciprocal effect benefits the banking business.

On the other front, the minimum rate on saving and time deposits have established a negative but statistically insignificant relationship with profit and price models. This is an expected scenario considering the negative effect of an increased deposit rate on the yield from intermediation business. The justifications from the interview are also consistent with the quantitative study. Change in the deposit rate is obviously negatively related with performances as it affects the cost of fund of banks.

Another monetary stabilization policy requirement, the reserve requirement, has also established a positive and insignificant relationship with both price and profit models. The direction of relationship, however, is unexpected in view of the downward effect of a high reserve requirement on intermediation business via holding the loanable fund of commercial banks into non interest bearing assets. The justifications forwarded during the interview appear relevant to witness the insignificant statistical relationship:

'The NBE has set a constant reserve requirement, which mostly lies at 5% of the total deposit. The amount of reserve therefore appears small to affect performances.' (Interview RS4).

'In times of tight liquidity position, we request permission from the NBE to use the fund at the reserve account. With such option and lower rate of reserves, the effect of reserve might not be material.' (Interview BM7).

Overall, the limited and stable rate of reserve ratio along with the banks' option to use the fund in reserve account, which is usually not withdrawable but is allowed when banks are under tight liquidity position, has mitigated its effect on bank performances.

With regard to the effect of change in the entry capital on performances, a mixed result is witnessed in the performance models, i.e. positive in ROA and NIM models and negative in RoE model. The effect is, however, statistically significant in the ROE model only. The justifications are consistent with our explanation related to capital to asset ratio as a regulatory move to increase capital results in increased capital to asset ratio. Likewise, the interview result appears similar to the quantitative findings and the justifications thereof (see the quantitative study result of the previous chapter).

The policy direction of the NBE that determines future growth direction of banks and growth in branch network (BRG), surprisingly, resulted in negative relationship in all models. The relationship, however, is much stronger in the profit models and is statistically insignificant in the price model. The result is discussed with bank managers and regulatory staff. The result shows a mixed view with regard to the established relationship between branch growth rate and performances.

'I believe that growth through high branch networking enables to mobilize large resources from the bank market ensuring accessibility. The mobilized resources then translate to credit disbursement that ensure asset and profitability growth. Hence, I expect a positive relationship.'(Interview RS1).

'Establishing a wide branch network is an expensive endeavor. This mostly is severe in late entrant banks that are expected to investment significant sum to establish the network.'(Interview BM13).

'Branch expansion is costly as it affects the expense components related to rent and staff. These will draws down profit until branches are in a position to register a positive profit records.'(Interview BM7).

Overall, the justifications by large supports the result of the quantitative study by exploring the notable impact of a large branch network on profitability. The view of the interviewees, however, directs that branch network is more expensive than large banks and could provide long term benefits to ensure resource mobilization. In addition, the long term benefit is associated with the expected level of improvement in performances of already opened branches as time goes on.

As pointed in the quantitative study, the number of entrants to the banking system has a positive but statistically insignificant association with bank performances. The qualitative study has developed good justifications on the result of the quantitative study. For example:

'During the times of relaxed bank entry requirements, a number of private owned banks have emerged in the system. This has ensured a competitive spirit in the banking system that enhanced the performance of not only late entrants but also long staying state owned banks.'(Interview BM14).

'Entry of private banks in the system is supported by large ratio of population to bank. In other words, this signifies large potential to expand banking services.'(Interview RS3).

'Bank entry barriers through lifting the capital requirement have limited the entry of banks to the system. This has protected the existing banks from competition of the new comers. The protection extends up to banning foreign banks not to operate in the banking sector. Such protection has freed the existing banks from rivalry boosting their performances.' (Interview BM9).

As explained by the bank managers and regulatory staff, the banking industry in Ethiopia is highly protected not only from foreign competition but also from local banks through setting entry barriers that entirely bans foreign banks involvement and lifting entry capital requirements. In addition, it is pointed that increased bank entry has been at the right time when competition in the system was not stiff and is at the time when the large population remained unbanked. This is associated with easy growth trajectory along with budding competition that positively enhanced the performance of both state and private owned banks. The study also finds further researchable area in subject and related to the effect of foreign banks entry in the Ethiopian banking system which obviously has pros and cons towards the development of the sector. Even if there was no prior experience of a foreign owned bank in Ethiopia (except during the pre-socialist era), a lesson could be derived from countries having similar banking and economy profile as Ethiopia.

The quantitative study also points that the critical policy direction to involve banks in national development endeavor, Bill purchase (BILL), has a negative and statistically significant impact on all performance models. This remains to be not

surprising considering the effect of bill purchase to divert funds from businesses that could make high earning to low earning investments like the bill purchase. The relationship has got wider acceptance from the banks' management despite a different view from the regulatory staff. For example:

'The banks investment on government bills draws profitability downward as we are obliged to place significant sum of our costly deposit in low yielding bills, which is attached to 3% interest.' (Interview BM7).

'The bill also impacted our resource mobilization endeavor via channeling the deposit in the banking system to government expenditure. As the government usually bids internationally for the supply of the required inputs to construct the dam, the possibility of the fund to revert to the banking system is low.' (Interview BM6).

'The bill purchase requirement is further strengthened via setting portfolio limit on short term loan exposures (one year tenure), which is required to be 40% of the total loans. Therefore, we are expected to repurchase the bill at least on annual basis.'(Interview BM11).

'The bill purchase contributes to unfair competition to reign in the system. This is because it excludes the big state owned bank and it also benefited the state bank to take our deposits as the government accounts are maintained at the state banks.' (Interview BM2).

The justifications from the bank managers are pervasive indicating the wider impact of the policy requirement on bank performances. The impact is reflected on the reduction in the earning rate from the investment, drawing down the resources of banks and ensuring unfair competition, etc. The prospect of the impact is indicated to be severe in the long term following additional policy measures attached to bill purchase which further increases the exposure of the bank. Such view, however, is not fully accepted by the regulatory staff. For example,

'I believe that the bill purchase has contributed positively to bank performance mopping up the excess liquidity of banks to earning investments like the bill purchase.' (Interview RS2).

'The effect of the bill will not be severe if banks are able to mobilize deposits from the market. As we can see from the recent developments, banks are mobilizing large resources and are operating at improved profit. The GTP II circular, which requires for a 30% growth in deposits, is also an attempt in such front. If banks can ensure growth by the stated rate, the bill will not impact on their performances.' (Interview RS3).

There seems a different view from the regulatory staff with regard to the effect of bill purchases. They argue that the bill purchase has even positively contributed to performances by absorbing the excess liquidity of banks. In addition, they claim that banks can easily mitigate any effect arising from bill exposure by increasing their resource mobilization endeavor.

7.8. Summary

This part of the study has aimed to qualitatively explore the findings from the quantitative study. It has used the views from both bank managers and regulators to build justifications for established statistical relationship of which some of them are surprising results. In addition, another relevant contribution of the qualitative study is related to investigating the behavior of banks operating in a concentrated market. As identified in the literature, such variables as bank conduct, has been a neglected topic in the traditional SCP hypothesis. This is due to the claim that bank conduct is a derivative of the industry structure on the one hand and the difficult to quantitatively test the behavior of banks in the system as the proxy variables are not quantitative by nature or else data is not available as they are not represented in the financial records of banks. The quantitative study however investigated that bank conduct is not necessarily a derivative of the industry structure. There are various factors beyond concentration that are mainly from internal, external and regulation that are shaping the conduct of banks in the industry. Such findings from the quantitative study is also supported by the result of the qualitative approach that has witnessed a different behavior of banks than the one suggested by the SCP hypotheses. For instance, given high market concentration, banks in Ethiopia are behaving differently in price competition which remains a less essential parameter to change performances. Service difference has been an important reaction taken by the banks. Banks have been promoting themselves through a mix of approaches and attempted to increase

their market share via increasing branch networks. In addition, besides market structure, regulation has been the most important variable affecting banks performance via encouraging homogenous service offerings, similar bank growth strategies and controlling their asset quality positions. Unlike what is claimed in the SCP hypothesis, the qualitative study shows that organic growth, not merger and acquisition, is considered as a dominant strategy that ensure growth in the banking system. Bank risk taking behavior also appears in contrast to the hypotheses as banks behavior towards risk is guided by the development status in the financial market as well as the competition level in alternative markets like foreign banking. The quiet life test result is also unlike the one suggested by the SCP hypotheses as banks are found to be conscious in their expense management decision. This has been a different result had a structure based derivative has been followed in the study. The qualitative study also explored additional variables determining bank conduct such as employee retention, top management reputation and quality of relationship with shareholders. The aforesaid factors could have been difficult to observe had the quantitative approach been solely used and an approach to determine bank conduct from the industry structure has been followed. Therefore, the qualitative study has not only supported the quantitative result, but has addressed to explore hidden variables that have significant implication on the behavior of banks.

With regard to bank specific factors, the quantitative study has confirmed the fact that the CAMEL framework to evaluate bank performances remains supportable and relevant. In addition, the framework has been utilized by the regulatory organ and is well known to the banks. The qualitative study has also confirmed the relevance of the proxy variables used in the quantitative models providing justifications in the areas where variation is witnessed. Furthermore, the qualitative study has provided justifications to relationships exhibiting surprising result and for variables with unstable relationship. For example: it has confirmed a positive and significant relationship of asset quality with performances claiming that a bank with low nonperforming assets maximize its earnings by controlling the impact from problem assets. Therefore, the quantitative study is supported to forward a meaningful result on unstable relationships with a good reasoning on the established relationship. On the other hand, the qualitative study pointed out the relevance of some variables which the quantitative study has resulted in

insignificant relationship. For instance, the insignificant contribution of managerial efficiency to performances is needed to be improved in tandem with the growth in the size of the industry and the banks in it. Therefore, important growth ensuring and future competitive strategies have been suggested in the qualitative study which had been ignored had the result is solely based on the quantitative result.

Similarly, in relation to external factors, the proxies used are evaluated through the qualitative study which in most cases is similar to the quantitative study but has difference in some of them. The study, therefore, is encouraged to provide further explanations for the inclusion of some of the variables in the model. In addition, the study has benefited from the mixed view of bank mangers and regulators on some of the established relationship. For example, the association of the rate of economy growth with performances has got contrasting explanations. As shown above, the variable has been unstable in the individual and combined model but remained consistent in the rank regression and combined value based models. The qualitative study, therefore, has elaborated the matter from different angles that allowed correcting the deficiency in the quantitative study by forwarding alternative justifications and ensuring consistency. Similarly, it has forwarded additional reasoning on unexpected results such as the association of inflation with bank performances. It has also identified areas for further research. For instance, the qualitative study suggests that the impact of a real negative interest rate on the depositors saving habit to be a further researchable area. Therefore, besides forwarding justifications on relationships and variable choice, the qualitative study has improved the quantitative approach to explore further areas requiring a separate investigation.

With regard to regulatory factors, the view of bank managers and regulatory staff on selected variables is consistent and matches with the quantitative study. In addition, surprise result from the quantitative study has also been justified well. For instance, the unexpected result of the positive association a depreciated exchange rate with performance was explained from several perspectives. In addition, justifications on the impact of the policy requirements related to regulation and national growth motives on bank performances are explored through qualitative study. This obviously enriches the findings of the quantitative study. On the other hand, as shown in the previous section, the quantitative study

has become a starting point to design the qualitative study. Furthermore, the qualitative study has pointed the type and level of interaction among several of the proxy variables and their interaction with performances. This is supported by the qualitative study to further look into the interaction among the proxy variables with performance measures. This will be an encouraging finding to built a comprehensive performance model not only observing the interaction of the proxies with performances but among themselves.

CHAPTER EIGHT

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

8.1. Introduction

This chapter aims to summarize the empirical results in the light of the research questions and the findings from the integrated mixed research approach. It also discusses the practical recommendations and policy implications of the main research findings, highlights the contribution of the study, outlines the limitations of this thesis and how it addressed the limitations and offers suggestions for future research.

The research is an empirical study that explores the impact of industry concentration in bank performances incorporating various control factors from the internal, external and regulatory environment. It has used a quantitative dominant sequential mixed methods research that combines the quantitative and qualitative methods intending to explore the research objective. The quantitative component of the study examines the relationships among proxies of industry concentration, efficiency, bank specific factors, external (sector and macroeconomic) and regulatory elements and between them and bank profit and price performances. It has used a census of 18 commercial banks operating in Ethiopia between the periods 1999-2015. It has used a panel regression combining both cross-section and time elements that established 193 total observations. On the other hand, the qualitative study explores the suitability of the proxy measures, provides justifications for the established relationship in the quantitative study and explores those factors which are required to be addressed qualitatively. The qualitative study relied on a semi-structured interview with 18 bank managers and regulatory staff. Therefore, the quantitative statistical analysis and qualitative interview-based studies investigated the central research question: '**how does industry concentration affect bank performance?**' This central question is broken into the following six specific research questions:

- RQ1: How does bank efficiency relate to bank performance?
- RQ2: is there efficiency variation among banks operating in Ethiopia?
- RQ3: How do bank specific factors relate to bank performance?

- RQ4: How do external (sector and macroeconomic) factors relate to bank performance?
- RQ5: what is the impact of regulation on bank performances?
- RQ6: How do banks respond to the prevailing market structure (bank conduct)?

Specially, RQ1 to RQ5 aim to assess the interactions among different factors from internal and external environment with performance mainly by using the quantitative study supported by the qualitative approach to evaluate the results and provide justifications for the established relationship in the quantitative study. RQ6 is a joint question that is explored mainly by the qualitative approach supported by an anticipated relationship from the quantitative study. By exploring the aforesaid questions, the study provides a comprehensive picture in terms of how bank performances and their determinant factors are measured and modeled within the context of the banking sector.

8.2. The Integration of Qualitative and Quantitative Approaches

The methodology and research design section show how the quantitative and qualitative approaches are integrated together during the data collection and data analysis stages. This section discusses how findings from the quantitative and qualitative studies are connected and compared in terms of modeling bank performance determinants. The basic theoretical and conceptual framework have originated from the traditional structure-conduct-performance approach with additions of some neglected variables like regulation and control variables from bank specific and external environments.

The quantitative data was analyzed following four steps. The first step was to investigate the relationships between industry concentration and efficiency variables on performances. In such endeavor the efficiency scores for bank level and industry wide performances are computed applying the Data Envelopment Analysis (DEA). The level and variation in efficiency among bank groupings was done. In addition, the competitiveness, determinants of efficiency and test for quiet life are conducted by following a statistical rule for variables relationship. The second step focused on relationships between bank specific and

performance measures following the CAMEL framework. Similarly, the interaction among external factors (industry and macroeconomic variables) with bank performances is conducted in the third step. The fourth step looked at relationships between regulation and financial performance. Subsequently the qualitative study explored the various determinants of bank conduct, built justifications for the above said statistical relationships and evaluated the suitability of the proxy variables used in the quantitative study.

