Determinants of Competition in the Commercial Banks of Ethiopia: An Empirical Evidence

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Statement of Certification

This is to certify that Sarah Serawitu has carried this research work on the topic entitled "Determinants of Competition in Commercial Banks in Ethiopia: An Empirical Evidence" under my supervision. This work is original in nature and it is sufficient for submission for the partial fulfillment for the award of MA in Business Administration.

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Abbreviations

AIB – Awash International Bank

BoA – Bank of Abyssinia

CBE – Commercial Bank of Ethiopia

CEO – Chief Executive Officer

CR – Concentration Ratio

DB – Dashen Bank

GDP – Gross Domestic Product

HHI – Herfindahl-Hirschman Index

KPI – Key Performance Indicator

NBE – National Bank of Ethiopia

NIB – Nib International Bank

P-R – PanzarRosse

RPD – Relative Profit Differences

SCP – Structure Conduct Performance

UB – United Bank

WB – Wegagen Bank

Abstract

The development of a financial sector can very well be improved by enhancing the level of competition which can be achieved by improving the determinant factors. It is pertinent, therefore, to measure the level of competition and determine what factor affect the magnitude of the competition in the financial sector. This study provides an empirical evidence on the commercial banks of Ethiopia over the budget years, from 2000-2015. It measures the level of competition among the commercial banks of Ethiopia by taking a sample of the seven private commercial banks, i.e. Awash International Bank, Bank of Abyssinia, Dashen Bank, United Bank, Wegagen Bank and Nib International Bank, and Commercial bank of Ethiopia by using the Panzar-Rosse approach. I further tries to gauge what variable determine the level of competition in the commercial banks by using the contestability of market, financial liberation and economic factors. The results of the research show that the commercial banks of Ethiopia are in monopolistic competition which is a midway between perfect competition and monopoly; the market is in a long run equilibrium. The determinants of competition are found to have a joint statistically significant effect on the level of competition. The study suggest enhancing better access to financial services with in the country and also decrement of NBE's regulatory power.

Key words; commercial bank competition, determinants

Chapter One

1. Introduction

1.1 Background of the Study

It is indeed any country's macroeconomic policy to achieve the three most important objectives; economic growth, stable economy and reducing unemployment. Among other factors that enable countries to achieve these three goals, one of them is financial development. Although financial depth is an important determinant of the magnitude of growth, as is indicated by the finding of Khan and Senhadji (2000), the positive relationship is strong and statistically significant. Different studies, including Motelle (2014), have put financial development as an important derive for growth and stability.

Financial development, simply put, is the process through which financial institutions lubricate the economy by creating a conduit for resources from surplus to deficit sectors. Levien (1997) has stated that financial institutions or intermediaries play a crucial role in mobilizing and allocating domestic resources, supporting trade and providing avenues for diversification and hedging to mitigate financial risk as well as allow easier access to opportunities for investment. The intermediation role of these institutions can take different forms in different economic systems. The general essence, however, is to collect and process information, reduce information asymmetries and transaction cost.

Financial institutions, specifically the banking sector, are imperative in the economy in terms of resource mobilization and allocation. The banking sector is, by far, the most important part of the financial system in developing economies, accounting for the bulk of the financial transactions and asset (Claessens, 2009). Two or three decades ago the financial sector of many developing countries was characterized by narrow financial systems, and since this period many countries have liberalized their financial systems with the intention of creating a conducive environment for economic growth and stability.

The Banking Sector in Ethiopia has come a long way during these past 20-25 years. After the fall of 'Derg', in the early 1990's, the Ethiopian government implemented several reform measures. Among the measures taken was the issuance of Proclamation NO. 84/1994 which legalized domestic private investment including the banking industry; this brought the establishment of 16

private commercial banks. There are now 18 banks in the nation of which two are state owned, i.e. the Commercial and Development Banks of Ethiopia.

In the context of developing the financial sector of Ethiopia, in particular the Ethiopian banking industry, enhancing competition among the commercial banks is crucial. According to Claessens (2009), competition in the financial sector matters in the sense of ensuring efficiency, facilitating access to financial services and bringing stability to the economy at large. In order to heighten competition, therefore, it is necessary to assess the trend commercial banks have taken in their financial management, to measure the current level of competition which clarifies the type of competition the market is in, and lastly, to determine the factors that influence that level of competition. Identifying variables that affect level of competition is important in increasing the attributes of the financial sector to the overall growth of the economy of the country.

1.2 Statement of the Problem

Competition, in any given profit-based business, is essential in the sense that it fuels innovation and efficiency. Adam Smith, the Father of Economics, has already established, in principle in his book *The Theory of Moral Sentiments* (1759), the benefits of competition in allocating efficiency, and theoretically it applies for any given sector. Indeed, Claessens (2009) identifies the role of competition in the financial sector; he recognizes how competition can increase the efficiency with which the financial sector operates.

A competitive and efficient financial sector is a prerequisite for economic development and growth, especially in developing countries. Banking Industry Liberalization is one key consideration in improving efficiency. The benefits of banking industry liberalization has been widely studied with conclusions insuring the positive effects involved. In order to attain economic development, therefore, alike most developing countries, Ethiopia has also embarked on a number of reforms to improve the efficiency and competitiveness of the banking sector. (Sanya and Gaertner, 2012)

Ethiopia has been taking cautious approaches toward liberalization of the banking sector compared to fellow African countries; where the commercial banks are still protected from foreign participation, where credit controls, reserve requirements and interest rate controls still exist. After the wake of the 2008 financial crisis, the merits of uncontrolled banking industry development has

been put to question. However, the crippling effect of the lack of competition in the banking industry is not questionable.

There are ample studies that covered the definition and measurement of competition in the banking sector. Though, almost all are focused on the developed countries and what little study there is of developing countries focuses on the large economies. There are no empirical evidences that study the level of competition in the Ethiopian banking sector, nor are there studies on the determinant of the level of competition. With most Ethiopian commercial banks envisioning of extending their services on an international basis by the year 2025, it begs the question of the readiness for such a change and the ability of these commercial banks to measure up to any other commercial bank in the world in terms of competition. In order to support the commercial banks' advances to such goals with policies, proclamations etc, the current level of competition and its determinants ought to be identified.

1.3 Research Questions

This research, given the points raised above, is intended to answer the questions,

1) What is the level of competition among the commercial banks of Ethiopia?
2) What are the factors that influence competition among commercial banks in Ethiopia?

1.4 Research Objective

The main objective of this research is to assess the competition of the commercial banks in Ethiopia.

The specific objective of the research is:

1) To measure the level of competition among the commercial banks of Ethiopia
2) To identify the factors that determine the competition among commercial banks in Ethiopia

1.5 Significance of the Study

Although there are ample studies that covered the definition and measurement of competition in the banking sector, almost all are focused on the developed countries and what little there is of developing countries focuses on the large economies. There has not been a study that fully assesses

the level of competition in Ethiopia, at least not to the best of the knowledge of the researcher. This study is expected to provide empirical evidence on the determinant of the competition in the commercial banks of Ethiopia. It is mostly useful for decision makers such as the NBE and also the government at large for it pinpoints what affects the level of competition. Given that information, actions can be taken to better the level of competition in the industry and enhance the overall economic stability and growth. The researcher also hopes that the research may serve as a supplementary document for a broader and in depth study of the subject.

1.6 Scope of the Study

The scope of the study is limited to the assessment of competition among the commercial banks of Ethiopia by using selected commercial banks that are currently operating in Ethiopia.

1.7 Limitation of the Study

Although there are different researches that have forwarded many variables that could determine the level of competition, this study only concentrated on Market Structure (Concentration ratio, Herfindahl-Hirschman Index), Contestability (Minimum Capital Requirement), Financial Liberalization (Financial Liberalization Index) and Macro-economic Variables (real GDP, GDP per Capita, real GDP growth and Inflation).

1.8 Organization of the Study

The research comprises five chapters. The first chapter is the introduction where by the background of the study, the problem addressed, the research question and objective, the significance, the scope and limitation of the study are discussed. The second chapter covers the theoretical and empirical review of literature. The third chapter explains the methodology employed in conducting this research. The fourth chapter consists the data analysis and interpretation. The fifth chapter contains summary of the findings, conclusion and possible recommendation.

Chapter Two

2. Literature Review

This chapter contains the review of literature that are relevant to the topic under discussion. Subsection one consists theoretical discussion on the meaning of competition, in general and in the financial sector, the different methodology of measuring competition and the determinants of competition in the banking sector. The second subsection discusses the empirical literature review on the empirical application of the methods of measuring competition and the identification of the determinants of competition in a given industry. The last subsections gives the historical background of the Ethiopia banking industry.

2.1 Theoretical Literature Review

The concept of competition, although initially limited to economic thinking, over the years, has been given different interpretations for diverse sectors. Adam Smith (1759) was the first to describe competition as a central element of economy. Léon (2014) exhaustively explains the two major competition concepts developed by various economists. Rather than run the risk of repeating parts of Léon's research, the general thought behind the two theories of competition will be briefly discussed.

Léon (2014) explains that there are two major concepts of theory in economic thought. The first, which defines competition as a static state was forwarded by Cournot (1838). He defined competition as the equilibrium condition where prices equal to costs of production. Several assumption must be met to obtain competition; a considerable number of rivals, possessing common knowledge about market opportunities, free entry and exit. As the number of producer (rivals) increase, according to Cournot, excess price of costs approaches to zero. Based on Cournots's theory, and with other important adjustments by other economists, imperfect competition was proposed as a theory. Imperfect competition was a reconciliation of perfect competition and reality for business world was a mixture of both competition and monopoly. Different measures of competition have been rooted from this theory.

The second theory is the Austrian School which argues that, rather than a static state, competition is a rivalry process; firms continuously engage in activities that help them cope up with

competitors. It is a mechanism where less efficient incumbents are removed and replaced by more efficient entrants (Léon, 2014). In a free competitive market, temporary static monopoly power is gained when a firm obtains a competitive advantage over its rivals. But because it is a dynamic environment, the monopoly power only lasts for the interval it takes other competitors to imitate or supersede the existing advantage.

As in any other sector, the importance of competition in the financial sector has been affirmed. According to Claessens (2009), competition in the financial sector matters for the enhancement of efficiency in production, quality of product and innovation in the sector. But he also mentions the recent financial crisis to stress the effect of excessive competition which can result in instability in the financial sector. He theorizes that among other factors the effect of competition in the financial market can be seen in three dimension; efficiency in the financial sector, access to financial services and stability in the financial sector. These three dimensions are also mentioned in Hakam et al. (2013) as the positive externalities of banking competition. First, in theory, increased competition leads to financial sector development and efficiency. This, essentially, means lower cost, enhanced efficiency, greater product innovation and improved quality.

Although greater competition, by improving development and efficiency, is expected to lead to greater access, theoretical implications show that the relationship is not so easily explained. It has been shown that access to finance, in addition to the factors mentioned above, can be affected by franchise value of the financial institutions, relationship lending, size, structure and quality of information of financial institutions and the supply, demand, distribution and consumption of financial services; the effect of all these and their trade-off with the degree of competition is what, basically, affects access to financial services. Lastly, with more competition the financial sector ought to become less volatile with fewer financial crisis and more robust and higher financial integrity.

Bikker & Haaf (2002), Claessens (2009), Demirguc-Kunt & Pería (2010) and many others have noted, in their studies, that the approaches used to measure competition can be broadly classified into two; the structural and the non-structural approach. While Xu et al. (2013) classifies the measurement of competition under the concepts of market power, for one, and efficiency, as the other; the basic intuition and the models discussed under both concepts are the same with the afore mentioned researchers.

2.1.1- Structural Measurement Approach

The structural measurement approach infers competition from the structure of the market. This is best explained in the context of the Structure-Conduct-Performance (SCP) model (Xu et al., 2013). SCP seeks to explain aspects of conduct and performance of firms in terms of the structural characteristics of the market in which the firms operate. Structural characteristics of the market cover nō of firms, absolute and relative size of firms, entry and exit conditions, extent of product differentiation and other factors that may have an impact on the market structure.

The market structure is, then, expected to influence the behavior/ conduct of firms. Conduct variables include pricing strategies, collusion and other strategic conditions such as product quality, advertising expenditure, etc. These conduct variables, in turn, according to SCP model, affect the performance of firms.

According to the SCP paradigm, the more concentrated an industry, the easier for firms to operate in an un-competitive manner. When the nō of firms decreases, i.e. A more concentrated market, the likelihood of tacit collusion becomes more evident. Market concentration, therefore, becomes the main determinant in measuring the existence and level of competition in the sense that concentration becomes the proxy for competition.

Empirical works focus on the number of firms and their relative size in-order to gauge market concentration. Concentration indices take both the distribution in size and the number of firms into account in a given market. Léon (2014) states that even though Hall & Trademan (1967) have forwarded a number of criteria for having a good Concentration Index, all the listed criteria is not respected by existing measures.

Although many concentration measures have been forwarded, almost all researchers focus on the three widely used measures; the number of firms, Concentration Ratio (CRk) and Herfindahl-Hirschman Index (HHI). The number of firms' index doesn't take into account the distribution of firms, therefore, few papers employ this as an indicative of concentration. Concentration ratio is calculated by summing the market shares of only a number of the largest banks, neglecting the small banks in the market; determining the selected banks is a random decision. The HHI is more data intensive, compared to the former two; it requires information on the entire firm size distribution, i.e. the total nō of firms in the market. After having discussed different concentration

indices, Bikker and Haaf (2002) observe that with the exception of CRk and HHI, the rest of the indices have been applied only sparingly in the empirical banking literature; these two are often used as proxies for market structure in measuring competition. They, further, assert that various concentration measures may show strongly diverging values for the same market, due to the use of varying weighting schemes which reflect mainly different assessment regarding the relative impact of the size of the banks on competition in a certain market.

Several researchers, however, have put to question the theoretical and empirical implications of the structural approach and the models forwarded under it. Claessens (2009) explains the theoretical shortcoming by stating that it's not necessarily structure that always influences conduct and performance in a market; it can also be the other way around whereby structure can similarly be influenced by conduct and performance of the market. He also states that in an industry such as the financial sector, high concentration and market power is necessary to compensate for the rapid technological innovation and may not mean reduced welfare. Actual degree of entry and exit and market structure are not necessarily the most important factors in determining competition. Rather, as the general contestability theory implies, it is the degree of absence of entry and exit barriers that matter for competitiveness.

Bikker et al. (2010), by quoting prior studies, assert that concentration is generally a poor measure of competition for higher competition has been found in highly concentrated markets. Due to the mismatch, they deem concentration measure as an extremely unreliable proxy for competition. Léon (2014) mentions the efficiency-structure hypothesis which states that the structure of the market may reflect the differences in efficiency rather than the competitive situation. With that, he argues that concentration measures cannot be used as proxies of competition because what they reflect is difficult to know. Sanya and Gaertner (2012) point out that interpretation of measures concerns the difficulty of setting an appropriate definition of the market, which also apply for East African Countries.

While researches that address the measurement of competition as structural and non-structural don't necessarily mention regulations and the degree of contestability as a separate method, in researches of Claessens (2009), Demirguc-Kunt & Pería (2010) and Léon (2014) it is mentioned as such. The degree of contestability, which argues that firms behave in a competitive manner in

the absence of entry and exit barriers, is raised as one of the reasons in explaining the shortcomings of SCP.

Claessens (2009) states that this method takes into account entry requirements, formal and informal barriers to entry for domestic and foreign banks, activity restrictions etc. It also considers changes over time in financial instruments, innovations, etc. as these can lead to changes in the competitive landscape. In explaining why competition is a possibility in a highly concentrated market, Demirguc-Kunt & Pería (2010) clarify that the threat of bank entry and exit can exert pressure on incumbent banks. Hence, they insist that an analysis of competition in the banking sector requires a close examination of the regulations regarding bank entry and transparency in the banking sector.

Léon (2014) argues that the degree of contestability in banking is influenced by non-legal barriers, such as technical and informational barriers. Findings of Delis (2010) suggest that in high-income countries the market competition emerged as a direct aftermath of financial liberalization. In developing countries, however, the liberalization didn't produce the same efficiency gains until it was backed up by well-functioning institutions. Further, Léon (2014) by quoting Delis (2010) asserts the reason for the weak regulatory frameworks in relation to competition, in the banking sector of developing economies, as the presence of an informational wedge and adverse selection problem.

2.1.2- Non- Structural Measurement Approach

Non-structural models for the measurement of competition evolved in reaction to the theoretical and empirical limitations of the structural model. Bikker and Haaf (2002) perceive that only few studies had attempted to explicitly take account of the conduct of banks in using the SCP paradigm, this being the case in their analysis they only observe the relationship between Structure and Performance. Léon (2014) states that the Non-structural approaches collect empirical evidence on the nature of competition by directly observing conduct of banks. The models in this approach can be classified into two in terms of the root general competition theory taken; the first are based on the Oligopoly Competition theory (Lerner Index, Conjectural Variation Model and the Panzar and Rosse Model) while the second are based on the Dynamic Conception of Competition (Persistence of Profits Model and the Boone Indicator).

Bikker and Haaf (2002) and Léon (2014) exhaustively assess the theory, application, advantage and disadvantage of each model. Here below, the theory behind each model will be discussed briefly. The Lerner Index, also called the price-cost margin, is a method used to measure the market power of a firm. Market power is identified by the difference between a firm's price and marginal cost i.e. the price is equal to the marginal cost in the case of perfect competition and to the contrary in the case of less competitive situations there is a bigger difference between the price and the marginal cost.

The different problems associated with the Lerner index saw the development of the Conjectural Variation Model. One of the problem of the Lerner Index addressed here is that the previous model couldn't clearly put why markets have a bigger difference between their price and marginal cost. Such a difference could be because of the inelastic demand in the market or it could be the less competitive environment. The conjectural variation will, therefore, help measure the elasticity of demand in the market. Léon (2014) by inferring from Bowley (1924) defines Conjectural Variation as the belief one firm has about its competitor's reaction if it varies its output or price.