The above mentioned steps allow the quantitative and qualitative approaches to be conducted under an overall conceptual frame showing that these two studies were framed based on similar ideas and structures. By doing so, evidence generated from the two approaches was easier to compare and cross-check, and achieve the purposes of triangulation and complementarity. The triangulation evidence proves that the empirical results of the quantitative study showed that some of the proxy variables representing market structure, efficiency, bank specific, external factors and regulations tended to have impacts on bank performance. Such result witnessing the fact that the hypotheses testing on the stated explanatory variables failed to reject the null hypotheses: the explanatory variables have no impact on bank performances. For instance, industry concentration measure, scale efficiency, capital adequacy, asset quality, economic growth, bill purchase, etc. appeared to affect significantly bank performances. Likewise, the qualitative study revealed that the identified relationship in the quantitative study in fact has impact on bank performances. It can be seen that findings from both approaches showed consistent evidence on the importance of the identified variables on bank performances. Previous studies ignored the impact of regulation and bank conduct on performances. This study, therefore, contributes to the literature by providing evidence on the interaction between regulation and bank conduct on performance following a mixed methodological framework.

The evidence provided by both the qualitative and quantitative studies supported the importance of regulatory variables in determining the performance of the banks. These results provide novel insight into how bank performances may be tested more generally.

Therefore, it can be seen that the quantitative and qualitative studies were closely integrated with each other in terms of providing confirmation of some important findings. This enhanced the external validity of the overall research. Apart from the triangulation of results, the combination of the quantitative and qualitative approaches also has the potential to overcome the limitations of adopting a single method.

8.3. Summary of Empirical Results

Given that the study used a mixed approach, the results presented in this section included findings generated from the quantitative and qualitative approaches in combination.

In connection to the central question, '*how does market structure /industry concentration affect bank performance?*', the study finds that the industry concentration measure related negatively with both profit and price measures. Therefore, the empirical result has rejected the Structure-Conduct-Performance (SCP) hypothesis which posits a positive and significant relationship between industry concentration and performances measures. The SCP postulates that banks in a concentrated market through their market power, influence price which ultimately contributes positively to their performances. Nevertheless, the finding in this study shows a converse effect of concentration and market power on bank performances. The negative relationship suggests that bank performances can be improved through ensuring a diversified banking structure rather than posing influence on price related performances. Even if this appears to be a surprising result in consideration of the high concentration revealed in the Ethiopian banking system, both the qualitative and quantitative studies have confirmed the negative impact of a concentrated industry on performances. The negative relationship is justified in the qualitative study as concentration limits bank competition via restraining a level playing field among the banks, limiting growth of the private banking system, contributing to bank inefficiency and benefiting large banks with sizeable capital level to easily expand their operations. Furthermore, it leads to less level of private capital accumulation, limited infrastructural development (such as IT) in the banking sector and spearheaded the rivalry among the private banks as they are competing on a residual market share. Nevertheless, the study finds

that the state dominated banking market offered several non-financial benefits related to ensuring financial stability by easing bank supervision, building banking culture to the wider part of the society, manifesting fair distribution of banking services in the country. In sum, state bank dominance ensured better socially responsible banking service to reign in the system via offering banking services to the wider community. Overall, the high concentration in the banking sector is negatively impacting performance of the banks and this has been well felt by the banks managers. Nevertheless, the structure has got support from the public bank managers and regulatory staff as it ensures to fulfill motives beyond financial success. The financial determinants like profitability, however, are consistently justified by both qualitative and quantitative results to be negatively affected by industry concentration.

On the other front, unlike the traditional SCP which claims an inverse relationship between bank concentration and competitiveness, both the quantitative and qualitative studies have confirmed a growing competition in the Ethiopian banking sector. Therefore, industry concentration is explored to be a less strain towards competition as long as banks face limited resources, such as, foreign currency and deposit in the market. The competition, however, might have different players or remains between those banks having limited access to those resources i.e. among the private owned banks as explored in the qualitative study.

With regard to sub research questions 1 and 2, i.e. *'How does bank efficiency relate to bank performance?' and 'Is there efficiency variation among banks?'*, the study finds that the scale efficiency of banks is the main cause of better performance. The scale efficiency coefficient (SEFF), provides statistically significant relationship with the performance measures. The finding suggests that banks operating at suitable return scale have been driving better efficiency which is translated to high profit performances. The empirical result supports the scale efficiency version of efficient hypothesis. The efficiency hypothesis aims that firms operating at optimum scale produce goods and services at relatively lower cost, therefore, better performance is a result of their capacity to operate at a lower cost rather than their power in the market.

In extension to such findings, the study has also pointed out that the major determinant factors ensure efficiency through quantitative and qualitative

approaches. It finds that banks ability to mobilize large resources, capacity to boost their loan book size, maintain their asset quality and diversify income sources through building other earning asset bases appear supportable endeavors to enhance the efficiency of the banks. The above findings suggest that the source of efficiency for banks is a result not only derived from a competent intermediation business, but also relied on their capacity to ensure diversified business mix via aligning non-interest income in their earning sources. In addition, efficiency is a result of instituting a better credit risk management framework that guarantees a lower level of nonperforming asset holdings.

On the other front, managerial efficiency variable (XEFF), has shown mixed relationship with the applied profit performance measures. For instance, the managerial efficiency established a statistically insignificant positive relation with RoA, but has a statistically negative and insignificant relation with RoE. The insignificant relationship rejects the managerial efficiency version of ESH. However, an interesting prediction is that banks can augment their profit records from their asset by increasing their managerial capabilities. This, however, is not much observed on the RoE whose denominator mostly falls under the discretion of regulatory environment. The variable has also been used in other models and the result remained the same showing the robustness of the result.

With regard to the efficiency variation among banks, a score from the Data Envelopment Analysis (DEA) has been compared with private small, middle and large state owned banks relying on the bank classification approach of the National Bank of Ethiopia (NBE). The result from the DEA score shows that the efficiency score of the state owned banks has been consistently on the top of the frontier while using both the Constant Return to Scale (CRS) and Variable Return to Scale (VRS). This remains to be an unexpected result in consideration of the anticipation for state banks' inefficiency which is the main government policy maneuvers. For instance, government action to enforce state owned banks to finance priority sectors at lower price is expected to affect their efficiencies via reducing their earning from intermediation. On the other front, the efficiency score for state banks remained strong even during the times when more private banks were entering in the sector. This suggests that the introduction of a private banking system doesn't alter the efficiency performance of the state owned bank unlike the expectation for its reduction due to a gradual takeover of its market

share by the private banks. There is, however, a mixed result in the efficiency scales among the private middle and small banks under CRS and VRS. The small size private banks, whose efficiency trend is coming closer to the middle level private banks, has a lower efficiency score as compared to the state owned banks and the middle level private banks under CRS. Nevertheless, unlike the CRS model, the small private banks registered a high efficiency score exceeding the level observed on middle size private banks' score under the VRS. The mixed result shows that most of the small banks are operating under an increasing return scale and the effect of size diminishes overtime. The efficiency score output by size, therefore, shows that the source of x-inefficiencies are mostly felt on middle size banks which are expected to improve their management capacity in line with the growth of their businesses.

Another important finding is that the efficiency score of private banks is characterized by a fluctuation trend with a down drop curve in recent period. The entry of new private banks seems to affect more the existing private banks than the giant state bank. Therefore, if one expects any sign of competition due to entry of banks in the market that will be a competition arising from private banks themselves rather than among state and private owned banks. The test for efficiency variation through both parametric and non-parametric tests, therefore, confirms that there is widely noted efficiency variation among banks operating in the country. For instance, in terms of the efficiency gap, the gap between the efficiency score of private banks and the CBE is on average 15 percentage points with a maximum difference of 31 percentage points in year 2007 which is substantial and remained strongly divergent. In summary, it appears that during the recent period, there was no improvement in the efficiency in the banking sector in Ethiopia and no convergence in the sector is apparent. State owned banks consistently record higher efficiency scores and the gap between state and private banks seems large and with modest increase. The result suggests that the largest state owned bank is more efficient than the private banks. However, the performance of the small banks is improving to exceed early entrant middle size private banks especially the differences are substantial in the VRS model. Thus, the main source of inefficiency is partly due to scale inefficiencies stemming from large banks but management inefficiencies could also be cited considering a growing efficiency score of small banks as compared to the efficiency score

growth of middle private banks. The overall DEA results under CRS show relatively low average efficiency levels, 84% with an efficiency level ranging from 75% to 91%. The average efficiency score under the VRS model shows an eight percentage point improvement to reach to 92%. Even with such level, there is still a room for an efficiency improvement through improving the input usage and control of their associated costs. In addition, public banks are more efficient with the highest efficient level as close to 1 in all the years by both the models. It is clearly shown that the Ethiopian banking market is still dominated by public banks. The qualitative study justifies that state banks access to cheap resources, support from the government to ensure access to limited resources like forex, regulatory support to stated banks through exclusion from some efficiency draining investments like bill purchases, in-depth experience on the business through long time stay in the industry as well as the public sentiment towards state owned banks offers implicit guarantee as a reason for the unique efficiency score of the state banks. This remains in line with the quantitative findings where banks that easily raise resources, enhance their lending capacity and capable to ensure diversified business (like forex) appear to be on top of the efficiency performances.

Concerning the third research question: '*RQ3: How do bank specific factors relate to bank performance*', both the constructed quantitative model and qualitative study explored that most of the proxies to measure bank specific factors are significantly related to performances. Therefore, the result rejects the null hypothesis that bank specific factors have no impact on bank performances. The constructed model has used the CAMEL framework which is a widely used supervisory tool to measure bank performances. The mixed study result shows that the capital adequacy ratio (CAR) remains significant in all the models suggesting statistically significant relationship with bank profitability and price performances. Nevertheless, the direction of impact is mixed where the CAR has been found to positively related to RoA and NIM, but remained negative in the case of RoE. The mixed result appears justified in consideration of the multifaceted impact of capital to asset ratio on performances. In one front, a higher capital to asset ratio improves profitability by enhancing the banks' risk assimilation capacity and creating a reliable liquidity position. On the other hand, it affects performances of banks as measured by the return on their equity as it

places burden on banks via setting an expectation for management to match the growth in profit in line with the capital holdings. The result is much similar to the findings in the literature as shown in the literature review section.

On the other front, the quantitative study finds a positive and insignificant relationship of the asset quality (PRTL) with RoA, but witnessed significant and negative relationship with RoE. The model related to price (NIM), similarly shows negative and insignificant relationship with PRTL. The qualitative study, however, identified that asset quality remains an important determinant of bank profit and price performances as problem assets directly affect the profit performance demanding for equivalent provision expense holdings. In addition, they affect prices by drawing down the earnings from granted loans. From the mixed result of the two studies, the research concludes that the low asset quality problem in most banks has concealed the potential impact of asset problem on performances. In addition, the study suggests the use of the actual rate of nonperforming loan ratio instead of the proxy provision to total loans in future researches attempting to investigate the impact from asset quality problems. This study has used the proxy measure as non-performing assets related data are not publicly available due to confidentiality. Nevertheless, the mixed outcome with regard to the direction of impact mostly relates to the differences in the sensitivity of the base at which the two ratios are computed i.e. asset and capital.

Another important finding of this study is that banks' capacity to ensure a diversified business mix (NIITI) remained a significant driver of profitability measure. Nevertheless, it has insignificant effect on the price related performances. The direction of relationship, however, is positive in all models considered. As shown above, the proxy variable not only appears as a significant driver of performance but is also a major source of efficiency. This arises from the double edge impact of a diversified business to ensure an enhanced income base and it's positive contribution to maintain quality asset portfolio.

The empirical result also shows that management's ability to control costs (COIN) has a positive impact in all the models showing that in addition to banks endeavor for boosting revenue through engaging themselves in diversified businesses, their specific experience in managing expenses appears to be an important factor in determining performance. Nevertheless, the qualitative study shows that cost

control should be supported by an optimum expense management strategy that ensures a balance to meet both short-term and long-term goals. Unlike the above finding, the managerial efficiency variable (XEFF), established a statistically positive relationship with performances showing that performance of some banks could be improved through increasing the efficiency of management. The established relationship in the models however is not statistically significant. The result appears unexpected, but explained in the qualitative study on the ground that the tight regulatory framework which discourages risk taking in banking business apart from traditional and common banking endeavors has limited to use top management experience in innovative practices. Furthermore, regulation has also taken the critical role of management in some cases such as strategy setting that establish areas and modes of bank growth. However, there is a suggestion from bank managers for improvement in managerial efficiency allowing the freedom to be used as a competitive tool.

Banks' ability to maintain a reliable liquidity position (LADP) witnessed a mixed result in the models: a negative and statistically significant relationship with the RoA and NIM models and a positive statistically insignificant relationship with RoE. Nevertheless, the finding is justified as excess liquidity standing could reduce the profitability of banks by exposing them to non-earning placements. Nevertheless, it can ensure better customer services to comfortably meet the credit demand of borrowers. The important finding of this study replicating the findings in literature is that banks' decision with regard to liquidity should consider the trade-off between profitability and liquidity. This accepts the commonly accepted liquidity- profitability trade-off theory.

Related to the fourth research question, *RQ4: 'How do external (sector and macroeconomic) factors relate to bank performance?'*, it was explored that some of the identified proxy variables are statistically significantly related to performances. Therefore, the result rejects the null hypothesis that external factors (sector and macroeconomic) have no impact on bank performances. As a variable representing macroeconomic factors, the economic growth rate (RGDP) on bank performance is positive and significant in the profit models. Nevertheless, the relationship on the price measure (NIM) is negative and insignificant. Unlike the individual model, the relationship is statistically insignificant in the combined model. The unstable relationship is also witnessed in the rank regression which

shows that the findings observed in the individual models are not robust with regard to economic growth impact on performance. The interview result also shows a mixed view with regard to the effect of economy growth on price performances. On one front, it draws banks to adjust their lending rate as the economy growth creates excess demand for credit. Therefore, the availability of credit in the system provides borrowers the comfort to compare prices and choose the one offering low rated credit products. Nevertheless, price adjustment in the banking system is not significant and its volatility is controlled through non-price competition agreement of banks. Therefore, the impact of economic growth rate on bank performances remained uncertain as witnessed in the unstable relationship. The result, however, shows the limited attachment of the banking sector to the performance of the economy. In other words, the downward or upward move of the economy has uncertain outcome to banks profitability. This, however, requires a further exploration on economic growth ensuring variables like specific sector performance and others. This remains to be out of the scope of this study.

On the other front, the impact of trade deficit on performances shows that being a net importing country has a negative and significant impact on both profitability (RoA and RoE) and price (NIM) measures. The result, therefore, points that the widening trade deficit should be one of the determinant macroeconomic variables to be considered by the government in its policy framework to improve bank performances. Most importantly, economies with enormous trade deficit that derived from the double edge impact of a rise in import demand and deteriorating export performances could potentially impact their banking performances. The sluggish growth in earnings from export affects the capacity to mobilize both local and foreign currency denominated resources from the market. The effect of such trend remained significant because of its strong effect on both channels of the banks income sources. On the one side, less export earning affects the intermediation business through limiting the opportunity to raise abundant local deposits. On the other front, it affects the earning from international banking activities by channeling lower amount of foreign currency to the banking system. Most importantly, the limited export earning leads to unfair competition and behavior to reign in the system.