The first Conjectural Variation or Iwata Model, Iwata (1974), allows the estimation of conjectural variation for individual banks supplying a homogeneous product in an oligopolistic market. The method involves the estimation of a market demand function and the cost function of individual banks to obtain a numerical value of the conjectural variation for each bank. The second Conjectural Variation or Bresnahan Model, Bresnahan (1982) and Lau (1982), present a short-run model for empirical determination of the market power of an average bank. The conjectural variation is determined by simultaneous estimations of the market demand and supply curves. It should be noted that the Conjectural Variation Model, in the end, is Lerner Index with the adjustment for elasticity.

The Panzar-Rosse Model determines the competitive behavior of banks on the basis of the comparative static properties of reduced form revenue equation based on cross-country data (Bikker and Haaf, 2002). This model investigates the extent to which a change in the factor input prices is reflected in (equilibrium) revenues earned by a specific bank. It provides the so called H-statistics as a measure of the degree of competitiveness whereby the measure runs from 0 (joint monopoly competition) to 1 (perfect competition), a value less than 1 is identified as monopolistic competition. However, in order to get a plausible result from this method, banks need to have

operated in a long term equilibrium, the performance of banks needs to be influenced by the actions of other market participants, the price elasticity should be greater than unity and there should be a homogeneous cost structure. Given the invalidity of the conclusion when there is no long-run equilibrium, a test on the elasticity of profitability to input prices is recommended. This test gives an E-statistics, when E is zero the market is in a long run equilibrium (Poshakwale and Qian, 2009).

Granting the advantages of the Lerner Index, the Conjectural Variation Model and the Panzar-Rosse Model, the fact that these measures neglect the dynamics of the market and non-pricing strategies has led to the development of other models that take into account these factors; the Persistence of Profitability and the Boone Indicator.

The Persistence of Profitability Method consists of two theories; first absence of entry and exit barriers help to eliminate any firm's abnormal profit quickly (Goddard et al., 2010). Poshakwale and Qian (2009) explain that the abnormal profit ought to attract new entrants to the market which reduces the excess return. If the abnormal profit still exists after a certain period of time, however, it indicates that there exists barriers of entry in the market. The second, the profits of all firms tend to converge towards identical long-run average value. This model's application, as Léon (2014) puts it, is rather scarce.

The Boone indicator is also called the PE indicator, or Relative Profit Differences (RPD). By quoting (Van Leuvensteijn et al., 2007), Xu et al. 2013 explain that this model is based on the notion, first, that more efficient firms (that is, firms with lower marginal costs) gain higher market shares or profits and, second, that this effect is stronger the heavier the competition in that market is. They further clarify that there is a negative relationship between efficiency, measured in terms of marginal costs, and profits; the more intense this negative relationship is, the more competitive markets will be. So, in practice, the PE indicator will have a negative sign when the relationship between marginal costs and profits is estimated, and it will be more negative the higher the level of competition is.

2.2 Empirical Literature Review

In terms of applying the Structural Measurement approach not a lot recent researches solely depend on these measurements to gauge the degree of competition in a market(s). As an example, however,

Kiyota et al. (2007) in assessing Financial Sector Liberalization in the case of Ethiopia use the bank Concentration Ratio and find that Ethiopia's CR is 87.9% which shows high concentration and the highest in East Africa.

Poshakwale and Qian (2009) used different models to test the degree of competition in Egypt. Applying the P-R model, they found monopolistic competition in the banking sector of Egypt where the H-statistics is 0.583; in breaking down the H-statistics they further deduced that the government banks to be less competitive than the private banks and the foreign banks than the domestic banks. By running an E-statistic test, they asserted that the banking sector in Egypt was in a long-run equilibrium which assured the correctness of their conclusions from the H-statistics. The outcome from Conjectural Variation Approach showed temporal variation in the level of competition which was attributed to the financial reforms in the banking sector of Egypt. The result of the Persistence to Profit Model, although statistically insignificant, showed that, in Egypt's banking sector, the government banks had higher abnormal profit than the private banks and the domestic banks earned abnormal profit than the foreign banks.

Demirguc-Kunt and Pería (2010) in analyzing competition in the Banking Sector of Jordan using the P-R model found that there existed monopolistic competition in the sector. They found a 0.19 H-statistics and the market was at a long run equilibrium for they failed to reject the null hypothesis of E=0. The employment of the Lerner Index further justified their conclusion for there existed a steady increment in the Lerner Index which projected greater evidence of market power.

Hamza (2011), used the P-R model to determine the characteristics of the Tunisian Banking Sector. He run the P-R using Interest Income and Total Income for comparison, which showed that the H-statistics (0.67) where Total Income was a dependent variable was lower than the H-statistics (0.715) where Interest Income was a dependent value; he also found that the market was in long-run equilibrium.

Sanya and Gaertner (2012) found that the Lerner Index increased for all but one country, Kenya, in the East African Countries over the period of the sample; this indicated that the competition in the banking sector of the rest of the countries decreased over time. The average H-statistics for the region was 0.61 (Monopolistic Competition). However the banking Sector of Rwanda operated under monopoly (H-statistics of 0.24).

Kashi and Beynabadi (2013), measured the degree of competition in the Iranian Banking Sector using the P-R model, where they found H-statistics of 0.710 (monopolistic competition). The sector was in a long run equilibrium.

Xu et al. (2013) argued that the earlier measurements that had presented a declining bank competition in China, despite the reforms implemented to foster it, was because the measurements employed (the Lerner Index and the Panzar- Rosse) didn't account for the interest rate regulation in the Chinese banking industry. Using the Boone indicator, they have found that competition actually had increased for the time-period tested.

Amidu and Wilson (2014) having used the Boone indicator, found that the competition level of the banking sectors in Africa varied. However, bank competition improved in many countries including Ethiopia, and the improvement of the competitive environment in these countries was predicted to have been driven by the deregulation and liberalization of the entire financial sector. Moyo et al. (2014) asserted that although low spreads were registered in Ethiopia, contrary to other sub-Sahara African countries, they noted that, that reflected less of bank competition rather an indication of government intervention in the financial sector including regulating interest rates, at levels perceived to consistent with social goals of the country.

Motelle (2014) in assessing the competitiveness of the banking industry in the Southern Africa Development Community (SADC) found that the banking industry was characterized by monopolistic competition. The bank regulation of the region was inversely related to competition.

Abel and Roux (2016) assessed banking sector competition in Zimbabwe using Panzar-Rosse approach found that there exists a monopolistic competition and that, on an annual basis, the banking sector evolved towards perfect competition. They cautioned that in order to maintain the degree of competition and further increase it, the government should abstain from tampering with market forces.

2.2.1 Determinants of Banking Competition

The question of the determinants of banking competition was only, to some extent, treated by the economic theory because of the complexity of identifying factors that affect the degree of competition (Hakam et al., 2013). Although there are no theoretical foundations as to what the

determinants of banking competition are, different researches forward their own number of determinants to help them in their empirical applications.

Bikker and Spierdijk (2008) argue that identifying the main determinants of the level of competition is important in developing an optimal policy to foster competition. They categorize the potential determinants of competition into five types of factors. Market structure (Concentration Ratios), Contestability variables (Activity restrictions and Restrictions on foreign investments), Inter-industry competition (Capital markets), Institutional variables (Regulation Index and Socialist History index) and Macro-economic conditions (GDP per capita and real annual GDP growth) were regressed against competition for 76 countries. With an adjusted R^2 of .82, the potential determinants had explained competition. Sanya and Gaertner (2012) run the average value of the Lerner Index (a proxy of competition) against market structure, contestability, level of economic development, institutional framework, bank specific conditions and liquidity preference of banks. They found that all variables were statistically significant.

Delis (2010) reduced the determinants of competition to three categories; financial liberalization (consisting credit controls and reserve requirement, aggregate credit ceiling, interest rate liberalization, banking sector entry, capital account transactions, privatization, securities markets and banking sector supervision), Institutional Environment (proxies by transparency, law quality and bureaucratic quality) and Control variables are factors that may affect the market power of banks (capitalization and bank size for bank specific variables and GDP per capita, real annual GDP growth and Inflation rate for macro-economic variables). Their findings show that institutional quality has a positive relationship with bank competition.

Hakam et al. (2013) theorize that liberalization and a constant economic growth stimulates competition and the promotion of the financial innovation. On a national and regional plan, three indicators were set to see whether the policies implemented at different times were in favor of bank competition, i.e. Indicators of structure, efficiency and performance and development and stability. They regressed the H-statistics from the Panzar-Rosse Model against rate of economic growth, credit-gap, stock exchange- gap capitalization, degree of concentration of the three large banks of MENA and rate of inflation. With an adjusted R-squared .79 and level of significance of 10%, all the variables included were statistically significant.

2.3 Ethiopian Banking Industry: an Overview

Many researchers and historians agree that the modern banking of Ethiopia started in 1905 with the establishment of the Bank of Abyssinia, a private company controlled by the British owned National Bank of Egypt. The first nationally owned bank in the African Continent was the Bank of Ethiopia established in 1931 (Belay, 1990 & Befkadu, 1995). The Bank of Ethiopia served as the state bank until the Italian occupation in 1936. Before and after the liberation of Ethiopia from Italy's brief occupation, (1936-41) and (1941-43) respectively, a number of Italian and British banks were in operation. In 1943, however, the 'State Bank of Ethiopia' was established by the then Ethiopian Government. This bank operated as both the Commercial and Central Bank of Ethiopia.