With regard to inflation, the quantitative study finds that the annual rate of inflation has established a positive but statistically insignificant relationship with performances. This is a surprising result as it suggests that banks' performance get improved during increased inflation. The input from the qualitative study also shows a mixed output: on one side, inflation is believed to have strong impact on bank performance by affecting economic growth variables and discourages the saving propensity by attracting low real interest payments. On the other side, bank experts argue that absence of a well functioning market system that determines prices through demand and supply of funds limits the sensitivity of performances with the change in inflation. In addition, a strong argument raised relates that banks are not adjusting their interest rate in line with the move in the inflation rate. Therefore, both savers and borrowers are entertained with a nominal interest rate. In such process, the borrowers are benefited from a reduced real interest while depositors are earning the output of a negative real interest rate. This, however, is mitigated by the depositors' intention to deposit their saving at banks with the purpose of safety of funds. Banks as well are compensating their loss from inflation by lending cutting back their real interest payment to the depositors. Such practice seems to negatively impact the depositors rather than the banks. But its level of impact on depositors is not known. The study, therefore, finds that the impact of inflation on bank performance is uncertain and the impact of a real negative interest rate on the depositors as a further research area. Some scholars say that the relationship between inflation and banks performance is debatable (Athanasoglo, 2005), the direction of relationship is unclear (Vong and Chan 2009) or the effect depends on whether inflation is anticipated or unanticipated (Perry 1992).

The sector related variable market growth rate (MKGD) has a statistically positive and significant relationship with the profitability measures (RoA and RoE. But, it is negatively associated with the price model (NIM). The result is as expected following the argument that an expanding market provides an opportunity to mobilize resources at ease. Therefore, the intermediation business reinforced as a result of the strength in the supply side. With a parallel growth in the demand side (credit), the intermediation activity of banks will be strong to yield in notable profitability performances. Nevertheless, the study finds that the growth in market is negatively associated with the price model (NIM). This remains in line with our

argument above, where, in times of heated intermediation associated to high demand for credits and excess supply for deposits, the lending interest rate will be in pressure.

The impact of building a low cost deposit structure through increasing the share of demand deposits in the deposit mix, (DDTD), is positively related with performances in all models. Therefore, it is found that the increase in the ratio of demand deposit to total deposit increases the profitability of commercial banks. Like the quantitative study findings, interviewees argue that cost saving from high share of low cost deposits will benefit performances by reducing the banks' cost. Nevertheless, its impact might be insignificant as demand deposits are not a stable fund to be wholly utilized for lending purposes. In addition, the benefit from cost saving deposits might be lost unless there is a robust control on other expense components. Its effect can also be reduced if it indulges banks management in low risk taking endeavor as the low cost push management towards keeping excess liquidity as cost of holding liquidity is low and its trade-off with profitability is not significant.

With regard to the fifth research question: RQ5: *what is the impact of regulation on bank performances?*, the study finds that regulatory factors have impact on performances. The result on the regulatory proxies not only rejects the null hypothesis H_0 : regulatory factors have no impact on performances, but also appear consistent in terms of established relationship and level of significance in individual and combined models.

The study finds that exchange rate has positive and significant relationship with the profit models. In other words, the depreciation of Birr against USD has positive impact on banks profitability. This is because banks certainly determine the level and direction of change in the USD rate and has responded through holding their currencies in USD. In addition, the regulation has put a meager option to choose the currency types to transact and hold their reserves as the allowed currency for such purposes is set by the regulator. Despite the benefit of such practice to divert banks asset towards stable currency type shielding them from currency fluctuation, it exposes to cross currency risks. Banks are expected to transact their non-USD currencies, whose rate is determined at the international market,

with USD. In cases where non-USDs are expensive as compared to USD, banks are therefore expected to pay more of non-USD currencies to acquire USD.

The policy direction of the NBE that has a bearing on the future growth direction of banks, growth in branch network (BRG), surprisingly resulted in negative relationship in all models. The relationship, however, is much stronger in the profit models and is statistically insignificant in the price model. The justifications from the qualitative study by large supports the result of the quantitative study by pointing out the impact of establishing a large branch network on expenses which reduces profitability. The view from the interviewees, however, directs that branch network is more expensive to small than large banks and could provide long term benefits ensuring resource mobilization. In addition, the long term benefit associates with the expected level of improvement in performances of already opened branches as time goes on.

The quantitative study also points that the critical policy direction to involve banks in national development endeavor, Bill purchase (BILL), has a negative and statistically significant impact on all performance models. The impact is reflected on the reduction in the earning rate from the investment, drawing down the resources of banks and ensuring unfair competition etc. The prospect of the impact also is indicated to be severe in the long term following additional policy measures attached to bill purchase which further increase the exposure of bank.

Nevertheless, other variables such as bank size, reserve rate, interest rate, entry capital and number of entrants appear to have statistically insignificant relationship with performances. This is mainly relates to the reduced rate, the price control and limited entry of banks to the system as explained in the previous sections.

With regard to conduct, the behavior of banks:

- On the price aspect, one of the important findings from the quantitative study is that price collusion has not been the norm observed in the Ethiopian banking system. Even if there has been an effort from the private banks system to engage in price collusions, its effect has been not significant but has helped banks to enjoy stable earnings from intermediation business with a liberty to alter their lending prices in a way

to keep their spread constant. Therefore, price remains not a worry to the banks and is not considered as an essential parameter to change performances. In addition, price related measures are discouraged through regulation, different motives of state owned and private banks, substantial size difference, risk taking behavior and market protections.

- Bank product offering in the banking system remains homogenous as a result of lack of patents for bank products and the tendency to get easily copied. Although managers and regulatory staff in general recognized that bank product offerings are homogenous, they consider them as a key source of their competitive advantage
- Service difference has been an important reaction taken by the banks to win market share and build their competitive advantage. This however is driven by both:
 - Internal and intentional motive of the management to attract customers
 - A regulatory direction that encourage banks to compete and differentiate themselves from the move of the market.
- Banks have been promoting themselves through a mix of approaches and consisting of personal selling, customer visit, TV and radio advert, publications (newspapers and magazines), social media, lottery offerings etc. Nevertheless, aggressive promotion attempt through TV and radio presence targeting the mass market is affected by the high investment requirements. This enforced banks to divert there promotion approach to other cost effective media like social medias.
- The banking system in Ethiopia mostly follows a mass market approach addressing the need of both retail and corporate clients with undifferentiated product and marketing approaches. In addition, regulatory measures also discourages differentiation related to market demanding for a homogeneous market reach and ensuring a growth approach through opening large branch networks mainly serving of the retail businesses.
- Despite its high investment requirement, ensuring proximity thorough branch networks remained the strategy of the banks. This is also further exacerbated by the regulator demand.

- Innovation appears to be one of the behaviors determining bank conduct in the Ethiopian banking system. Nevertheless, its level of impact has been challenged to impact the industry performances due to several factors including costs, lack of capacity, low awareness level, easy adoption rate, lack of well developed infrastructure and regulatory barriers.
- Merger and acquisition is not considered as one way of ensuring growth in the banking system. Except on few cases, banks strategy entirely relies on organic growth. This is because of the convenient scenario in the industry to ensure natural growth as well as variation in the market segmentation strategy of banks.
- Lack of well developed market (primary and secondary) has limited banks' choice related to risky activities. Despite the high risk attached to intermediation activity, the banks drive has been to push hard to mobilize local resources from the market and lend it to the needy customers.
- As shown in the quantitative study, the test for the quiet life hypothesis has rejected the existence of a quiet life scenario in the Ethiopian banking industry. Even if the banks are operating in highly concentrated markets, ensuring efficiency through controlling scale of operations and improving their managerial efficiencies remains an important element of the banking business.
- Banks including the small banks don't attempt to respond the threat arising from the competition from big banks through establishing a strategic alliance framework. The alliance observed in the system is usually is derived from the push from the NBE for shared used of resources and information sharing.
- The qualitative study finds some important variables impacting conduct and performance of banks. These include employee retention, top management reputation and relationship with shareholders which impacts customer retention, new customer acquisition and stability of Board and management, respectively.

8.4. Conclusions

Based on the results of the quantitative and qualitative studies, the following conclusions are drawn. Industry concentration relates negatively to performances which is unlike the traditional structure-conduct-performance hypothesis that claims for a positive and statistically significant relationship between bank concentration/market power and performance measures. The findings on the qualitative analyses support the quantitative study findings in that bank collusion is not an easily pursued strategy among banks as long as there is a sizeable difference in bank size, ownership structure as well as notable variation in their mission guiding their business motives. This remains to be an important finding of the mixed approach where collusion is proved to be affected by factors beyond bank sizes. On the other front, unlike the traditional SCP which claims an inverse relationship between bank concentration and competitiveness, both the quantitative and qualitative studies have confirmed a growing competition in the Ethiopian banking sector. Therefore, industry concentration is explored to be a less strain towards competition as long as banks face limited resources such as foreign currency and deposit in the market. The competition, however, might have different player or remains between among those banks having limited access to those resources, i.e. among the private owned banks as explored in the qualitative study.

The empirical result supports the scale efficiency version of the efficient hypotheses. In addition, the study finds that the source of efficiency for banks is a result not only derived from a competent intermediation business but also relies on their capacity to ensure diversified business mix and institutes a better credit risk management framework. The test for efficiency variation through both parametric and non-parametric tests confirms that there is widely noted efficiency variation among banks operating in the country of which the state owned banks appear on the top of the frontier.

Another relevant finding of the qualitative study is related to investigating the behavior of banks operating in a concentrated market. As identified in the literature such variables as, bank conduct, has been a neglected topic in the traditional SCP hypothesis. This is due to the claim that bank conduct is a

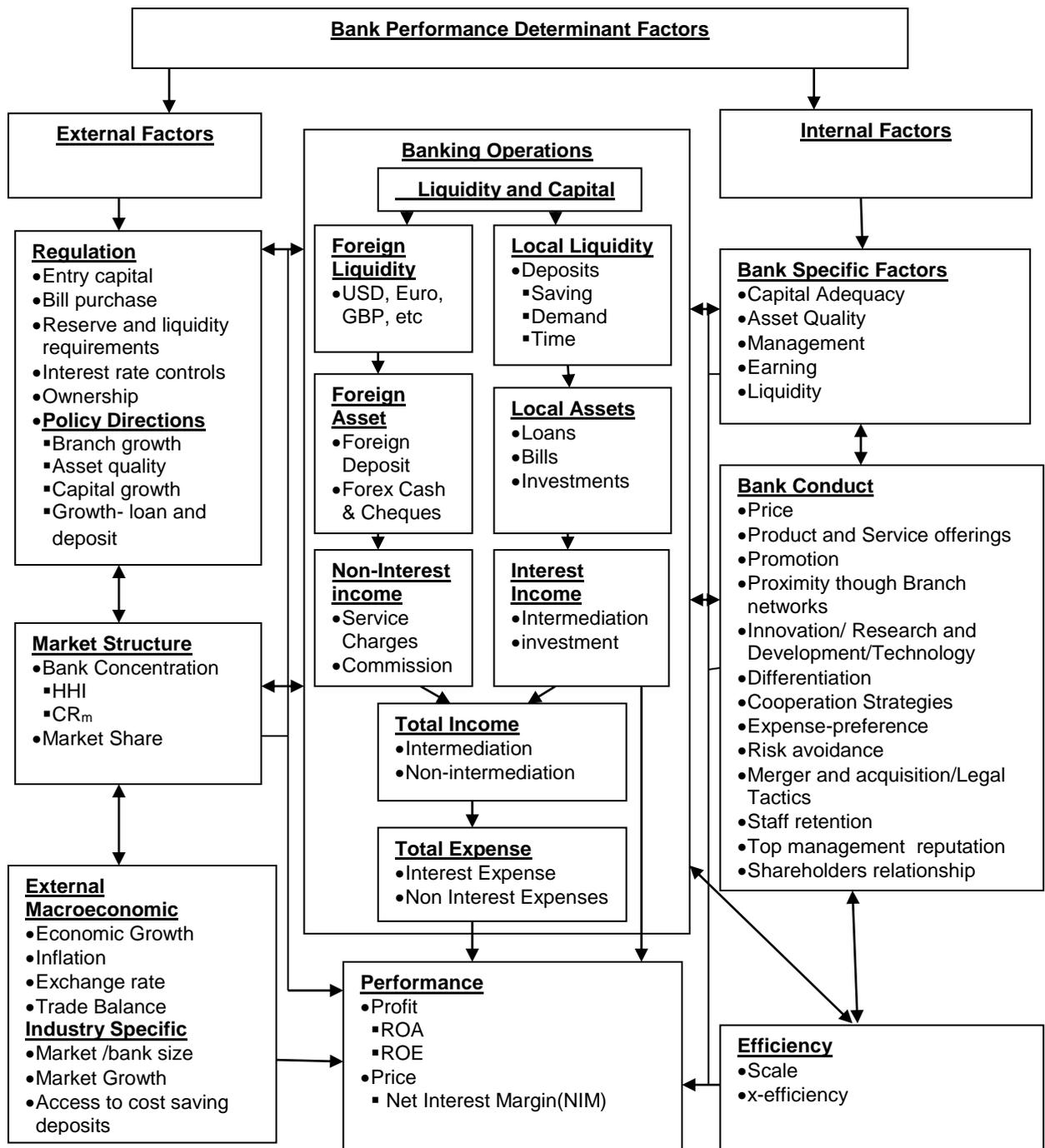
derivative of the industry structure on the one hand and the difficulty to quantitatively test the behavior of banks in the system as the proxy variables are not quantitative by nature or else data is not available as they are not represented in the financial records of banks. The quantitative study, however, investigated that bank conduct is not necessarily a derivative of the industry structure. There are various factors beyond concentration that are mainly from internal, external and regulation that is shaping the conduct of banks in the industry. Such findings from the quantitative study is also supported by the result of the qualitative approach that has witnessed a different behavior of banks than the one suggested by the SCP hypotheses. For instance, given high market concentration, banks in Ethiopia are behaving differently in price competition which remains a less essential parameter to change performances. Service difference has been an important reaction taken by the banks. Banks have been promoting themselves through a mix of approaches, attempted to increase their market share via increasing branch networks. In addition, besides market structure, regulation has been the most important variable affecting banks' performance via encouraging homogenous service offerings, similar bank growth strategies and controlling their asset quality positions. Unlike what is claimed in the SCP hypothesis, the qualitative study shows that organic growth not merger and acquisition is considered as a dominant strategy ensuring growth in the banking system. Bank risk taking behavior also appears in contrast to the hypotheses as banks' behavior towards risk is guided by the development status in the financial market as well as the competition level in alternative markets like foreign banking. The test on quiet life is found to be different from the one suggested by the SCP hypotheses. This has been a different result had a structure based derivative been followed in the study. The qualitative study also explored additional variables determining bank conduct such as employee retention, top management reputation and quality of relationship with shareholders.

Individual statistical analysis on bank specific, external and regulatory factors shows that bank specific factors by large explains the variation in performance of banks. Variables like ensuring income diversification, building resilient capital and liquidity base, maintaining asset quality remained important variables to determine bank performances. In addition, trade balance, economic growth, market growth rate, bill purchase, branch growth and others remained pertinent policy variables

to impact on bank performances. A separate view on the policy direction under the GTP II shows a mixed result where requirements for branch/agents growth and bill purchases have negative effect on performance while others like loan growth, deposit growth, capital increase and asset quality control have positive implications.