In 1963, the National Bank of Ethiopia and the Commercial Bank of Ethiopia were formed in order to implement the functions of the State Bank of Ethiopia. Up to 1974, state owned financial institutions such as Agricultural and Industrial Development Bank, Saving and Mortgage Corporation of Ethiopia and the Imperial Savings and Commercial Institutions emerged. Private commercial institutions, of which many were foreign owned banks, also performed. The major ones were Banco di Napoli, Banco di Roma and Addis Ababa Bank. In addition, there were several private insurance companies.

As is the characteristics of any Socialist regime, the Derg nationalized all privately owned financial institutions including three commercial banks, thirteen insurance companies and two non-bank financial intermediaries on 1 January 1975. The nationalized banks were reorganized as one commercial bank (the Commercial Bank of Ethiopia), a National Bank (recreated in 1976), two specialized banks, the Agricultural and Industrial Bank and Housing and Saving Bank, as well as other financial institutions such as, Ethiopian Insurance Company and Pension and Social Society Authority, were formed. (Alemayehu, 2006) In this period, the National Bank of Ethiopia was actively involved in directly controlling of all financial institutions by fixing both deposit and lending interest rates and foreign exchange and credit allocation. (Alemayehu, 2006).

In their extensive recount of the early post 'Derg" period, Bezabeh and Desta (2014), assert that the then Commercial and Development Banks of Ethiopia were run to insolvency with non-performing loans. Several of the initial reforms made active by the current government, in the attempt of enhancing economic growth through financial development, included clearing the non-

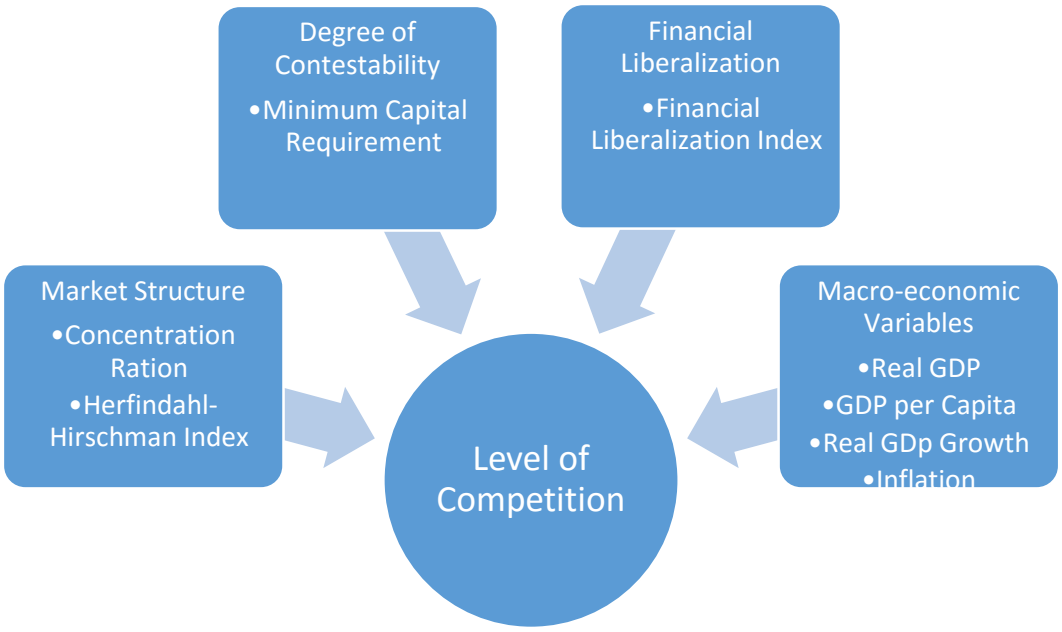
performing loans off of the above mentioned two banks, strengthening the credit risk and portfolio management of Commercial Bank of Ethiopia, issuance of Proclamation No 591/2008 which clarified the role of the National Bank of Ethiopia as the supervisor and regulator of the banking sector and issuance of Proclamation No 84/1994 which legalized domestic private investment in the banking sector.

The issuance of the Proclamation No 84/1994 paved way to the establishment of Awash Bank in 1995, Dashen Bank and Bank of Abyssinia in 1997, Wegagen Bank in 1998, United Bank in 1999, Nib International Bank in 2000, Cooperative Bank of Oromia in 2005, Lion International Bank in 2007, Zemen Bank and Oromia International Bank in 2009, Buna International Bank and Berhane International Bank in 2010, Abay Bank in 2011, Addis International Bank and Debub Global Bank in 2012 and lastly, Enat bank in 2014. There are now 16 commercial banks and one cooperative bank operating in Ethiopia.

2.4 Conceptual Framework

The empirical evidence suggests that the level of competition of commercial banks is influenced by the market structure, degree of contestability of the market, the financial liberalization of the industry, and macro-economic factors.

Figure 1 – Relation between Level of Competition and its Determinants



Chapter Three

3. Research Methodology

This chapter discusses the data used, the technique used to analyze the data and the methods employed to meet the objective set for this research.

3.1 Sample Design

Initially the research was intended to use the entire number of commercial banks in the Ethiopian banking industry. However, to observe the change over the period of time the banks have been reduced to the ones that have operated for the fiscal year (2000-2015); Commercial Bank of Ethiopia (CBE), Awash International Bank (AIB), Dashen Bank (DB), Bank of Abyssinia (BoA), Wegagen Bank (WB), United Bank (UB), and Nib International Bank (NIB).

3.2 Data Type and Collection Method

Given the time period of (2000 - 2015) and the number of banks taken, the number of observation becomes 112 for a panel data. The data used for this research is a secondary data type. Financial statements are collected from the sample banks' annual report and from the NBE. Other information that are helpful to the analysis of the regression function employed will also be collected from NBE.

3.3 Data Analysis Method

Microsoft Office Excel is used for the descriptive description of the data and E-views 9.5 Student Version software is used for the analysis of the regression function.

3.4 Model Specification

The models employed in this research are intended to assess the Ethiopian Banking sector, to measure the level of competition and the determinants that affect the level of competition in the banking industry of Ethiopia.

3.5.1 Assessing the Ethiopian Banking Sector

Following the examples of Demirguc-Kunt & Pería (2010), assessed the banking sector in terms of contestability and bank spread, and Eshete et al. (2013), who used Concentration measures and Profitability indicators.

Demirguc-Kunt & Pería (2010) insist that an assessment of competition in the banking sector ought to include the assessment of the barriers or restrictions of entry and exit in that sector. It is indeed acknowledged that one of the characteristics of perfect competition is the lack of barriers for entry and exit in a particular sector. Hence, it is safe to deduce that contestability is one of the determinants of the existence or absence, thereof, of competition in a given industry or sector; which in our case is the banking sector of Ethiopia. Although an assessment of contestability ought to include both the de jure and de facto of the regulations, what is discussed is only the 'on paper', according to the law, aspects of contestability.

Bikker and Haaf (2002) assert that CR_k and HHI are the best measures of concentration. These indices are used to measure the market concentration. Concentration Ratio is calculated by summing the market shares of only a number of the largest banks. The formulae for the index is expressed as;

$$CR_k = \sum_{i=1}^{k} s_i$$

Where CR_k = concentration ratio of the largest banks

S_i = Market Share of a bank

K= number of the largest banks included

The Herfindahl-Hirschman Index (HHI) uses the information of the banks in the sector rather than a few selected banks as is in the case of CR. The formulae for the index is expressed as;

$$HHI = \sum_{i=1}^{n} s_i^2$$

Where HHI = Herfindahl-Hirschman Index

N= total number of banks

S_i^2= square of the each banks' market share

According to Bikker and Haaf (2002), the HHI ranges between the reciprocal of the number of banks in the sector and unity. A minimum value would indicate that the banks in the sector are of equal size while a unity would indicate monopoly.

Following the examples of Eshete et al (2013), selected performance indicators are used to assess the market. The selected key performance indicators are services and efficiency, profitability, capital and reserve, corporate governance, and information technology.

3.5.2 Measuring Level of Competition; Panzar- Rosse Approach

As briefly discussed in the review of literature, the Panzar Rosse Approach is one of the methods used to measure the level of competition in the so called Non-structural Approach of measuring competition. The logic behind this approach is the microeconomic function that an output is a function of the fixed and variable inputs, whereby output is explained in terms of revenues and inputs in terms of costs. Given that banks are operating in a long run equilibrium, the change in the factor input price is or ought to be reflected in the revenues earned. The method tries to differentiate the type of competition that exists in the market being tested, i.e., monopoly, oligopoly and perfect competition.