Based on the quantitative and qualitative approach findings, the study develops a comprehensive model of bank performance comprising factors from market structure, efficiency, bank conduct, bank specific, external and regulatory factors. The model, therefore, explores that bank performance is a result of the interaction between multifaceted variables from internal and external environments. The conclusion reached in such regard is a result of the test on the key hypotheses arising from the research questions. The testing in the hypotheses has rejected the null hypotheses and accepted that the identified variables have impact on bank performances. Besides, such quantitative hypotheses testing, the qualitative study has explored the fact that non-quantifiable variables determining bank conduct has also impact on performance of banks. After investigating the impact of the proxies in the stated quantitative and qualitative models, the next step has been to find out the level of interactions among the variables in the model. The quantitative study through statistical tests and correlation shows a direct relationship among the proxies used and with the performance models. In addition, the qualitative study has explored the interaction of variables among the models basing on the results of the quantitative study. From the mixed approach, three levels of interactions were constructed: intra-category interactions, cross-category interaction, and network interactions. Therefore, based on the above findings the proposed conceptual framework is adjusted as follows:

Figure 2: Comprehensive Model of Bank Performance- a modification to the Proposed Conceptual Framework



Source: Author's Framework

8.4.1. Interactions of the Variables in the Model

This section focuses on illustrating how different elements of bank performances are interacted with each other, how they had impacts on performance and how this led to better bank performance

8.4.1.1. Intra-Category Interactions

The interaction between explanatory variables that are classified into the same categories has been observed in the correlation among the various variables. For instance, bank specific variables such as capital adequacy ratio and liquidity are positively correlated witnessing the fact that increase in capital level positively relates to an increase in the liquidity status of banks. In addition, an improved in asset quality has less strain on both bank capital adequacy ratio and liquidity status. Similarly, other variables are found to have a significant correlation with each other. On the same ground, the variables probing external and regulatory factors are significantly correlated to each other to explore a meaningful relationship among the variables. On the qualitative aspect, the bank conduct determinants such as price, innovation, promotion, proximity, risk and expense control, employee retention, top management reputation, relationship with stakeholders etc. are explored to have intra-category interactions. This is because the bank conduct parameters constitute a one set of management strategies which are intended to ensure a resilient competition in the market. As investigated in the interview, the management decision mainly relies on optimizing the trade off across its strategy elements. For instance, as pointed out in the interview, the management target from tight expense control has a tendency to minimize long term institutional goals like innovation, promotion, staff retention etc. Therefore, the variables have an intra-category interaction among themselves and are done in a way to optimize long and short-term targets of the banks. Such interaction has been portrayed in the theoretical model by enclosing the variables under their major groupings. For instance, bank specific factors are boxed to incorporate capital adequacy, asset quality, management and liquidity variables. The concept construction and grouping follows the conceptual framework in the literature

intended to separately explore the association between the proxy factors in the group with bank performances.

8.4.1.2. Cross-category interactions

The qualitative result and part of the quantitative study also reveal that a number of interactions occurred across the major conceptual groupings, namely, market structure, efficiency, bank conduct, bank specific factors, external and regulatory factors. These interactions made up the group of cross-category interactions and shows how the aforesaid categories interact with other groups of categories. For instance, the interaction of regulatory factors with structure, bank specific factors and others constitute cross category interactions. Regulatory factors such as entry barriers through setting high entry capital and banning foreign bank entry tended to influence the market structure. Similarly, regulatory factors related to branch growth appear to influence banks' conduct via affecting their growth strategy. Sector related variables such as market growth rate also influences bank specific variables such as level of bank liquidity via affecting the banks potential to mobilize resources from the market. Moreover, growth in economy also has similar influence on bank specific factors by affecting the quality of their assets and liquidity level. Consistent with this, many interviewees indicated that external factors and regulatory variables could have direct impacts on setting bank strategy and so forth. Such interaction has been portrayed in the theoretical model by an arrow moving from the influencer to influenced variable under their major groupings.

8.4.1.3. Network interactions

As the third level of interactions, network interactions involve the relationships between bank performance determinant categories with bank operation. The framework shows that there is a two-way relationship between each category with bank operation. Bank operations interacting with the categories as well as the categories interacting with bank operation could improve bank performances. This shows how banking operation and the categories could make the performances more effective and meaningful. As set in the model, the basic bank intermediation activities involve accepting deposits and making loans directly to borrowers. In

addition, non interest sources of earning also appear to significantly influence performances. The study's findings also reveal that the identified categories could actively interact with other types of resources or financial intermediation activities in terms of attracting deposits, foreign currencies, reducing costs and controlling risks (liquidity and default). The network interaction is displayed in the model with a double arrow interaction with an enclosed framework to reveal banking operation.

8.4.1.4. Consequences

The previous section discussed the three levels of interactions that lie at the heart of the theoretical model of performances. This section addresses the intended consequences or outcomes of those interactions. The consequences of interactions were related to bank performance represented by price and profit measures. The model portrays how the combination and interactions of the categories resulted in improved bank performance. As it can be explored from the network interactions, regulatory variables could lead to allocate resources on low earning investments which obviously affect performance. In addition, external factors such as economic growth affect resource mobilization and allocation decisions which impact on performances. On the other hand, bank specific variables directly impact bank performances. Therefore, improved performance could come from individual categories strengths or the interactions of different categories. Such relationship has been portrayed in the model through arrow revealing the level (direct or indirect) impact performances. Individual category strengths which is related to direct impact is observed through a direct arrow aligning bank performance with the individual categories while the indirect impact is shown by pointing the arrow to the categories they have a direct influence on.

8.5. Recommendations and Policy Directions

The previous sections have discussed key findings of the study in relation to bank performance measurement and modeling. These findings have several implications and recommendations for bank managers, policy makers, and regulators.

Findings from both the quantitative and qualitative studies suggest that the combination or integration of various factors from internal and external environment impact bank performances. This has implication for bank managers in the processes of setting bank strategies and decision making. In addition, bank regulators and policy makers should have considerations to the multi-variables in the model in their attempt to design regulatory directives and macroeconomic policies intended to improve bank performance.

The study also finds that improving the industry concentration through a mix of diversification measures advances the performance of banks in the system. Therefore, the regulatory organ should limit measures that aggravate the concentration of the sector. The recently introduced actions such as merger between state-owned banks need to be carefully considered as it potentially leads to affect the performances of other banks in the system. There should be a merger guideline developed to guide the implication of bank merger on the efficiency, competitiveness and profitability of the industry.

Banks and regulatory moves should be towards improving bank efficiencies which are positively impacted by measures boosting the resource mobilization, credit granting, income diversification and asset quality management capability of banks. The study further suggests that bank managers should be able to effectively manage their resources in response to the changing context such as the economic environment, regulatory and competitive market. In such regard regulators and banks should have a well designed management development programs.

Bank specific factors which are under the control of the management are also major drivers of performances. Banks and regulators should in-place system and

practices can ensure and/or encourage a diversified business mix, a resilient expense management, reliable capital position and a robust credit risk management that can sustain the observed low level of asset quality related problems.

Policy makers should aim to align the banking sector performance to the functioning of the economy so that banks' operation will be closely controlled with the changes in the economy. Ensuring market determined prices, exchange rates, inflation adjusted performances etc. should deserve attention so that banking operations will be guided by the economy policy and models of the government. In addition, policy directions should enhance the contribution of the banking and the financial sector in the economy. In such regard, narrowing the trade deficit through export enhancing and import substitution strategies deserve the policy makers' attention. This should be supported by a market driven exchange regime and pricing system.

Regulatory and banks' direction should also encourage the growth in the industry which supports banks operation by allowing easy access to resources. In addition, resource mobilization strategies should have considerations to cost saving types such as demand and saving deposits which positively impact bank efficiencies and performances

The study finds that some of the regulatory variables are negatively affecting performances. Therefore, regulatory rigidities in some fronts like bill purchases and branch growth requirements need to be flexed. Nevertheless, some of the recently used growth directions such as growth in deposit, growth in loans, capital requirement, setting threshold for asset quality monitoring remain positive to enhance bank efficiency and performances.

Regulators and policy makers should also aim to build a well developed market (primary and secondary) to support the banking business offering liquidity and additional businesses. Unlike the regulatory move for a homogenous banking business, banks should have the liberty to engage in service differentiation, innovation; market differentiation so that the implications could positively contribute to efficiency and performances by exposing banks to new technologies

and new service offerings. It is in such way that the banks remain competitive with each other and with the foreign banks whenever they are allowed to operate in the country.

8.6. Contribution of the Study

8.6.1. Theory

The study has diverse contributions to the literature. First, it has introduced an integrated framework to examine the impact of proxies of determinant factors on bank performances. It has used several elements from internal and external banking environment and finds that different types of explanatory factors joined together tended to better explain the changes in bank performance. The results also provide novel insight into how bank performances may be tested more generally. Second, the findings of the study are distinct from the expected results under the Structure-Conduct-Performance hypothesis which is a widely used theory to examine impact of industry and bank specific scenarios on bank performances. Rejecting the premise of this theory, the study has revealed that collusion is not a random event associated to the size of firms or the existence of factors allowing collusion like entry barriers and protection doesn't mean that banks out rightly prefer to collide. Nevertheless, the result shows that market structure is affected by factors beyond firm size like ownership structure, degree of size difference and variation in the objectives of the firms. A significant variation in size, ownership and missions appear to limit firms' decision to collusion. On the other front, the study explored that competition is not a result to be directly observed from the market structure but is determined by several factors from the industry such as availability of resources, regulations and bank's conduct. Similarly, the relationship between market structure and conduct is found to be unlike the one suggested by the SCP. Bank conduct appears to be distinct from market structure and is shaped by several factors from internal and external environment. Most importantly, regulation is found to have a significant role in shaping the behavior of banks in the market. The effect of several factors result in banks to behave in different way and sometimes in different way than the one presumed by the structural theorists. Third, the study has introduced valuable but neglected factors from the previous structure- performance researches. For

instance, it has examined the effect of regulation on bank performances, which has been commented as one of neglected topics in developing countries' structure-performances studies. The study finds that regulatory factors are more powerful influencers of market structure, banks conduct and internal management decisions. Similarly, the result derived by exploring the conduct of banks suggests that the attempt to determine the conduct of banks from the existing structure will lead to wrong generalization. Similarly, the attempt to look the structure of industry through the study of bank conduct will not also have a meaningful result. Therefore, the study confirms that bank conduct should be separately investigated so as to drive a meaningful result on the behavior of firms within a given market structure situation.

8.6.2. Empirical

The study's contribution to empirical research is also on the high side. The theme of the study has explored one of recent and critical areas of empirical debate witnessing lack conclusiveness in its result. The study contributes to such heated debate by providing evidence from a market structure situation which is well characterized by a high level of concentration. The Ethiopian banking sector which predominantly is locally owned, state-dominated with limited ownership structure and highly regulated appears to be a convenient base to investigate the structure-performance relationship as well as the effect of regulation on several factors. Therefore, targeting concentrated markets like the Ethiopian banking system, the study forwards good evidence regarding the relationship between industry concentration and performance relationship. The empirical result which rejects the SCP theory also confirms that ensuring efficiency remained at the forefront of banks' decision to look for an improved performance. In addition, the empirical test which covered several factors beyond structure and efficiency such as regulation, macroeconomic, sector, and factors from internal decisions of management, remains an exhaustive contribution representing a banking structure of developing economies like the African banking market which is similarly characterized by high concentration.

8.6.3. Policy

As shown in the recommendation part of the study, the outputs explored are important to bank regulators and managers. The study's finding related to efficiency

provides evidence on the major sources of inefficiency and the ways to improve them. This is useful to improve bank organizational performances and direct regulatory efforts intended to influence performances. Structure related problems which are negatively associated to performances are also areas seeking regulatory attention. Hence, regulators needs to observe the trend in the level of concentration in their decisions related to bank mergers, acquisitions, entry of foreign banks etc. Furthermore, bank managers and regulators can also benefit from the result setting the interaction of various variables from internal and external environment with performances. Bank managers also will work on to capitalize on the variables which are under their control and have significant influence on bank performances. The study's assessment on the impact of recently issued policy directives allows regulators depending on their effects to loosen up or further exacerbate the policy directions. Policy makers might also plan to consider measures that can integrate the banking sector contribution to economic performances, establishing well developed financial market as well as allowing banks to diversify earning by offering a range of services. Regulators and policy makers can also use the output of the study to be applied in other financial market players like microfinance and insurances.

8.6.4. Design

This thesis adopts a mixed methods research approach that explores the impact of industry concentration on the Ethiopian banking sector. The study contributes to the methodological development in terms of providing a practical example of how the combination of quantitative and qualitative approaches can offer a more comprehensive picture of the phenomenon than singular methods. The sequential mixed method approach is conducted under an overall conceptual frame showing that the two studies were framed based on similar ideas and structures. By doing so, the study shows that evidence generated from the quantitative and qualitative approaches was easier to compare and cross-check and achieve the purposes of triangulation and complementarity. The triangulation evidence proves that the empirical results of the quantitative study showed that some of the proxy variables representing market structure, efficiency, bank specific, external factors and regulations tended to have impacts on bank performance. Such result witnessed the fact that the hypotheses testing on the stated explanatory variables failed to reject the null hypotheses: the explanatory variables have no impact on bank

performances. Likewise, the qualitative study revealed that the identified relationship in the quantitative study has impact on bank performances. Furthermore, the qualitative study has elaborated the matter from different angles that allowed correcting the deficiency in the quantitative study by forwarding alternative justifications and ensuring consistency. Besides forwarding justifications on relationships and variable choice, the qualitative study has improved the quantitative approach to explore further areas requiring a separate investigation. This obviously enriches the findings of the quantitative study. On the other hand, as shown in the previous section, the quantitative study has become a starting point to design the qualitative study. Furthermore, the qualitative study has pointed out the type and level of interaction among several of the proxy variables and their interaction with performances. This is supported by the qualitative study to further look into the interaction among the proxy variables with performance measures. This will be an encouraging finding to build a comprehensive performance model not only observing the interaction of the proxies with performances but among themselves. Therefore, the integration of the qualitative and quantitative studies with a mixed study approach has addressed several questions that arose with regard to modeling bank performances. For instance, the joint result confirmed that the unexpected results from the quantitative study are not a result of mis-specified models. In addition, in some cases, it has provided a means to improve the constructed quantitative models so as to better characterize bank performance. Therefore, through integrating the two study approaches, the thesis not only benefited to produce a comprehensive model but also provides a good example of how quantitative and qualitative approaches could be integrated to test the impact of various proxies on performances. Therefore, it can be seen that the quantitative and qualitative studies were closely integrated with each other in terms of providing confirmation of some important findings. This enhanced the external validity of the overall research. Apart from the triangulation of results, the combination of the quantitative and qualitative approaches has also the potential to overcome the limitations of adopting a single method.

8.6.5. Modeling

The study has explored that several factors integrated together can better represent the variation in performance of banks. The constructed model,

therefore, framed the level of interactions among the selected variables by looking at the combined effect of performance determinants. In addition to its contribution to create a comprehensive perspective to view on bank performances, the model set in the study are closer to the reality. For instance, the study employed the CAMEL framework, which is a bank performance monitoring tool used by supervisors. This increases the better representation of the model to reality and, hence, enhances its significance in the practical world. It has also clearly pointed out the interactions among variables and separately modeled in areas where there is an interpretation difference. For instance, market structure and efficiency are separately represented in the model so as to avoid interpretation difference. The study also introduced the practical use of parametric efficiency models like the Data Envelopment Analysis (DEA). This will be valuable to bank regulators and bank managers whose efficiency measurement relied on financial ratios that are deficient to measure performances on multi-input and multi-output firms like banks. In addition, the study has provided practical way on how the output from DEA can be used for benchmarking and improvement. Finally, the use of variant efficiency models like cost, revenue and profit allows banks to explore both their revenues and cost side efficiencies.

8.6.6. Measurement and Proxy Variable Setting

The contribution of the study extends to how proxy variables to quantitative and qualitative studies are selected through the use of extensive review and qualitative research approach. Most importantly, the study shows that how omitted variables like regulation and conduct, which are mostly ignored due to measurement problems, can be represented and explored in a study. It has also provided evidence on how the selected variables from literature are improved through qualitative approach. Moreover, the study could be a useful indicator of proxy variable setting, whenever exact measurement of variables is not possible due to data unavailability. For instance, asset quality parameters were measured by the provision to total loans which can exactly be measured by level of non-performing assets. Therefore, the use of surrogates allowed the study to have coverage on key performance determinants. On the other hand, by exploring performances from both price and profit side, the study contributes to the approach on the measurement of bank performances.

8.7. Limitations and Suggested Approaches to Improve the Study

One of the limitations of the study is related to its high reliance on the accounting based output to measure performances and other variables in the model. This obviously is not risk and price (inflation) adjusted. The study attempted to address the limitation by testing the impact of risk taking behavior of banks and inflation on performances measures. The findings show that performance measures are not significantly influenced by inflation but risk behavior has impact on performances. Therefore, the study could be improved via the uses of risk adjusted measures such as risk adjusted RoA, RoE and NIM etc. The other limitation of the study is its use of parametric model like DEA to measure efficiency score of banks. The parametric model results basically are not statistically tested. The study addressed the matter in two ways: one by directly incorporating the efficiency scores in the regression models which is statistically testable and two by applying both parametric and non-parametric tests on the results of the efficiency score. The study, however, can also be improved through the uses of alternative methods like Stochastic Frontier analysis whose result can be statistically tested. The quantitative study has also relied on proxy measures in some of key determinant factors like capital adequacy and asset quality. This is because banks usually do not post their risk adjusted assets and size of problem assets in their financial records. The study, therefore, addresses the matter through the use of surrogate measures. Future, research, however, can improve this study by using direct measures of asset quality and capital adequacy like non-performing loans to total loans and the risk adjusted capital adequacy ratio. Similarly, the qualitative study is based on the input from bank managers and regulatory staff. Nevertheless, banking has diverse stakeholders like employees, customers, shareholders, the government and policy makers, etc. The study chooses bank managers and regulatory staff due to their high involvement in business decisions and regulatory policy development. The study, however, could be improved by adding mainly a perspective of other stakeholders like employees, customers and shareholders which this study also has found to have influence on bank conduct.

8.8. Further Researchable Areas

One of the important relevance of the qualitative study is its contribution to point out further areas of investigation. In addition, from the limitations of the study and unstable variables in the quantitative approach, the study suggesting the following areas for further research:

- One of a recently arose incident (while this study is on progress) in Ethiopian banking industry is merger of state banks which has implications on the existing market structure and competition in the industry. Therefore, the impact of merger of the two state owned banks on performance, efficiency, competitiveness of the industry remains an interesting area for further research.
- Some of the variables in this study such as economic growth have established unstable relationship with performances in the individual, aggregate and rank regression models. The study attempted to triangulate the result from the qualitative approach. Nevertheless, a separate study on the linkage between the banking sector and the Ethiopian economy needs further investigation.
- The study also pointed out that inflation has not been a worry to the banks as they were able to operate at a constant spread between saving and lending rate. In addition, borrowers appear to benefit from a reduced real lending rate in times of high inflation. Nevertheless, the cost of high inflation, which consistently draws a negative real saving rate, affects the depositors. Therefore, the effect of a negative real interest rate on the saving habit of depositors remains a suggestion for further research. In addition, this allows improving this study by integrating depositors' side performance factors whose view is not addressed in this study.
- Finally, some of the policy and regulatory factors such as bill purchases, branch growth rate, agent banking reach, deposit and loan growth rate, capital requirement and asset quality appear to function for relatively long period after the completion of this study (at least up to the end of GTP II period). Therefore, academic research should follow on the impact arising from such policies on performance, efficiency and competitiveness of the sector in the forthcoming.

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ANNEX

Annex 1: Ethical Clearance

Graduate School of Business Leadership, University of South Africa, PO Box 392, Unisa, 0003, South Africa
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E-mail: sbl@unisa.ac.za Website: www.unisa.ac.za/sbl

SCHOOL OF BUSINESS LEADERSHIP RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

21 July 2016

Ref #: 2016_SBL/DBL_006_FA
Name of applicant: Mr BL
Tesfaye
Student #: 78463963

Dear Mr Tesfaye

Decision: Ethics Approval

Student: Mr BL Tesfaye, teskubl@gmail.com, +25191 1446356

Supervisor: Dr Abdurezak, abdurazak.mohammed@aaau.edu.et, +25191 1238889

Project Title: The impact of industry concentration on performance: the case of Ethiopian banking sector

Qualification: Doctorate in Business Leadership (DBL)

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee:
Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 20/07/2016.

The proposed research may now commence with the proviso that:

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
- 2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.

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- 3) An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
- 4) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

Kind regards,



25/04/2016

Prof R Ramphal

Chairperson: SBL Research Ethics Committee

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This is to certify that i have made professional language editing on the thesis titled, **'THE IMPACT OF INDUSTRY STRUCTURE ON PERFORMANCE: EXPLORING A COMPREHNSIVE MODEL OF BANK PERFORMANCE: THE CASE OF ETHIOPIAN BANKING SECTOR'** submitted for Doctor of Business Leadership (DBL) at the University of South Africa (UNISA) by Tesfaye Boru Lelissa.



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Annex 2: Examples and Summaries of Reviewed Literature

No	Articles	Methodology	Variables	Tests/Hypothesis tested	Findings	Study zone
1	Simrlock 1985	Based on Weiss 1974 $\pi = a_0 + a_1$ $MS + a_2 CR + a_3 MSCR + \sum a_i Z_i$ $a_1 > 0, a_2 = 0$ - efficiency $a_1 = 0, a_2 > 0$.. concentration a_1 and $a_2 > 0$ —all firms in concentrated market earn monopoly profit with additional test $a_3 > 0$ —concentration, $a_3 > 0$ or = 0....efficient data 1973-78 for over 2700 unit state banks	Market share, three bank deposit concentration ratio, total market deposits, %ge growth in market deposit, demand deposits to total deposit, asset, holding company affiliation, multibank holding companies	Restriction $a_1 = a_3 = 0$ $a_2 = a_3 = 0$ $a_3 = 0$ without parameter restrictions Quandits switching of regimes for discrete concentration magnitude of MS and CR done via derivative of π w.r.t.mean of MS and CR	There is no relationship between concentration and profitability rather between bank market share and bank profitability	
2	Alton Gilbert, 1984	review of literature/previous works			Regulations is not well analyzed in previous studies	
3	Deepti Sahoo and Pulak Mishra 2012, SCP of Indian Banking Sector	Khambampati 1996- simultaneous eqn approach $S f(C,P), F = (s,p) P = f_3 (S,C)$ Adding lagged variables Data of 59 private foreign and public banks from 1999/00 to 2008/09 Panel unit root test VIF	Market share- proxy for market structure Selling intensity for conduit ROA- Performance0 MS F(BANK SIZE, lagged market size, lagged selling intensity, lagged ROA And nature of ownership Selling expenses to income Natural log pf fixed asset- asst base Natural log of incme-market size	Is the SCP r/p unidirectional?	Multidirectional r/p exists Nature of ownership has effect on bank performance- private banks There is strong r/p scp	Country specific, INDIA

4	Idries M. Al- Jarrah AND Hisham Gharaibeh 2009 The Efficiency cost of market power in banking: a test of the 'quiet life' and related hypothesis in the Jordan's Banking Industry	Eff-f(CON, XI) +ERROR	HHI Frontier approach for efficiency Total assets/ equity Non-deposit borrowing to total asset, Size- total assets Time trend16 banks in Jordan- 2001-05 (80 observations)		Positive and insignificant r/p between market power and efficiency- fur yo lower pressure from competition to increase the quality of banking services, together with lower monitoring and screening cost	Country specific Jordan
5	Mahmet A. Civelek AND Mohamed W. Al-Alami- An Emperical investigation of the Concentration- Profitability Relationship in the Jordanian Banking System-1991	Exploratory emperial testing Pro=f(MC,MS,MG,BS,BR) Cross section date from 1984-88	ROA, ROW MS- Deposit MG- ANNUAL GROWTH BS- ASSET BR- Risk -loan to deposit	SCP and EFH	Doens;t concluded	Country specific Jordan
6	Schweiger and Mc gee 1961	To the bank;s literature				
7	Market Structure and Performance in the GCC Banking Sector: Evidence from Kuwait, Saudi Arabia and UAE-2005	P= F(CR,MS,MSCR)	Roe, HHI, RISK(LOANS to ASSETS), staff expense to total assets, rate of deposit growt, MS= ASSET, mscr= ms*hhi		SCP- holds for Sudi but the EFH- ofr Kuwait and UAE	Panel of countries
8	Samuel Yaw Akomea and Michael Adusei Bank Recapitalization and Market Concentration in Ghna's Banking INDUSTRY: A hhi Analysis- 2013	Used HHI index to measure concentration- 2003-2010	Deposits and net advances	Concentration level		Country specific- Ghana
9	Cetoreli 2000					

10	Ghulam Ali Bhatti and Haroon Hussain- Evidence on the SCP Hypothesis in Pakistani Commercial Banks- 2010	$P=f(\text{cr,ms, control variables})$ Data 1996-2004	Bank size- asset Deposit- market size Capital to asset- market risk Loan to deposit- lending risk, liquidity- loans to assets, market growth	SCP VS EFH	Accepted SCP Leading banks are still enjoying the state of monopoly	Country Specific- Pakistan
11	Joaquin Maudos- Market Structure and Performance in Spanish banking using direct measure of efficiency-1998					Country specific Spain
12	Seed Al- Muharrami- The Competition and Market Structure in Saudi Arabia Banking- 2009	Detailed description for concentration measures- k-firm and HHI---1993-2006 Used H-statistic of Panzar and Rose to estimate monopoly power	Revenue to total asset, ROA, personal expense to employees, capital expenses to fixed assets, annual interest expense to own funds, provision to total assets, bank total assets , branch of each bank to total number of branches	Competitive environment test SCP	Saudi is moving from moderately concentrated to less concentrated position na dh-static shows that Saudi banks operate under monopolistic competition....but no estimate on performance implications	Country Specific - Saudi
13	Hall and Tideman 1967	List of six desirable properties for measures of concentration				
14	Molyneux 1996	37 studies used three bank deposit concentration				
15	Shirmal Perera, Michael Skully and MY Nguen, Market Concentration and Pricing behavior of Sri Lankan Banks2012	$LN \text{ Nim}=f, \ln(\text{MC+MS+EQ+} \text{COST+}$ SIZE+STATE+BFGS+ $\text{GDP+SCM+MMR})$ USED K-FRM concentration- loans and deposits, included regulatory measures Considers ownership 1990-2008 panel data with 175 observations	Dependent –NIM Concnetraton, market share, equity capitalization, cost structure, bank size, dummy for state woned banks, degree of restrictions in banking and financial sector, demand for	Banking and fiancé grading scale score from the index of economic freedom- BFGS SCP AND ESH	Sirilankans banks interest margin are not significantly associated with bank market concentration	Country Specific- Sri lanka

			laons, access to capital market funding, market interest rate			
16	Brewer and Jackson 2004					
17	More and Nagi 2003					
18	Perra 2010					
19	SHAFFER 2004					
20	Miles 2005					
21	Thao Ngoc Nguyen and Chris Stewart, Concentration and Efficiency in the Vietnamese banking system between 1999 and 2009 a structural model approach-2013	48 banks for 1999-2009 panel data Profit= f(ms, cr, zi) Concentration ratio is used,	ROA, log revenue/total assets. Long interest income/total assets-dependent Ms- loans, deposit, assets, Risk- capital to asset, loan to deposit Bank size- log ta Bank branches		Result doesn't support either scp orEH. However business strategies of Vietnamese banks during the period were focused on raising capital, loans, assets, deposits, branch networks and reducing NPLS.	Country specific Vietnam
22	Millin Sathye 2005, Market Structure and Performance in Australian Banking-2005	DEA- Input capital labor, outputs loans, deposits and number of branches Three year data 1994-96, of 24 banks , pooled data unbalanced Scale efficiency only is taken PRICE/PERF= F(CR,MSS,EFF,ZI)-no sector specific and macro variables	Independent – interest margin, ROA Dependent, C4 and HHI loans, MAKERT SHARE DEPOST, CAR, loan to deposit , log asset for bank size	The four hypothesis	Rejected the efficiency hypothesis and the two intermediate hypothesis but there is strong evidence to support the SCP and declined allowing merger of four big banks is likely to decrease the level of completion in the banking system and hence cannot be justified on the efficiency ground/.	Country Specific-Australia
23	Simeon Papadopoulos, Market Structure , Performance and Efficiency in European Banking-2004	Stochastic frontier analysis for efficiency Profit= f(CN,NS,X-EFF, S-EFF Data of one yara only 1998	Output- loans and securities Inputs- wage expense, depreciation expense to total fixed assets Dependent- gross	Tests of the four hypothesis	The efficient structure doesn't help in explaining the variability of bank profits. Market structure variables, share of total assets and three firm concentration ratio are	Panel of countries- Europe-pooled

			profit rate (gross profit to total income) Ms- total asset Three firm concentration ratio x-eff. S-eff, GDP-per cap difference		statistically significant but they are negatively related with bank profits,	
24	Aktham I. Maghyereh, Basel Awaratni – The effect of market structure, regulation and risk on bank efficiency: evidence from the gulf cooperation council of ministeris-2014					
25	Joaquin Maudos, Market Structure and Performance in Spanish banking using direct measure of efficiency- 1998	Stochastic frontier analysis- data used 1990-93 with 53 observations- pooled data- PERF= F(CR,MS, ASSETS, loans/assets, growth in market deposit, inefficiency(half normal, normal-truncated, exponential)	outputs- deposits, loans prices and inputs Price of labor expense to number of employees, finalcial expense to depo- sits, capital expense to fixed assets ROA, ROE	The four hypothesis	Supported the modified efficient structure hypothesis, efficiency positively affects profitability although the market power, reflected in the market share. Rejected the collusion hypothesis. SCP, BANK regulatory decisions based on concerns for their impact on changes in concentration may be inappropriate and should instead focus on bank efficiency	Country specific- Spain with pooled data
26	Nikos Ioanni Schiniotakis, Profitability Factors and Efficiency of Greek Banks-2012	Data 2004-2009, multiple linear regression analysis used	Independent- roe, equity to loans, expense to income, provision to loans, size , personnel to branches,	Efficiency proxy by cost to income	Analysis done for both commercial and cooperative banks, type of bank plays important role in profitability, roa is associates with well capitalized banks with liquidity and cost efficiency.	Country specific- Greek
27	Shiow-Ying Wen and Jean Yu, Banking	2003-10 data in 18 emerging countries poling time series and	z-score (bank stability) ROA PLUS	Bank stability ans structure link	Concentration measurement can be a	Pooled- China, Chile,