The basic expression of the Panzar Rosse Model as put by Léon (2014) is;

$$\ln(Rev_i) = \alpha + \sum_{l=1}^{L} \beta_l \ln(W_{l,i}) + \sum_{k=1}^{K} \gamma_k Z_{k,i} + \varepsilon_i$$

Where Rev is the total Revenue or Interest income, W_l is the input price and Z_k is a set of control variables. The H statistics is, thereby, equal to the sum of the coefficients of the input prices

$$H = \sum_{l=1}^{L} \beta_l$$

Following the examples of Demirguc-Kunt and Pería (2010), with the misspecification adjustment of Bikker et al (2007) and Bikker et al. (2012) which suggests that using the ratio of interest revenue to total assets could lead to an overestimation of the level of competition and therefore,

advise on using Interest revenue itself as a proxy for output. This has been put to practice by Poshakwale & Qian (2009), Xu et al (2013) and Babić et al (2015), the regression goes as

$$\ln IR_{it} = \alpha_i + \beta_{1t} lnPrF_{it} + \beta_{2t} lnPrK_{it} + \beta_{3t} lnPrL_{it} + \gamma_1 lnTA_{it} + \gamma_2 lnLTA_{it} + \gamma_3 \ln NTA_{it} + \gamma_4 lnDF_{it} + \gamma_5 lnEQA_{it} + \gamma_6 lnRSK_{it} + \gamma_7 OIT_{it} + \varepsilon_t$$

Where IR = Interest Income

PF = ratio of Interest Expense to total funding (proxy for price of average funding rate)

PK = ratio of non-interest expense (Capital Expenditure and Accumulated depreciation) to fixed asset (Proxy for price of equipment/ fixed capital)

PL =ratio of personnel expense to total asset (Proxy for price of labor)

TA= Total Asset (for the size of the banks)

LTA= ratio of total loan to total asset (credit risk)

NTA = ratio of non-interest earning assets to total asset (asset composition)

DF = ratio of customer deposits to customer deposits and short term funding (captures the funding mix)

EQA= ratio of equity to total asset (risk preference across banks)

RSK= ratio of Loan loss provision to total loans (risk)

OIT = ratio of other income to interest income

$$H = \beta_1 + \beta_2 + \beta_3$$

This sum indicates the elasticity of interest revenues to the input prices; presumably, in a perfect competition an increase in input prices will increase marginal cost and total revenue by the same amount making the elasticity take a value of 0. In a monopoly, however, the increase in input prices while increasing marginal cost decreases the equilibrium output whereby decreasing the total revenue by the same amount as the increase in input prices, making the elasticity take a unit

value. The value of the H-statistics runs between 0 and 1, where 0 is Joint Monopoly, 1 is Perfect Competition and any value in-between is Monopolistic Competition.

The result of the Panzar Rosse Model holds true only if the market is in a long run equilibrium which is tested using the formulae for H-statistics but by changing the dependent variable with a logarithm of the Return on Assets ($\ln(1+ROA_{it})$),

$$\ln 1 + ROA_{it} = \alpha_i + \beta_{1t} lnPF_{it} + \beta_{2t} lnPK_{it} + \beta_{3t} lnPL_{it} + \gamma_1 lnTA_{it} + \gamma_2 lnLTA_{it} + \gamma_3 \ln NTA_{it} + \gamma_4 lnDF_{it} + \gamma_5 lnEQA_{it} + \gamma_6 lnRSK_{it} + \gamma_7 OIT_{it} + \varepsilon_t$$

This gives an E-statistics which ought to be equal to zero, in that there should not be a statistically significant relationship between ROA and the input prices.

$$E = \beta_1 + \beta_2 + \beta_3 = 0$$

The problem with this approach is that a long-run equilibrium is a pre-requisite, where a market or an industry is not in a long run equilibrium the results from this approach will be invalid.

3.2.2 Determinants of the Competition

The basic logic behind the theories of Claessens (2009) and the empirical evidences from studies of Delis (2012), Amidu and Wilson (2014) and many others, as to the identification of the factors that affect the level of competition, is reduced to four potential factors. These potential factors are market structure, contestability, financial liberalization, and macro-economy factors. Following Demirguc-Kunt and Pería (2010) in line with other empirical studies, competition can be put as

$$Comptition = f\ (market\ structure, contestability, financial\ liberalization, macroeconomic\ variables)$$

- Competition

The dependent variable is the H-statistic form the Panzar Rosse Model.

- Market Structure

The Structure-Conduct-Performance theory confirms that the structure of the market within which banks operate and compete. Although it doesn't necessarily measure the level of competition, it influences, or determines, the level of competition in the market. As a measure of market structure, concentration ratio of the banks under discussion and share of asset owned by government banks are used. There is expected to be a significant negative relationship between the CR of the seven banks (CR_7) and competition for the decrease of CR_7 would mean that the banks are becoming equal in size with the rest of the banks in the industry which fosters competition and vice versa. The share of asset owned by government banks is also expected to have a negative relationship with competition because governments banks usually have the upper advantage in the sector and also the lion share in assets, loans and deposits; a decrease in those shares would mean that the other banks in the sector are arising to the challenge of actually contending for the shares of the government banks.

- Contestability

The absence of entry and exit barriers increases competition such that, according to Demirguc-Kunt and Pería (2010), the threat of entry and exit exerts pressure on incumbent banks. Therefore the less the regulation for entry and exit the higher the competition. The variable of minimum capital requited will be used to measure the threat of entry to and exit from the banking sector. The more contestable a sector is the less there are barriers for entry and exit which fosters competition. Therefore, there is a significant positive relationship expected between contestability and competition.

- Financial Liberalization

The less the interference of the government and the higher the rate of freedom of the market for participants to act freely, the more will be the competition. Financial reforms induce the level of competition in a given market. Financial Reform index of Abiad et al (2010), as was used by Delis, is used to gauge liberalization by assessing credit controls and reserve requirements, aggregate credit ceiling, interest rate liberalization, capital account transaction, and privatization. There is expected to be a positive relationship between competition and financial liberalization.

- Macroeconomic variables

Factors that affect the performances of all the banks in the market are also included; real GDP as a measure of economic development and inflation to gauge the stability of the monetary conditions.

The regression function then becomes;

$$H - stat = \alpha + \beta_1 CR_7 + \beta_2 HHI_{TA} + \beta_3 lnminCapreq + \beta_4 finlib + \beta_{10} lnrealGDP + \beta_{11} lnGDPpercapi + \beta_{12} Inflation + \varepsilon$$

Chapter Four

4. Data Interpretation and Analysis

Under this chapter, the findings from the methodologies used, i.e. results from the analysis of the banking industry, results from the Panzar Rosse Approach and the results as to the determinants of competition in the banking sector will be discussed.

4.1 Assessment of the Ethiopian Banking Sector

Here below; the barriers of entry and exit in the sector are discussed under the subtopic of contestability, the market structure of the sector, measured by two different concentration indices, is discussed under the subtopic concentration and to gauge how the sector has been performing for the period between 2000-2015, selected performance indicators are used which are discussed under the subtopic performance.

4.1.1. Contestability

In order to obtain a license, banks in Ethiopia, in accordance with the rules of NBE, have to submit; a completed application format and other required documentations to NBE with an investigation fee, the founders must then publish their intentions of engaging in a banking business in a widely circulation newspaper, its memorandum and articles of association as a company, the required subscribed shares, the required minimum paid-up capital, background of future directors, financial information on the main potential shareholders, the premises, security arrangements and cash vaults. Upon receiving the information and requirements mentioned above, the NBE grants the license. Foreign nationals and organizations full or partially owned by foreign national, are not only prohibited from opening banks or branch offices but also from owning shares of an already operating bank. The NBE, after granting licenses, dictates the acquisitions of shares, observes the general assembly meetings with in that limits the voting rights. The NBE must approve of appointments of directors and CEOs; with sufficient information it also has the right to remove directors and CEOs from position. The financial obligations and limitations of banks are also set by the NBE.

Although, there has not been any record of commercial banks exiting from the sector, the NBE extensively discusses a certain bank's position in the case of revocation of licenses, receivership, and liquidity.

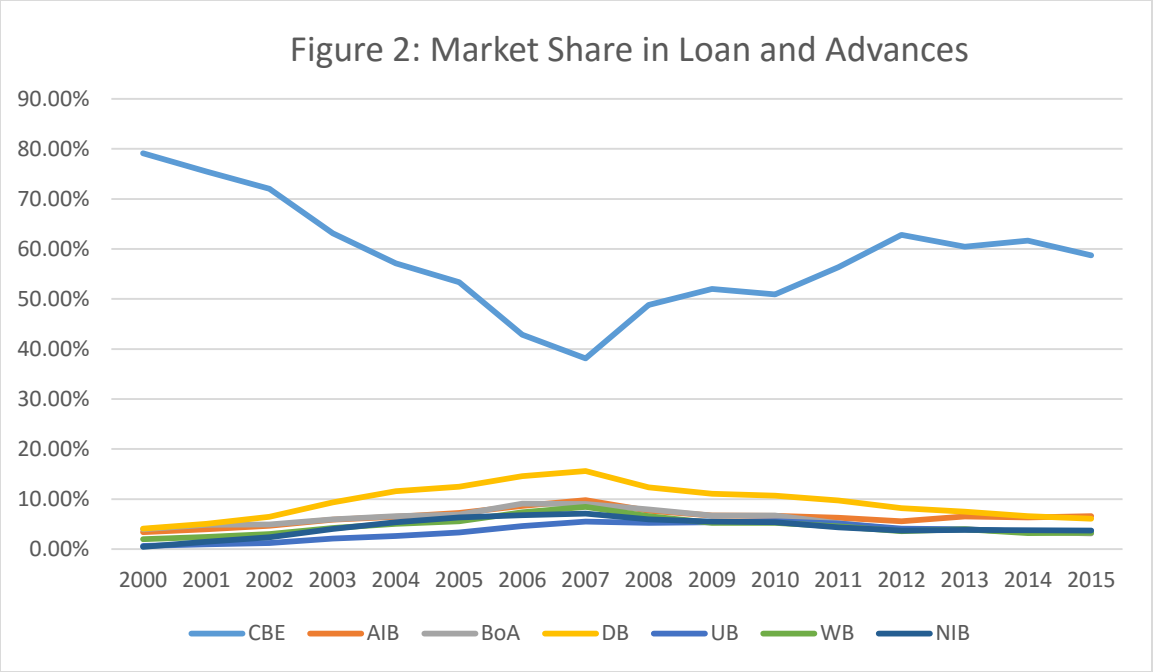
From the above review, it can be said that the National Bank of Ethiopia control activities of the banking industry. As the regulatory body that devices both entry and exit requirements, the NBE has the power of increasing entry and exit barriers.

4.1.2. Concentration

The core existence of any commercial bank is to act as an agent between a borrower and a lender, whereby the borrowers are individuals and legal business entities that take loans from a given bank of their choice and the lenders are commercial banks that use the deposit or savings of their depositors. The two subjects that generally give an overview of a given bank would be its loans and advances that are an important component of its asset and its deposits which are the main object of its liabilities.

a) Market Share in Total Loans and Advances

Loans and advances represent the primary earning asset and the core output of a bank. Loans typically earn the highest yields before expenses. They also exhibit the highest risk and default rates. Loans and advances are extended to customers engaged in different economic sector development in accordance with the banks' policies. Some of the economic sectors that receive loans and advances from commercial banks would include Manufacturing, Domestic Trade & Services, Export, Import, Building and Construction, Hotel & Tourism, Agriculture, Transportation, and Personal.

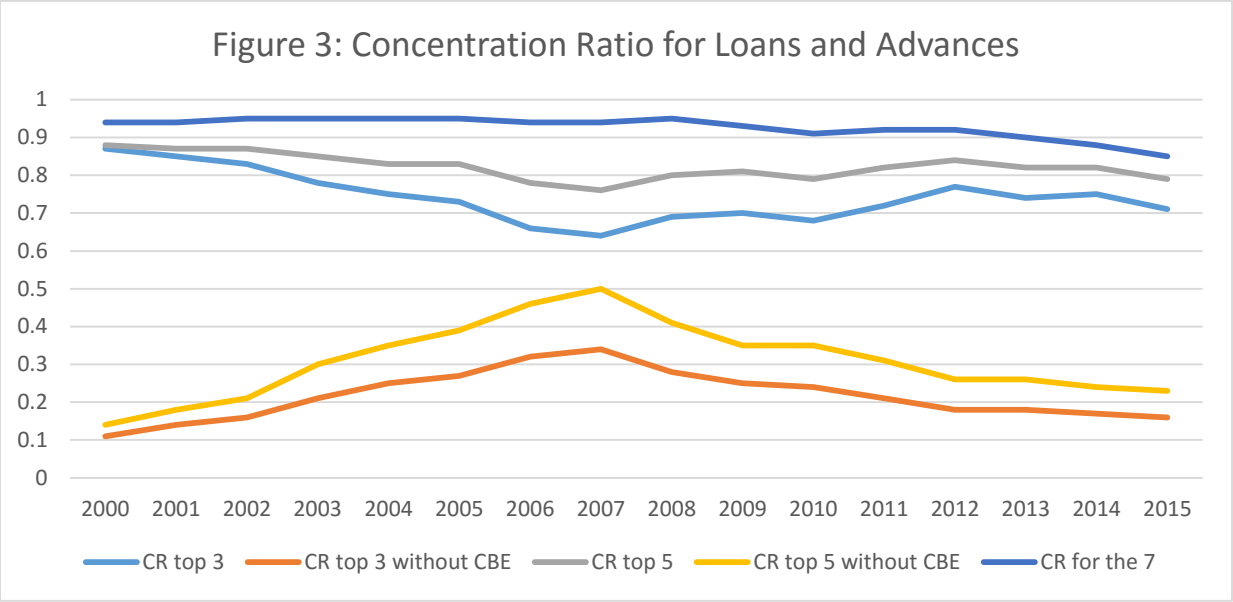


Calculated based on the data from NBE and CBE annual report

From 2000-2007, CBE's market share in terms of loans and advances decreased by an average rate of 9.76%. By contrast, in that same period, the market share of the private banks started to increase i.e. AIB's share by 16.37%, BoA's share by 15.13%, DB's share by 22.63%, UB's share by 36.29%, WB's share by 23.14% and NIB's share by 60.49%; the market share of BoA started dropping prior to the other private banks in 2006.

CBE's market share started increasing from 2008 onwards, showing only a decrease in 2010, 2013 and 2015. The market share of the CBE's average rate of change from 2008 to 2015 is an increase of 6.01%. On the other hand, AIB's market share decreased starting from 2008; by 2015 an increase in the market share was observed. The Bank's average rate of change for the years 2008-2015 was a decrease of 8.6%. BoA's market share started to decrease in 2007 with an increase in 2013, the average rate of change for the years 2007-2015 is a decrease of 9.6%. DB's market share persistently decreased starting from 2008 with an average decreasing rate of 10.35%. UB's market share also started decreasing in 2008 but had an increase in 2009, 2010, and 2015. The average change of the market share of the Bank for the years 2008-2015 is a decrease of 4.78%. WB's market share started to decrease in 2008 but there was an increase in 2013 and 2015; the average change rate for the years 2008-2015 is a decrease of 10.46%. NIB's market share also started

decreasing from 2008 onwards, only increasing slightly in 2013, and the average rate of change for this bank for the years 2008-2015 is a decrease of 7.54%.



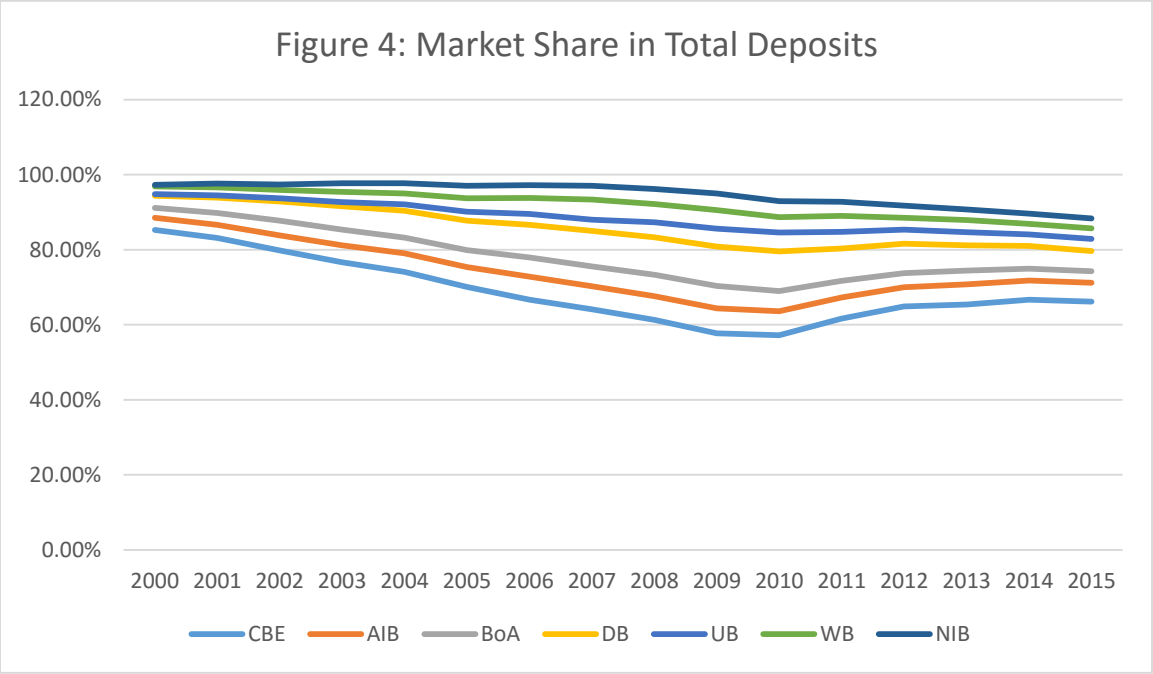
Calculated based on the data from NBE and CBE annual report

The concentration ratio of the seven banks under study was closer to one in value for the first few years but not exactly as such since Construction and Business Bank has been excluded from the study. But as the number of banks increased over the years, although not significantly, the market share of the 7 banks started to decrease. There can be seen a significant difference in the CR with and without CBE and it shows that CBE has a greater influence in the sector. The CR with CBE take the shape of the CBE market share; but not exactly the same for the change of the CBE's market share is compensated by the change in the market share of the top two and four private banks respectively. The CRs without CBE take the shape of the market shares of the private banks.

b) Market Share in Total Deposits

Sustained efforts in mobilizing deposits require good corporate hospitality in creating attractive and conducive benefits to attract customers to deposit in their banks. Abundant available deposits mean more money to lend to customers and thereby increasing interest income which is the main source of income of the banking industry. As can be seen in the above table, banks with high deposits are also the highest lenders. Yearly increase of deposits is attributable for successful

campaign of the banks in mobilizing. More deposits also mean confidence of customers in the banks' performance and management for their invested resources.