	Stability, Market Structure and Financial System in Emerging countries-2013	cross section data z-score= f (CR,Finacial deepening indexes, bank cxs) hhi loans, deposits and assets	eq/ta, market capitalization, stock/gdp, bond/gdp etc) bank cxs- non-interst income to total income, NPLS		proxy measure of bank stability, performance of banks depends on the existing structure, polices supporting financial deepening or promoting bank liquidity might not necessarily improve bank stability	Malaysia, Indonesia , Taiwan, south Africa, Peru, Hungary Argentina Philippines, India, Korea Thailand, turkey, Mexico, brazil, Colombia, Czech rep,
28	Philip Molyneux , Determinants of European Bank profitability, 1992	Pooled data 1986-89 Multiple regression, unbalanced longitude data of 671,1063,1371,1108, banks	Profit before taz and profit after tax over equity, ROA, NPBT+ staff expenses AS percent of total assets, npat+ staff expenses+ provision for loa loasse as percent of total asset Independent- gov ownership, concentration, interest rate, money growth, capital to total asses, liquid assets to total assets, CPI,staff expenses as percent of total assets	Expense preference theory Edwards- Heggsted- Mingo risk avoidance hypothesis SCP	Concentration shows a positive, stastically significant correlation wih pre-tax return on asses which is consistent with the transitional SCP paradigm	Panel of countries
29	Ines Ayadi, Abderrazak Ellouze, Market Structure and Performance of Tunisian Banks-2013	DEA Model for scale and x- efficiency ROA=F(CONC,MS,SEFF, SFF,LOGTA,OWNERSHIP) CON- HHI 1990-2009	Input – LABOR, PHYSICAL CAPITAL, FIANCIAL CAPITAL Output- loans, securities	SCP RELATIVE MARKET POWER EFFICIENCT STRUCTURE (SEFF, SEFF)	Scp not verified but efficiency determines profitability	Country specific- Tunisia

30	Chortares 2009					
31	FU and Hefferman 2009					
32	Anthony H.Tu, Shen-Yuan Chen, Bank Market Structure and Performance in Taiwan Before and after the 1991 Liberalization-2000	Profit= (CR, MS, ZI) Pooled time series data 1986-1999	ROE is used, CR4 DEPOSIT AND LOANS, MS- LOANS AND DEPOSITS, capital to asset, loan to deposit, number of branch, new and old banks,	EFH and SCP	Pre- liberalization period rejected the two hypothesis, hence presence of a regulation induced quiet life type of market structure is witness, for the post 1991 period, the result tend to support the efficiency hypothesis.	Country specific-Taiwan
33	Cletus C. Agu, Analysis of the determinants of the Nigerian banking system's profits and profitability performance, 1992	Profit= f(market structure, policy, demand) Time series data 1970-1981	Market structure- assets, deposit concentration ratio and number of bank offices Policy- time plus saving deposit to total deposit, loans to deposit Demand- per capital income	Bank market structure has significant influence on bank profit	Market structure has no significant influence on performance, but number of bank offices have significant association with profit. The policy and demand factors are important determinants of profitability .	Country specific - Nigeria
34	Belaid Retab, Hosseing Kashani, Lamaia obey, Ananth Rao, Impact of Market Power and Efficiency on Performance of Banks in the Gulf Cooperation Council Countries-2010	RoA=F(CR,MS,MSCR, RISK,expense ratio,eff) HHI and MS-deposit,loans,asset 2001-05 (pooled data)unbalanced-272 observations DEA	RISK- loan to total assets, capital to total asset, Expense ratio, staff expenses to total assets, cost to income Dea- input- capital and labor Output- loans ,deposits, branches	There is positive relationship between performance and market structure There is positive r/p b/n performance and efficiency There is positive relationship between firm specific risk attributes and performance There is a relationship	The study results doesnot support SCP AND PERFORMAMNCE IS DRIVEN BY EFFIINCY UAE conventional banking market is not concentrated, while Saudi conventional banking is moderately concentrated , banking markets in Oman and Qatar are concentrated	POOLED COUNTRIES- Saudi Arabia, Kuwait, UAE, Bahrain, Oman , Qatar

				between specific inter bank cost difference and performance There are characteristics which differentiate UAE and non-UAE GCC banks		
35	Demsetz, 1973					
36	Abdus Samad, Market Structure, Conduct and Performance : Evidence from the Bangladesh Banking Industry, 2007	44 commercial banks for 199-2001, ANNUAL AND pooled data separately analyzed.. Prof=f(CR, MS,ZI) Cr3 for assets and deposit MS- ASSETS, DEPOSITS	CAOITAL TO ASSET, LOAN TO DEPOSIT, ASSETS, OWNERSHIP	Scp VS esh	Rejected SCP other bank specific factors are significant to explain performance— recommednde for more liberalization effort....	Country specific- Bangladesh
37	D.M.Lloyd- Williams and Phil Molyneux, Market Structure and Performance in Spanish Banking, 1994	Separate annual and ppoled data from 1986 to 1988 for 92 banks 1988 56 banks for 1986 and 1987 Prof-f(CR,MS, ZI)	Roa Cr3 deposit and asset Ms,capital to asset, loan to deposit, asset, ownership, , seven big banks as dummy	SCP VS ESH	Accepted SCP, other variables are also significant to explain performance	Country specific - Spain
38	Ali Mirzaei, Tomoe Moore, Guy Liu, Does Marekt structure matter ob bank's performance and stability? Emerging vs advanced economies- 2013	Data from 40 countries of 1929 banks- panel data 1999-2008 Prof= f(ms, cr,zi) z- bank specific, country specific and overall financial structure factors	CR5 x-efficiency and scale efficiency, interest rate spread, totoal asset, capital to asset, overhead to total asset, off balance sheet to total asset, bank age, ownership status, domestic credit to GDP, stock market turnover ratio, inflation and real GDP	SCP vs ESH Concentration fragality vs concentration stability	Support EMH for developed but doesn't get support for the two hypothesis in the emerging economies. The SCP appears to exert a destabilizing effect on advanced banks, suggesting that a more concentrated banking system maybe vulnerable to financial instability, however the RMP seems to perform a stabilizing effect in both economies.	Panel of countries

			growth			
39	Park and weber 2006- korea					
40	Tregenna 2009 america					
41	Claeys and Vander vennet 2008					
42	Xiaoqing(Maggie)FU, Shelagh Hefferenan, The Effects of reform on China;s Bank structure and performance-2007	$P=f(\text{CR,MS,XEFF,SEFF, Control})$ WITH STOCHASTIC frontier 14 banks 1985-1992 and 1993-2002 pooled data	ROA, Roe, CR4-deposit HHI –DEPOSIT XEFF – OUTPUT- loans, deposits, investment, non- interest income--- inputs price- labor, capital, borrowed funds SEFF Control- ownership, average income per person, time trend, loans to asset, equity to assets	SCP vs EFH Quiet life	Support of the relative market power hypothesis in the earlier period. the reform has little impact on the structure of the Chinese banking system...but joint stock banks appear more efficient. No evidence to support the quiet life.	Two period analysis- country specific – china
43	Hicks 1935					
44	Mendes and Rebelo 2003 portugese					
45	W.Scott Frame and David R. Kamerschen, The profit-structure relationship in legally protected banking markets using efficiency measures- 1997	$\text{Prof}=f(\text{MS,XEFF,ASSETS, CAPITAL,HOLDING, BRANCH, GROWTH,PCINC})$ 1990-94 PANEL DATA 208 Georgia banks		SCP vs EFH	ACCEPTED scp- banks that are shielded from completion by severe interstate branching restrictions have market power.	Region specific- Georgia
46	Maurico Jara-Bertin, Jose Arias Moya, ARTURO Rodriguez Perales, determinants	$\text{PROF}=F(\text{CON, CTRL})$	Non-interst to total asset Log loans, loan to tal asset, liquidity,	diversification of income has effect on performance. bank	All control variables have significant effect on performance, including concentration hence is	panel of countries- Latin America

	of Bank Performance: evidence for Latin America		income, CAR, deposit to total asset, expense to asset, inflation, annual growth rate of GDP	concentration, liquidity, credit risk have effect on performance	supporting SCP	
47	Shrimal Michael Skully, Wickramanayake, Bank Market Concentration and interest spreads: South Asian Evidence -2010	$NIM=F(LN MC, MS, EQ,COST,SIZE, STATE,BFGS ,GDP,SMC,MMR)$ Data 1992-2005-120 south asian banks---with 1226 bank-year observations panel data		There is interest deviation in interest rate margins which will be attributed to market concentration	Donks with larger loan and deposit shares operate with higher interest margins-hence support effect of SCP on interest margin	Bangladesh, India ,Pakistan, Sri Lank
48	Paul S. Calom and Gerald A. Carlino, The concentration/conduct relationship in bank deposit markets	Deposit rare=f(CR-3, CHINC, INC,MIG, AGE,WAGE, NE,MW,W)	Cr-3- deposits, Chinc-loancal income growth, INC- personal income, age- >45, MIG- migration, WAGE	SCP only	Statistically significant but small effect on market deposit rate- hence rejected SCP- strategic conduct is not limited to concentrated markets	US money deposit market
49	Georgios e. Chortareas, Jesus G. Garza-Gracia, Claudia Girardone, Competition, Efficiency and Interest Rate margins in Latin American Banking-2012	$NIM=F(Lag NIM, HHI,MS,ESX,ESS, FIRSM SPECIFIC, COUNTRY SPECIFIC VARIAB;ES)$ GMM- 1700 banks for 1999-2006= cross section HHI	Firm and market specific- cap to asset, loan to asset, loan loss reserve, Macroeconomic-exchange rate, CPI,GDP, INT	SCPvs effect ON INTERST MARGIN	The concentration index and market share have little or no influence on interest rate margins. Greater efficiency and competitive markets result in lower spreads.	Panel of countries- Latin America

Annex 3: Cost Efficiency- Constant Return Scale

DMU	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
CBE	0.862	0.631	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	1.000	0.811	1.000	1.000	1.000	0.959
CBB	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.942	0.923	0.705	0.933	0.862	0.742	0.947
AIB	0.719	0.715	0.712	0.737	0.879	0.795	0.768	0.609	0.697	0.856	0.724	0.655	0.849	0.831	0.903	0.949	0.880	0.781
DB	1.000	0.751	0.784	0.864	0.854	0.860	0.858	0.730	0.718	0.842	0.702	0.639	0.845	0.810	0.887	0.843	0.826	0.813
BOA	0.806	0.789	0.814	0.652	0.706	0.833	0.811	0.763	0.738	0.888	0.746	0.790	0.795	0.808	0.829	0.862	0.739	0.786
WB	0.856	0.667	0.666	0.717	0.819	0.893	0.897	0.764	0.730	0.985	0.726	0.827	0.807	0.855	0.969	0.820	0.912	0.818
UB	0.815	0.810	0.833	0.958	1.000	0.945	0.841	0.693	0.842	0.916	0.791	0.717	0.822	0.850	0.917	0.924	0.890	0.857
NIB		1.000	0.951	1.000	0.948	0.973	1.000	0.855	0.840	0.932	0.821	0.803	0.852	0.895	1.000	1.000	0.961	0.927
CBO								0.606	0.683	0.689	0.875	0.673	0.648	0.683	0.799	0.973	1.000	0.763
LIB									0.272	0.529	0.817	0.741	0.770	0.785	0.933	0.835	0.896	0.731
OIB											0.380	0.556	0.747	0.665	0.862	0.744	0.792	0.678
ZB											0.752	0.701	0.966	0.789	0.979	0.859	0.914	0.851
BUNNA												1.000	1.000	1.000	0.944	0.935	0.869	0.958
BIRHAN												0.832	0.697	0.749	0.906	0.861	0.795	0.807
ABAY													0.774	0.758	0.794	0.843	0.827	0.799
ADDIS														1.000	0.860	0.907	0.898	0.916
ENAT																0.912	0.853	0.883
DGB																0.889	0.534	0.712
Average	0.865	0.795	0.845	0.866	0.901	0.912	0.897	0.780	0.752	0.864	0.778	0.777	0.833	0.812	0.907	0.890	0.852	0.843
Public	0.931	0.816	1.000	0.969	0.961	0.758	0.966	0.931	0.871	0.953								
Private	0.839	0.789	0.793	0.821	0.868	0.883	0.862	0.717	0.690	0.829	0.733	0.745	0.813	0.820	0.899	0.885	0.849	0.814
Middle	0.839	0.789	0.793	0.821	0.868	0.883	0.862	0.736	0.761	0.903	0.751	0.739	0.828	0.842	0.917	0.900	0.868	0.829
Small								0.606	0.477	0.609	0.706	0.750	0.800	0.804	0.885	0.876	0.838	0.735
CBE	0.862	0.631	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	1.000	0.811	1.000	1.000	1.000	0.959
DMUs	7	8	8	8	8	8	8	9	10	10	12	14	15	16	16	18	18	11.353
Efficient DMUs	2	2	2	3	3	2	3	2	2	2	2	1	2	2	2	2	2	2.118
Standard Deviation	0.103	0.139	0.128	0.145	0.106	0.079	0.093	0.147	0.205	0.150	0.160	0.135	0.104	0.096	0.066	0.067	0.110	0.086
Ef. Gap CBE-Private	0.022	-0.15	0.207	0.179	0.132	0.117	0.138	0.283	0.310	0.171	0.267	0.252	0.187	-0.01	0.101	0.115	0.151	0.145

Annex 4: Cost Efficiency- Variable Returns Scale (VRS)

Cost Efficiency- Variable Returns Scale (VRS)																		
DMU	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
CBE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
CBB	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.815	0.949	0.869	0.759	0.964
AIB	0.721	1.000	0.723	0.739	0.879	0.810	0.846	0.784	0.892	0.912	0.854	0.878	0.953	0.990	1.000	1.000	1.000	0.881
DB	1.000	0.973	0.789	0.867	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.949	1.000	1.000	0.960	0.888	0.881	0.959
BOA	0.811	0.855	0.820	0.652	0.757	0.885	0.835	0.946	0.925	1.000	0.944	1.000	0.961	0.916	0.829	0.862	0.742	0.867
WB	0.864	0.856	0.687	0.733	0.819	0.894	0.903	0.879	0.926	1.000	0.804	1.000	0.878	0.978	0.971	0.822	0.917	0.878
UB	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.693	0.866	0.923	0.856	0.874	0.953	0.969	0.918	0.925	0.893	0.934
NIB		1.000	1.000	1.000	0.948	0.993	1.000	0.959	0.973	1.000	0.975	0.981	0.942	1.000	1.000	1.000	0.963	0.983
CBO								1.000	1.000	1.000	0.916	0.715	0.668	0.737	0.811	0.980	1.000	0.883
LIB									1.000	1.000	0.868	0.818	0.804	0.844	0.959	0.859	0.918	0.897
OIB											1.000	0.642	0.749	0.798	0.880	0.749	0.798	0.802
ZB											1.000	0.823	0.971	0.918	1.000	0.867	0.937	0.931
BUNNA												1.000	1.000	1.000	0.985	0.950	0.894	0.972
BIRHAN												1.000	0.705	0.761	0.949	0.895	0.827	0.856
ABAY													1.000	0.780	0.855	0.872	0.852	0.872
ADDIS														1.000	1.000	1.000	1.000	1.000
ENAT																0.979	0.980	0.979
DGB																1.000	1.000	1.000
Average	0.914	0.961	0.877	0.874	0.925	0.948	0.948	0.918	0.958	0.983	0.935	0.906	0.906	0.907	0.942	0.918	0.909	0.925
Public	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.907	0.974	0.935	0.879	0.982
Private	0.879	0.947	0.837	0.832	0.900	0.930	0.931	0.894	0.948	0.979	0.922	0.890	0.891	0.907	0.937	0.916	0.913	0.909
Middle	0.879	0.947	0.837	0.832	0.900	0.930	0.931	0.877	0.930	0.972	0.905	0.947	0.948	0.975	0.946	0.916	0.900	0.916
Small								1.000	1.000	1.000	0.946	0.833	0.842	0.855	0.930	0.915	0.921	0.924
CBE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DMUs	7	8	8	8	8	8	8	9	10	10	12	14	15	16	16	18	18	11.353
Efficient DMUs	4	5	4	4	4	4	4	4	5	8	5	6	4	5	5	5	5	4.765
Standard Deviation	0.116	0.066	0.137	0.147	0.096	0.074	0.074	0.111	0.052	0.035	0.072	0.119	0.117	0.100	0.064	0.075	0.086	0.060
Ef. Gap CBE-Private	0.121	0.053	0.163	0.168	0.100	0.070	0.069	0.106	0.052	0.021	0.078	0.110	0.109	0.093	0.063	0.084	0.087	0.091