Calculated based on the data from NBE and CBE annual report

The above figure, it can be seen from that throughout the past 16 years the market share of CBE has been decreasing as the number of private commercial banks increased, populations trust in the banking sector improved and customers were presented with a choice of dealing with a different bank; the market share CBE had in terms of total deposits decreased over time, from 85.3% in 2000 to 57.2% in 2010 with an average decreasing rate of -3.91%. In 2011, however, the market share jumped to 61.64%; it has gradually increased at an average increasing rate of 3%.

Contrary to CBE, the market share of AIB, BoA, DB, UB, WB and NIB bank increased over the years as the banks grew and their accessibility and the public's trust in them grew. For the last 16 years AIB's market share has been gradually changing at an average increasing rate of 3.16%; its market share had been growing up until 2009 with a minor decrease in 2007. The bank experienced a decrease in market share for the following aside from an increase in 2013. In 2015, of the six private banks under discussion, AIB had the second largest market share.

BoA's market share had a fluctuating increasing rate throughout the ten years (2000-2009) with an average of 8.867%. From 2010 onwards, the bank's market share has been decreasing with an average decreasing rate of 8.06%.

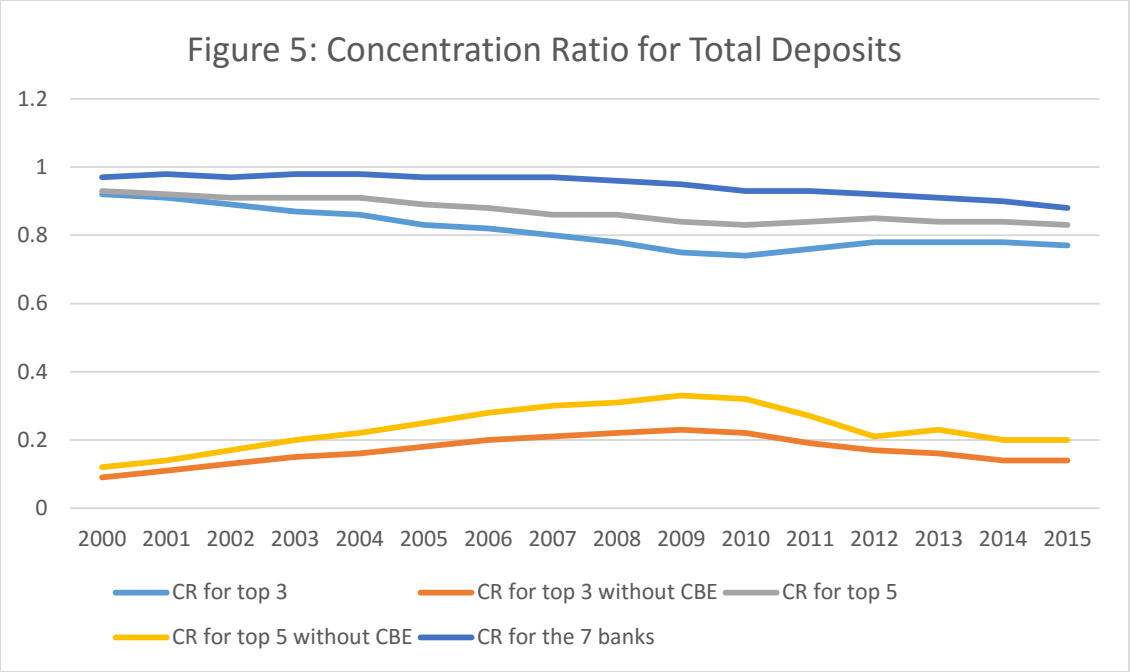
Of all the private banks discussed here, DB had the highest market share up for the years 2000-2015; the market share it held was increasing steadfastly with an average increase rate of 12.76% for the period of (2000-2010). Beginning from 2011, the market share started to decline alarmingly at an average rate of 14.23%.

UB's market share was the lowest of the six from 2000 to 2008; even if the market share had not improved to a greater number, compared to the rest of the banks its decrease has not been that significant either. Until 2010, the market share of UB had been growing at an average rate of 29.39%; from 2000's 0.41% market share to 2010's 4.95%. In 2011, the market share started to decline until 2014's (3.06%) at an average rate of 7.61%. Although by 2015, it had shown a slight raise (3.22%).

The market share of WB was raising from 2000's (2.02%) to 2007's (5.31%) with an average rate of 15.16%, then started to fluctuate in number until 2013. It decreased to 4.83% in 2008, 4.95% in 2009, 4.11% in 2010, 4.33% in 2011, dropped to 3.2 in 2012, then a slight increase to 3.24% in 2013, for the two years after that it continued to decrease with an average rate of 7.14%.

The newest bank of the six private banks is NIB bank. Although new to the sector, its market share had been increasing until 2009 with an average rate of 34.42%. From 2010 onwards its market share started to decline with an average rate of 7.77%.

It can be observed from the above two figures that, as the market shares of the private banks increased the market share of CBE decreased. By 2010, however, when CBE started to gain momentum and its market share started to increase despite the increase in the number of private banks in the sector, the six private banks started losing their market shares. It is important to note that in 2012, all applicants for the Addis Ababa Housing Agency's Condominium Project namely 20/80 and 40/60 were required to pay the said 20 and 40 percent of the housing expense via an account with CBE; which rather gives CBE an unfair advantage in terms of deposits received. Government Agencies and also Universities, pay their expenses, salaries and cost sharing for students with CBE.

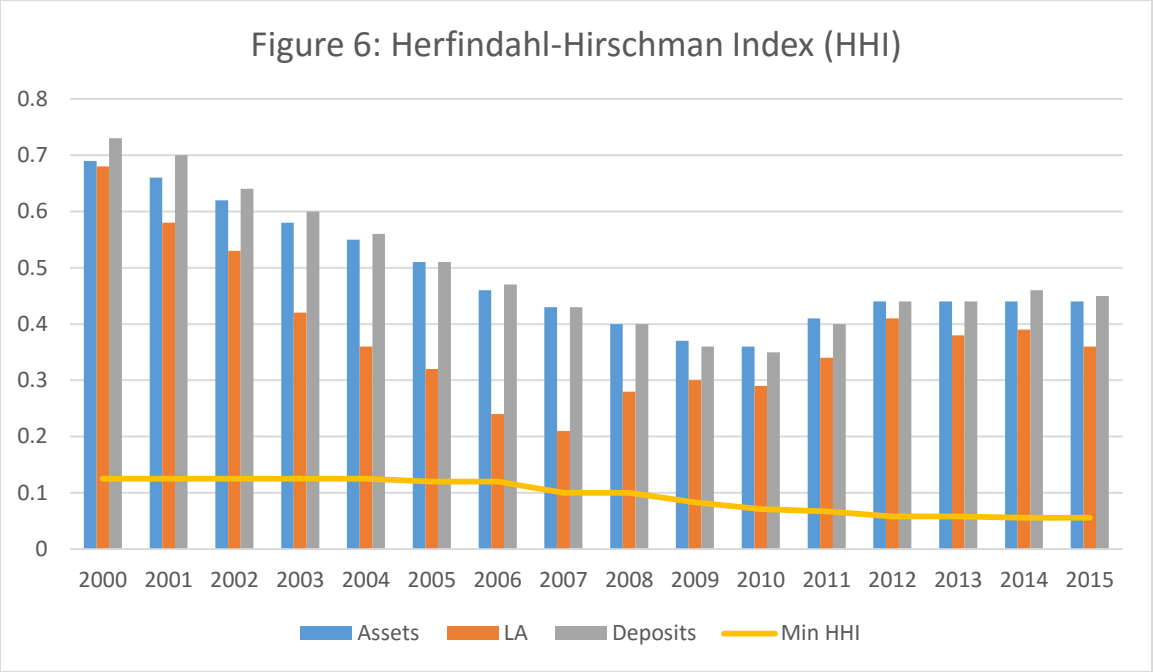


Calculated based on the data from NBE and CBE annual report

Given the above figure, it can be seen that the concentration ratio of the 7 banks is almost 1 between 2000 and 2004 but not equal to for Construction bank of Ethiopia is not included in the study. As the number of private banks increased the CR of the 7 banks started to decrease. It is clear, however, that these banks still dominate the banking sector. When CBE is taken out of consideration, the CR of the top 3 or 5 private banks is not as significant which shows that CBE still holds the monopolistic position in the banking industry. Given the private banks' CR it is evident that they are rather similar in size as their CR is closer to zero when compared to the CR with CBE which is closer to unity showing that the most of the industry is made up of CBE's share alone.

c) Herfindahl-Hirschman Index (HHI)

This is a concentration measure that is used alongside the Concentration Ration (CR). This measurement uses the information of the banks in the sector rather than a few selected banks as is in the case of CR. A minimum value would indicate that the banks in the sector are of equal size while a unity would indicate monopoly.