Annex 5: Cost Efficiency- Scale Effect

DMU	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
CBE	0.862	0.631	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	1.000	0.811	1.000	1.000	1.000	0.959
CBB	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.942	0.923	0.866	0.983	0.992	0.977	0.981
AIB	0.998	0.715	0.985	0.998	1.000	0.981	0.907	0.777	0.782	0.938	0.847	0.746	0.891	0.840	0.903	0.949	0.880	0.891
DB	1.000	0.772	0.993	0.996	0.854	0.860	0.858	0.730	0.718	0.842	0.702	0.673	0.845	0.810	0.924	0.949	0.937	0.851
BOA	0.994	0.923	0.993	1.000	0.934	0.941	0.971	0.806	0.798	0.888	0.790	0.790	0.827	0.882	1.000	0.999	0.995	0.914
WB	0.990	0.779	0.969	0.979	1.000	0.999	0.993	0.869	0.789	0.985	0.903	0.827	0.919	0.875	0.999	0.998	0.994	0.933
UB	0.815	0.810	0.833	0.958	1.000	0.945	0.841	1.000	0.972	0.992	0.924	0.820	0.862	0.877	0.999	0.999	0.996	0.920
NIB		1.000	0.951	1.000	1.000	0.980	1.000	0.892	0.863	0.932	0.842	0.818	0.904	0.895	1.000	1.000	0.998	0.942
CBO								0.606	0.683	0.689	0.955	0.942	0.970	0.927	0.986	0.993	1.000	0.875
LIB									0.272	0.529	0.941	0.906	0.958	0.931	0.973	0.972	0.976	0.829
OIB											0.380	0.866	0.997	0.833	0.979	0.994	0.992	0.863
ZB											0.752	0.852	0.995	0.859	0.979	0.991	0.975	0.915
BUNNA												1.000	1.000	1.000	0.959	0.984	0.971	0.986
BIRHAN												0.832	0.989	0.984	0.954	0.962	0.961	0.947
ABAY													0.774	0.972	0.929	0.966	0.972	0.923
ADDIS														1.000	0.860	0.907	0.898	0.916
ENAT																0.932	0.871	0.901
DGB																0.889	0.534	0.712
Average	0.951	0.829	0.966	0.991	0.973	0.963	0.946	0.853	0.788	0.879	0.836	0.858	0.924	0.898	0.964	0.971	0.941	0.914
Public	0.931	0.816	1.000	0.969	0.961	0.838	0.992	0.996	0.989	0.970								
Private	0.960	0.833	0.954	0.989	0.965	0.951	0.928	0.811	0.735	0.849	0.804	0.839	0.918	0.906	0.960	0.968	0.934	0.900
Middle	0.960	0.833	0.954	0.989	0.965	0.951	0.928	0.846	0.820	0.930	0.835	0.779	0.875	0.863	0.971	0.982	0.967	0.909
Small								0.606	0.477	0.609	0.757	0.900	0.955	0.938	0.952	0.959	0.915	0.807
CBE	0.862	0.631	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	1.000	0.811	1.000	1.000	1.000	0.959
DMUs	7	8	8	8	8	8	8	9	10	10	12	14	15	16	16	18	18	11.353
Efficient DMUs	2	2	2	3	3	2	3	2	2	2	2	1	2	2	2	2	2	2.118
Standard Deviation	0.078	0.134	0.056	0.015	0.053	0.048	0.067	0.137	0.214	0.156	0.172	0.093	0.072	0.064	0.041	0.034	0.109	0.091
Ef. Gap CBE-Private	-0.09	-0.20	0.046	0.011	0.035	0.049	0.072	0.189	0.265	0.151	0.196	0.157	0.082	-0.09	0.040	0.032	0.066	0.059

Source: Author's Computation

Annex 6: Revenue and Profit Efficiencies of Ethiopian Banks 1999-2015

DMU	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
Revenue Efficiency- Constant Return to Scale																		
Average	0.898	0.856	0.865	0.893	0.947	0.924	0.909	0.971	0.910	0.896	0.815	0.755	0.780	0.831	0.906	0.888	0.866	0.877
Public	0.992	0.948	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.989	0.880	0.954	0.854	0.944	0.919	0.837	0.960
Private	0.861	0.825	0.820	0.857	0.929	0.899	0.878	0.963	0.888	0.869	0.781	0.734	0.753	0.828	0.901	0.884	0.869	0.855
Middle	0.861	0.825	0.820	0.857	0.929	0.899	0.878	0.957	0.970	0.948	0.731	0.746	0.752	0.859	0.922	0.923	0.879	0.868
Small								1.000	0.643	0.634	0.854	0.722	0.755	0.804	0.885	0.860	0.864	0.802
CBE	0.983	0.897	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DMUs	7.000	8.000	8.000	8.000	8.000	8.000	8.000	9.000	10.000	10.000	12.000	14.000	15.000	16.000	16.000	18.000	18.000	11.353
Efficient DMU	2.000	3.000	4.000	3.000	5.000	3.000	3.000	7.000	5.000	3.000	2.000	2.000	2.000	3.000	3.000	4.000	3.000	3.353
Standard Deviation	0.105	0.141	0.153	0.126	0.078	0.088	0.088	0.085	0.163	0.150	0.132	0.127	0.119	0.123	0.078	0.085	0.122	0.115
Ef. Gap CBE-	0.122	0.071	0.180	0.143	0.071	0.101	0.122	0.037	0.112	0.131	0.219	0.266	0.247	0.172	0.099	0.116	0.131	0.138
Revenue Efficiency- Variable Return to Scale																		
Average	0.936	0.903	0.907	0.935	0.969	0.967	0.959	0.982	0.990	0.978	0.862	0.826	0.838	0.874	0.936	0.911	0.914	0.923
Public	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.993	0.938	0.985	0.919	0.947	0.920	0.840	0.973
Private	0.911	0.871	0.877	0.914	0.958	0.956	0.946	0.977	0.988	0.972	0.835	0.808	0.816	0.868	0.934	0.909	0.923	0.910
Middle	0.911	0.871	0.877	0.914	0.958	0.956	0.946	0.974	0.984	0.963	0.738	0.785	0.766	0.889	0.925	0.924	0.902	0.899
Small								1.000	1.000	1.000	0.982	0.830	0.858	0.852	0.941	0.901	0.936	0.930
CBE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DMUs	7.000	8.000	8.000	8.000	8.000	8.000	8.000	9.000	10.000	10.000	12.000	14.000	15.000	16.000	16.000	18.000	18.000	11.353
Efficient DMU	4.000	5.000	5.000	4.000	6.000	5.000	5.000	8.000	8.000	6.000	4.000	4.000	4.000	3.000	6.000	6.000	6.000	5.235
Standard Deviation	0.098	0.141	0.137	0.103	0.058	0.064	0.060	0.053	0.030	0.035	0.142	0.136	0.133	0.094	0.068	0.086	0.098	0.090
Ef. Gap CBE-	0.089	0.129	0.123	0.086	0.042	0.044	0.054	0.023	0.012	0.028	0.165	0.192	0.184	0.132	0.066	0.091	0.077	0.090
Profit Efficiency- Constant Returns to Scale																		
Average	0.921	0.832	0.801	0.843	0.919	0.892	0.882	0.959	0.871	0.854	0.778	0.819	0.716	0.754	0.865	0.849	0.785	0.843
Public	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.893	0.639	0.890	0.792	0.704	0.936
Private	0.889	0.777	0.734	0.790	0.892	0.856	0.843	0.948	0.838	0.818	0.734	0.788	0.689	0.770	0.861	0.856	0.795	0.816
Middle	0.889	0.777	0.734	0.790	0.892	0.856	0.843	0.939	0.961	0.941	0.750	0.920	0.745	0.839	0.855	0.853	0.779	0.845
Small								1.000	0.469	0.447	0.711	0.657	0.640	0.719	0.865	0.858	0.805	0.717
CBE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DMUs	7.000	8.000	8.000	8.000	8.000	8.000	8.000	9.000	10.000	10.000	12.000	14.000	15.000	16.000	16.000	18.000	18.000	11.353
Efficient DMU	5.000	4.000	4.000	4.000	5.000	3.000	4.000	8.000	7.000	6.000	6.000	9.000	4.000	5.000	4.000	6.000	5.000	5.235
Standard Deviation	0.152	0.202	0.241	0.230	0.118	0.129	0.144	0.122	0.253	0.247	0.266	0.264	0.240	0.232	0.122	0.148	0.218	0.196
Ef. Gap CBE-	0.111	0.223	0.266	0.210	0.108	0.144	0.157	0.052	0.162	0.182	0.266	0.212	0.311	0.230	0.139	0.144	0.205	0.184

Profit Efficiency- Variable Returns to Scale																		
Average	0.943	0.961	0.840	0.890	0.945	0.947	0.937	0.973	0.986	0.974	0.867	0.863	0.852	0.822	0.918	0.881	0.855	0.909
Public	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.712	0.913	0.796	0.708	0.949
Private	0.920	0.948	0.787	0.854	0.927	0.929	0.916	0.965	0.983	0.968	0.840	0.840	0.829	0.837	0.919	0.891	0.873	0.896
Middle	0.920	0.948	0.787	0.854	0.927	0.929	0.916	0.959	0.977	0.957	0.753	0.931	0.876	0.930	0.924	0.868	0.815	0.898
Small								1.000	1.000	1.000	0.971	0.750	0.788	0.767	0.915	0.905	0.908	0.901
CBE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DMUs	7.000	8.000	8.000	8.000	8.000	8.000	8.000	9.000	10.000	10.000	12.000	14.000	15.000	16.000	16.000	18.000	18.000	11.353
Efficient DMU	6.000	6.000	5.000	6.000	6.000	6.000	5.000	8.000	9.000	8.000	8.000	10.000	8.000	8.000	8.000	9.000	9.000	7.353
Standard Deviation	0.151	0.107	0.238	0.205	0.102	0.110	0.095	0.082	0.044	0.064	0.222	0.232	0.216	0.205	0.113	0.157	0.185	0.149
Ef. Gap CBE-	0.080	0.052	0.213	0.146	0.073	0.071	0.084	0.035	0.017	0.032	0.160	0.160	0.171	0.163	0.081	0.109	0.127	0.104
Revenue Efficiency- Scale																		
Average	0.961	0.949	0.953	0.952	0.977	0.955	0.946	0.987	0.919	0.917	0.953	0.918	0.938	0.947	0.969	0.976	0.950	0.951
Public	0.992	0.948	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.934	0.967	0.923	0.997	0.999	0.996	0.985
Private	0.949	0.949	0.937	0.937	0.969	0.940	0.928	0.983	0.899	0.897	0.944	0.915	0.934	0.951	0.965	0.973	0.944	0.942
Middle	0.949	0.949	0.937	0.937	0.969	0.940	0.928	0.980	0.984	0.984	0.992	0.953	0.982	0.966	0.996	0.999	0.975	0.966
Small								1.000	0.643	0.634	0.872	0.877	0.892	0.939	0.942	0.958	0.925	0.868
CBE	0.983	0.897	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.993
DMUs	7.000	8.000	8.000	8.000	8.000	8.000	8.000	9.000	10.000	10.000	12.000	14.000	15.000	16.000	16.000	18.000	18.000	11.353
Efficient DMU	3.000	3.000	4.000	3.000	5.000	3.000	3.000	7.000	5.000	3.000	2.000	2.000	2.000	3.000	3.000	5.000	3.000	3.471
Standard Deviation	0.077	0.066	0.074	0.055	0.035	0.055	0.055	0.039	0.161	0.156	0.097	0.087	0.100	0.061	0.059	0.049	0.101	0.078
Ef. Gap CBE-	0.034	-.053	0.063	0.063	0.031	0.060	0.072	0.017	0.101	0.103	0.056	0.085	0.066	0.049	0.035	0.027	0.056	0.051
Profit Efficiency- Scale																		
Average	0.977	0.862	0.952	0.939	0.971	0.941	0.937	0.983	0.883	0.879	0.909	0.938	0.851	0.906	0.944	0.967	0.926	0.927
Public	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.893	0.830	0.972	0.993	0.991	0.981
Private	0.968	0.816	0.937	0.918	0.961	0.922	0.917	0.978	0.854	0.849	0.891	0.927	0.845	0.917	0.940	0.964	0.918	0.913
Middle	0.968	0.816	0.937	0.918	0.961	0.922	0.917	0.974	0.982	0.982	0.993	0.981	0.853	0.906	0.930	0.984	0.960	0.940
Small								1.000	0.469	0.447	0.738	0.874	0.838	0.925	0.947	0.951	0.892	0.808
CBE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DMUs	7.000	8.000	8.000	8.000	8.000	8.000	8.000	9.000	10.000	10.000	12.000	14.000	15.000	16.000	16.000	18.000	18.000	11.353
Efficient DMU	5.000	4.000	4.000	4.000	5.000	3.000	4.000	8.000	7.000	6.000	6.000	9.000	4.000	5.000	4.000	6.000	5.000	5.235
Standard Deviation	0.060	0.165	0.077	0.084	0.050	0.068	0.087	0.052	0.251	0.247	0.210	0.120	0.187	0.114	0.084	0.052	0.168	0.122
Ef. Gap CBE-	0.032	0.184	0.063	0.082	0.039	0.078	0.083	0.022	0.146	0.151	0.109	0.073	0.155	0.083	0.060	0.036	0.082	0.087

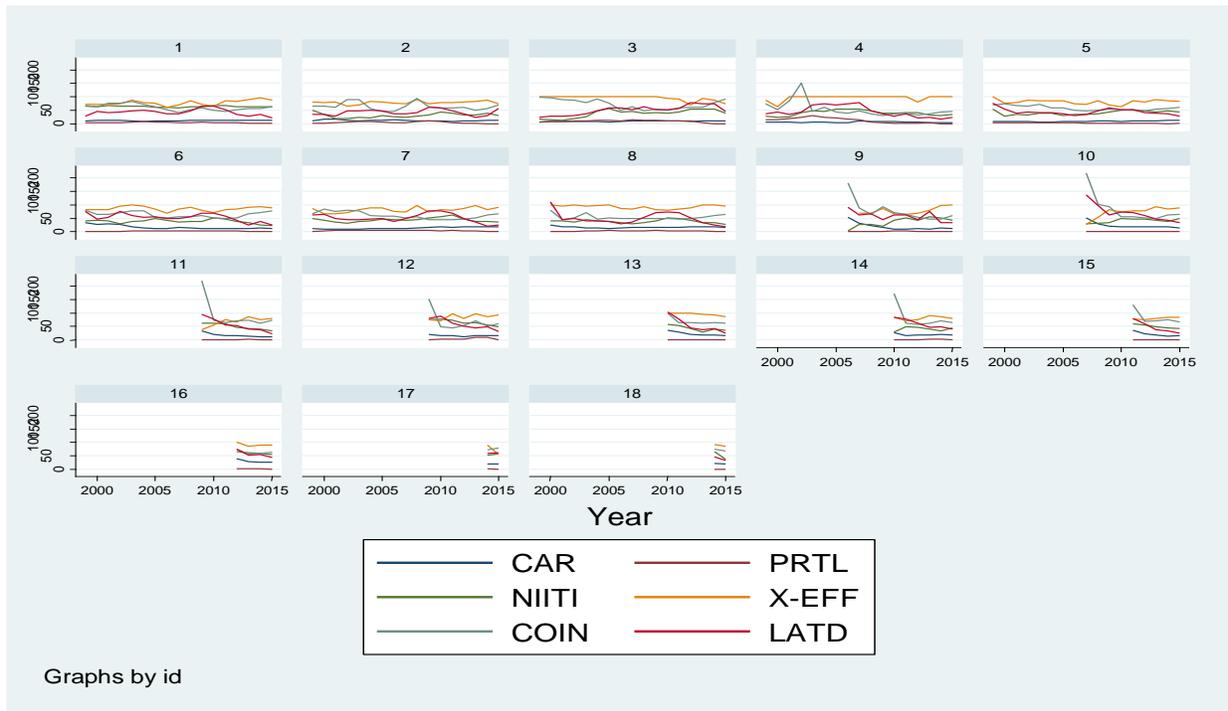
Author's Computation

Annex 7: CRS Model Slacks and Model Target for 2015 (output side)

DMU	Score	Benchmark(Lambda)	Times as a benchmark for another DMU	SumLambda	Slack Movement (Loans)	Projection (Loans)	Slack Movement (Other Earning asset)	Projection (Other Earning asset)
ABAY	0.80641	CBO(0.491838)	0	0.491838	918.0887	3229.428	-195.008	1015.546
ADDIS	0.933436	CBE(0.004590)	0	0.00459	-250.846	511.5084	292.4726	728.6016
AIB	0.928898	CBO(1.262955); ZB(2.410274)	0	3.67323	1008.79	13490.83	409.8464	6977.806
BIRHAN	0.81759	CBE(0.005805); CBO(0.225920)	0	0.231725	254.8353	2130.32	426.4462	1387.964
BOA	0.741051	CBO(0.659763); ENAT(3.997577)	0	4.65734	2958.491	8863.715	-814.367	3036.851
BUNNA	0.848305	CBE(0.001194); CBO(0.435999)	0	0.437193	577.9085	2995.849	-53.6422	1089.787
CBB	0.673249	CBO(0.734527)	0	0.734527	2087.425	4822.932	-466.411	1516.649
CBE	1	CBE(1.000000)	7	1	0	111435	0	158730
CBO	1	CBO(1.000000)	13	1	0	6566.04	0	2064.798
DB	0.861937	CBE(0.058970); CBO(0.754513)	0	0.813483	-1.50924	11525.48	3553.181	10918.23
DGB	0.557199	CBE(0.003389)	0	0.003389	42.79296	377.705	332.2247	538.0097
ENAT	0.988283	CBO(0.051642); ZB(0.309875)	3	0.361517	-126.22	1007.387	249.5661	668.4631
LIB	0.908918	CBE(0.011385); CBO(0.231377)	0	0.242763	-42.5906	2787.975	518.6914	2284.966
NIB	0.960887	CBO(0.519052); ENAT(3.801243)	0	4.320295	823.1879	7717.232	-1339.57	2664.067
OIB	0.777157	CBE(0.002582); CBO(0.904753)	0	0.907335	1521.805	6228.379	226.8898	2277.986
UB	0.860264	CBO(0.551415); ENAT(4.477321)	0	5.028736	1836.05	8696.133	-1653.66	3014.096
WB	0.920766	CBO(0.746711); ZB(1.142810)	0	1.889521	1295.707	7367.622	-999.503	3613.832
ZB	1	ZB(1.000000)	3	1	0	2156.69	0	1813.096

Source: Author's Computation

Annex 9: Graphical Test of Unit root



Annex 10: Fisher-type Unit Root Test

Variables	Lag	p-value	Inv chi-squared
RoA	0	0.0000	204.1
RoE	0	0.0000	114.7
HHID	0	0.000	133.5
HHILN	0	0.0009	62.7
MSLN	0	0.0003	67.1
MSDP	0	0.0004	125.4
XEFF	0	0.0000	149.2
SEFF	0	0.0000	297.3
<i>Ownership</i>	<i>0</i>	<i>0.0000</i>	<i>1.000</i>
<i>LNDP</i>	<i>0</i>	<i>0.0000</i>	<i>74.7</i>

Author's Computation

Annex 11: Test of Normality

sktest roe roa nim car prtl niiti xeff coin latd dtd

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
ROE	193	0.0000	0.0000	63.45	0.0000
ROA	193	0.0749	0.4878	3.70	0.1576
NIM	193	0.1283	0.9871	2.34	0.3103
CAR	193	0.0000	0.0000	73.47	0.0000
PRTL	193	0.0000	0.0000	.	0.0000
NIITI	193	0.8048	0.7152	0.19	0.9075
XEFF	192	0.0000	0.0005	26.54	0.0000
COIN	193	0.0000	0.0000	.	0.0000
LATD	193	0.0000	0.0006	28.69	0.0000

Author's Computation

Annex 12: Multicollinearity Test VIF

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAR	.399	2.505
	PRTL	.561	1.783
	NITI	.823	1.216
	XEFF	.721	1.387
	COIN	.588	1.702
	LTD	.490	2.039
	Mean		1.772

Author's Computation

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of laddp

chi2(1) = 3.11

Prob > chi2 = 0.0778

Annex 13: Profile of sample interviewees
Panel A. Interviews with Bank Managers

Code	Position of interviewee	Interview Type	Bank ownership
BM1	Risk Manager	Face-to -face	Private
BM2	Controller	Face-to -face	Private
BM3	Research and Planning Director	Face-to -face	Private
BM4	Director Marketing	Face-to -face	Private
BM5	Risk Director	Telephone	Private
BM6	Credit Manager	Telephone	Private
BM7	Vice president	Face-to -face	Private
BM8	A/Director International Banking	Face-to -face	Private
BM9	Director Strategy	Face-to -face	Private
BM10	Risk Director	Telephone	Private
BM11	A/v/p Customer Services	Face-to -face	Private
BM12	Director, Business Development and Planning	Face-to -face	Private
BM13		Face-to -face	State
BM14		Face-to -face	State

Panel B. Interviews with Regulatory Staff

Code	Position of interviewee	Interview Type
RS1	Team Leader	Face-to -face
RS2	Team Leader	Face-to -face
RS3	Team Leader	Face-to -face
RS4	Team Leader	Face-to -face

Annex 14: Interview questions

Interview questions with Bank Regulators (the National Bank of Ethiopia)

1. *How do you see the current banking structure in Ethiopia?*
2. *Do you consider Ethiopian banks as efficient?*
3. *What factors are affecting the banking structure and efficiency?*
4. *How do the banking market structure and efficiency relate to bank performance?*
5. *Which of the two factors (structure or efficiency) has greater impact on bank performances?*
6. *What role do you think that the NBE needs to play to enhance efficiency?*
7. *What role do you think that the NBE needs to play to bank market structure?*
8. *How the NBE measure and follows the performance of each bank? How they are measured and reported?*
9. *What proxy variables do you use to measure economic performance, industry performance?*
10. *What impact does some environmental factors from the industry and macroeconomic situation such as bank ownership type, regulation, economic growth etc have on bank performances and conduct?*
11. *How do you see the management behavior in the banking system?*

Interview questions with bank Senior Managers

1. *What factors do you consider when you analyze the performance of your Bank?*
2. *What impact do some environmental factors from the industry and macroeconomic situation such as bank ownership type, regulation, economic growth etc have on bank performances and conduct? How are they measured?*
3. *How do those factors relate to your bank performance?*
4. *Which strategies do you pursue to win the competition in the market? such as price , availability of services , innovation, promotion etc*
5. *How do these strategies relate to the current banking structure? How do they affect performance?*
6. *How do you see the management behavior towards risk? Is there expense preference behavior, risk avoidance etc?*
7. *How do you rate the efficiency level of your bank against peers and other banks in the industry? How you evaluate your Bank's efficiency?*

8. *How do the banking market structure and efficiency relate to your bank performance?*
9. *What role do you think that the NBE needs to play to enhance efficiency?*
10. *What role do you think that the NBE needs to play to bank market structure?*

Vice President Operations

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Debub Global Bank S.C.

Phone: [+251911446356]

Addis Ababa, Ethiopia

CV updated on March 2017

Tesfaye Boru Lelissa

Education

Currently pursuing PHD in Business Leadership, DBL (UNISA) defended the final result on February 2017

MBA in Business Administration (AAU), 2007

BA in Management (AAU), 2003

BA in Economics (AAU), 2014

Fully Certified ACCA member

Experiences

Vice President Operations- Debub Global Bank S.C. February 2017 to date

Director, Knowledge and Innovation Department, Zemen Bank S.C, September 2016 to February 2017.

Manager-Risk and Portfolio Management Department, Zemen Bank S.C. April 1, 2010- September 2016 reporting to the Board and serving as Liaison officer to the Financial Intelligence Center (FIC) and the National Bank of Ethiopia(NBE)

Manager- Risk and Portfolio Management Division, Zemen Bank S.C March 19, 2009- March 31, 2010

Manager, Portfolio Management and Credit Information Division- Zemen Bank S.C, January 2009- March 18, 2009

Principal Risk Management Officer, Senior Risk Management & Monitoring Officer and Risk Management & Monitoring Officer, Bank of Abyssinia S,C, March 2007- January 2009

Junior Bank Inspector I- National Bank of Ethiopia May 2005 – March 2007

Junior Loan Officer- United Bank S.C. 2003-2005

Others

Training Expert at Federal Supreme court –contract basis

Board Secretary at Bank of Abyssinia- part-time job

Trainings

Staying in the Helicopter-the Key to profitable Growth, ATBA Business PLC

Warehouse Receipt Financing Bank Operational- International Finance Corporation, World Bank Group

Executive Leadership and Management Training (TTC)

Asset and Liability Management Practice, Kenya Institute of Bankers

Introductory Course in Bank Supervision (IMF/East Afritag),

International Financial Reporting Standards (Deutsche Bundesbank in Collaboration with NBE),

Business Communication & Report writing Skills, Ethiopian Institute of Banking & Insurance),

Domestic banking Practice Ethiopian Institute of Banking & Insurance),

Domestic Banking Operations (United Bank),

Driving Skill, Discipline & Vehicle Handling awareness creation (Automotive Technology professionals Association),

Computer Training at Debora Computer PLC

Skills & Activities

Skills : *Statistical software like SPSS, STATA, E-view, Atlas*

Languages : *English, Amharic and Oromiffa*

Memberships :

- *Member of the Ethiopian Management Professional Association*
- *Processing membership for Association of Chartered Certified Accountant (ACCA)*
- *Applied membership in The Ethiopian Economic Association*
- *Member of the Asset-Liability Committee of Zemen Bank (ALCO)*

- *Member of the Senior Management Group at Zemen*
- *Served as Chairperson of the Loan Review Committee (designated by the Board)*

Interests : *Financial Econometrics, Banking and Finance, Financial Risk Management, Strategic Management, Finance*

Awards & Grants:

Winner of the top scorer award (from Ethiopia) for paper F8 (Audit and Assurance)

Winner of Belgium Embassy in-country scholarship grants during university stay at AAU.

Graduated with distinction in the field of Management (taking the 3rd rank) with CGPA 3.41 and MBA graduation CGPA of 3.73 from the 4 point grading scheme

Letter of thanks for Voluntary supervision service of Electronic Information Services (EIS) at AAU

Letter of thanks for producing technical paper on Risk Based Supervision, NBE

Letter of appreciation from Zemen's Board for successful accomplishment in establishing and leading the Risk Management System of the Bank

Publication Highlights:

Journal Publications (can be accessed online at European Journal of Business and Management)

Factors Influencing the Level of Credit Risk in the Ethiopian Commercial Banks: The Credit Risk Matrix Conceptual Framework. 12/2014; European Journal of Business and Management.

Efficiency in the Ethiopian Banking System: An Application of Data Envelopment Analysis. 11/2014; European Journal of Business and Management.

The Determinants of Ethiopian Commercial Banks Performance. European Journal of Business and Management. 01/2014; 6(14).

Loan Classification, Average Recovery Rate and Provisioning Practices of Ethiopian Banks- Cross Country Comparison. 01/2014; 6(34). European Journal of Business and Management.

The Impact of Policy Measures on Ethiopian Private Banks Performance: the Case of Government Bill Purchase. European Journal of Business and Management. 01/2014; 6(27).

*Causes for Foreign Currency Liquidity Gap: a Situation Analysis of the Ethiopian Economy
Journal of Poverty, Investment and Development*

Impact of Promulgation and Enactment of AML/CFT Rules on Resource Mobilization: Case of Ethiopian Banks Journal of Poverty, Investment and Development

The Link between Performance Management System and Employee Effectiveness: the case of Ethiopian Banks Journal of Poverty, Investment and Development

Articles for Magazines

*Compliance needs to be synergized with the pillars of Internal Control framework, ACCPA
Compliance Magazine-Published*

*AML Activities Need Dedication: Ethiopia's FIU Leads The Way: ACCPA Compliance
Magazine-Published*

Positioning the Compliance Function: ACCPA Magazine- under review

Value addition to Government Services: an option to reduce fiscal Deficit: EBR- under review

PHD Dissertation Topic

*Tesfaye Boru: An Assessment of The Impact of Banking industry Structure and Efficiency on
Performance: The case of Ethiopian Banking Sector- Advisor: Dr. Abdulrezak Mohammed*

Master's Thesis

*Impact of Financial Liberalization in the Ownership, Market Structure and Performance of the
Ethiopian Banking Industry: Advisor Professor Chandra Dash*

Published Thesis/Books (can be accessed online at Amazon.com)

Financial Liberalization and Bank Performance- Amzon Books

Determinants of Ethiopian Banks Performance -Amzon Books

Technical Reports

Technical Paper on Risk Based Supervision with technical assistance from the IMF

References

(Address will be provided on request)

*Ato Gethahun Nana, former Vice Governor National Bank of Ethiopia, current CEO of
Development Bank of Ethiopia*

Ato Helaway Tadesse, former Senior Vice President at Zemen Bank S.C

Dr Abdulrazak Mohammed, Addis Ababa University Commercial Collage

*Ato Adamseged Belay, Legal Counselor at Zemen Bank S.C and former appointee to the Prime
Minister at Training Institute of Lawyers and Judges*