Calculated based on the data from NBE and CBE annual report

On the above figure, the yellow line across the columns show what the HHI would have been if there were equal sized banks in the sector. The HHI of the earlier years are closer to the value of unity showing a monopoly of sorts. The HHI for Assets decreased up until 2010, the lowest value, and then increased in number only to remain constant from 20012-2015. The HHI for Loans and Advances reached its minimum value in 2007 and started to fluctuate after that. The minimum value of the HHI for Deposits was in 2010 and increased after that only to decrease in slight in 2015. The HHI trend for Assets, Loans and Advances, and Deposits follows the trend of the market share of CBE in terms of all the subsections mentioned afore; that would lead to the conclusion that the sector is rather dominated or monopolized by CBE which is why it is so far off from the minimum possible value of HHI and closer to the value unity.

4.1.3. Performance Indicators

While there could be various different indicators or factors to assess the performance of the banking system, few indicators that could be considered as key performance indicators [KPI] are selected mainly by the availability of data. The KPI selected are five as listed below and detailed descriptions follow for each indicator.

1. Services and Efficiency:

Services quality and efficiency among other things depend on types and varieties of bank services and products, service delivery efficiency, easy reachability [accessibility] and approachability of the required bank sites, innovation of banking services provided to attract customers and customer relations as was discussed by Claessens (2009).

All the commercial banks six private selected provided the important functions of Core Banking Services (CBS) such as deposits and loans and other services which are related to payment systems and other financial services. Other functions of Agency functions such as to collect and clear cheques, dividends and interest warrant; to deal in foreign exchange transactions, etc. and Utility functions such as to provide money transfer facility, to issue travelers cheques, etc.

Throughout the years the number of branches spread in the city Addis Ababa and outside the capital; availability enhances for customers to use their banks without time and travelling costs. The banks with larger number of branches are assumed to have a better advantage of in reaching their customers.

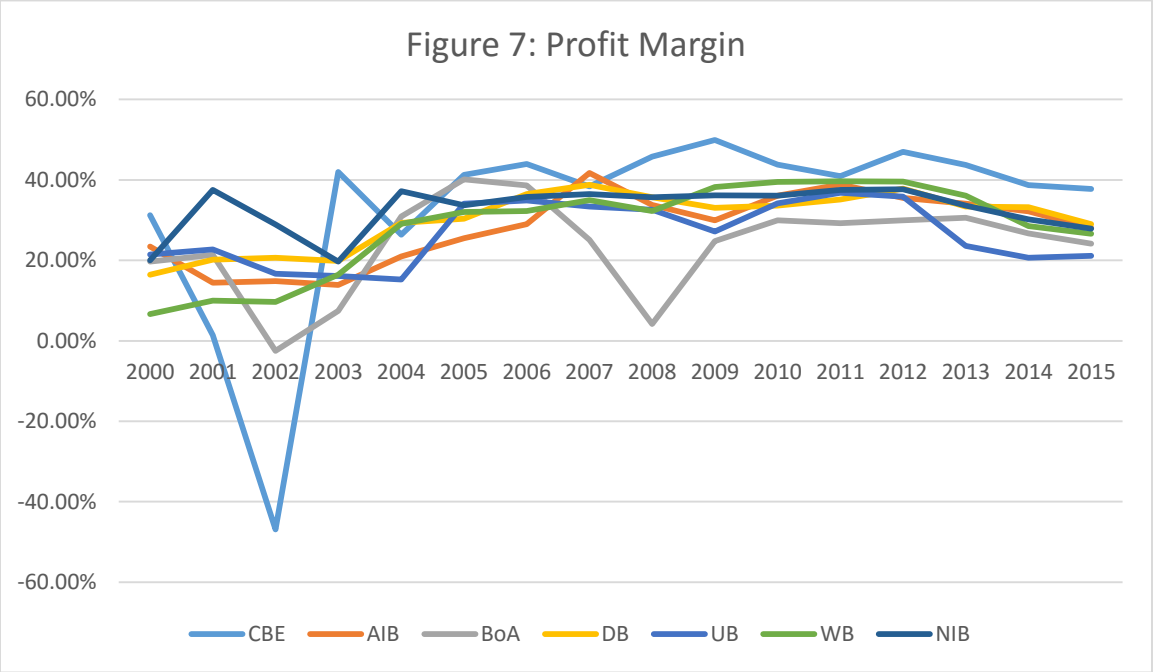
Providing the latest innovations and introducing new products and services to the market helps to attain customers' satisfaction. In the banking industry of Ethiopia, there is a rather cooperative existence among banks and there is no long lasting advantage from introducing an innovation first. On the top of the above, customer relations and corporate hospitality are crucial for customers' satisfaction. Efficiency has also to be pursued for processing products and services to customers demand. (Annual Reports of the Banks)

2. Profitability

Profitability of the banks is measured by analyzing selected financial data as depicted in following subsections.

a. Profit Margin

Profit Margin, which is attributable to the bank, is also a measurement of profitability by a bank. A high profit margin implies the high performance of a bank. It implies that a bank is advantageous having low marginal cost of operation. Profit Margin is calculated net income after tax of the bank over total income.



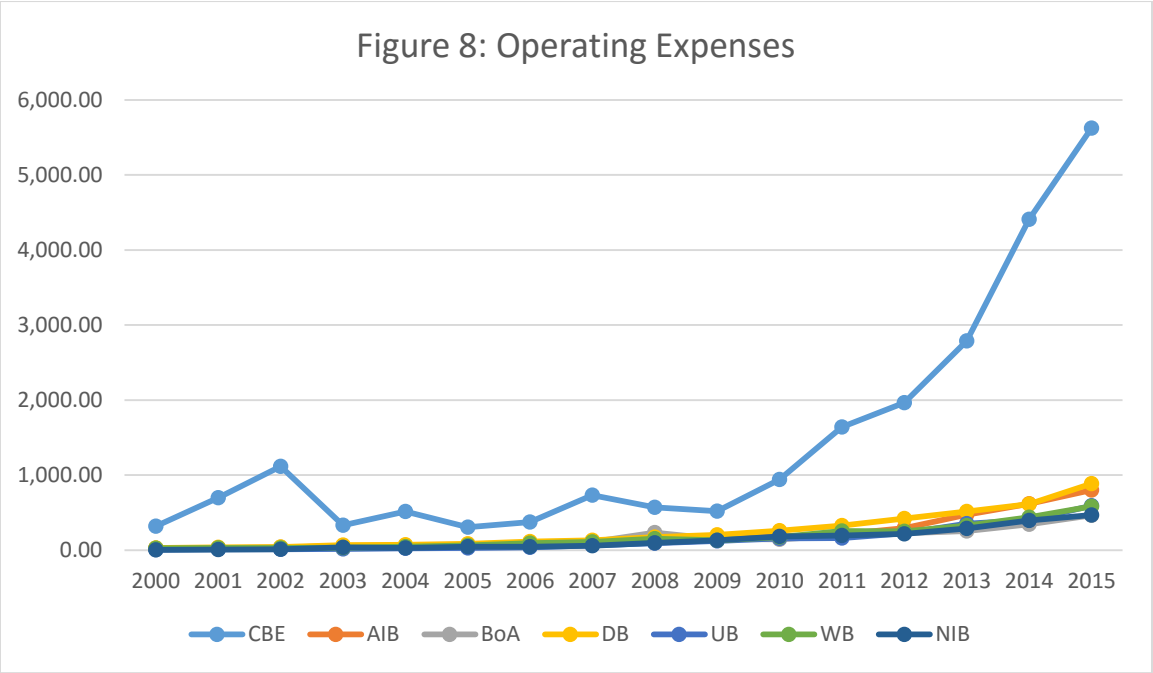
Calculated based on the data from NBE and CBE annual report

The Profit Margins of the seven banks more or less moves together although CBE's profit margin is a bit higher than the rest. There were a few outstanding profit margins over the years. CBE had the lowest and the third lowest profit margins over the years and across banks; in 2001 the profit margin of CBE was 1.42% and in 2002 it was -46.915 which could be attributed to high provision for doubtful debts which increased the operating expense thus making the net income lesser. By the following year, 2003, CBE's profit margin soared to 41.99%, the highest for that year, as the bank had managed decrease its provision for doubtful debts significantly. The second lowest profit margin is BoA's 2002 profit margin of -2.5% which is also due to a lower total income than the preceding year and a growing operating expense which resulted a negative net income. In 2001 NIB had the highest profit margin of 37.5%. In 2008, BoA's profit margin dropped to 4.19 % because of high provision for doubtful debt.

b. Operating Expenses:

In order to generate income and profit, banks like other commercial firms have to incur expenses [costs] necessary for their operation of the banks. But costs have to be commensurate [matching] to income generated. That is, lower costs that generate more income, it can be deduced that the

bank is cost effective/efficient. Banks with lower marginal costs are considered as efficient with higher market shares or profits. Some argue that the sole determinant of profit for firms is the marginal cost of that firm. Analysis of the composition of expenses of the banks is necessary to control or maximize expenses for sustainable existence and growth. In the banking industry, manpower costs [in salaries and benefits] most usually consists up to and above 50% of the operating expenses to be followed by office rents, etc.



Calculated based on the data from NBE and CBE annual report

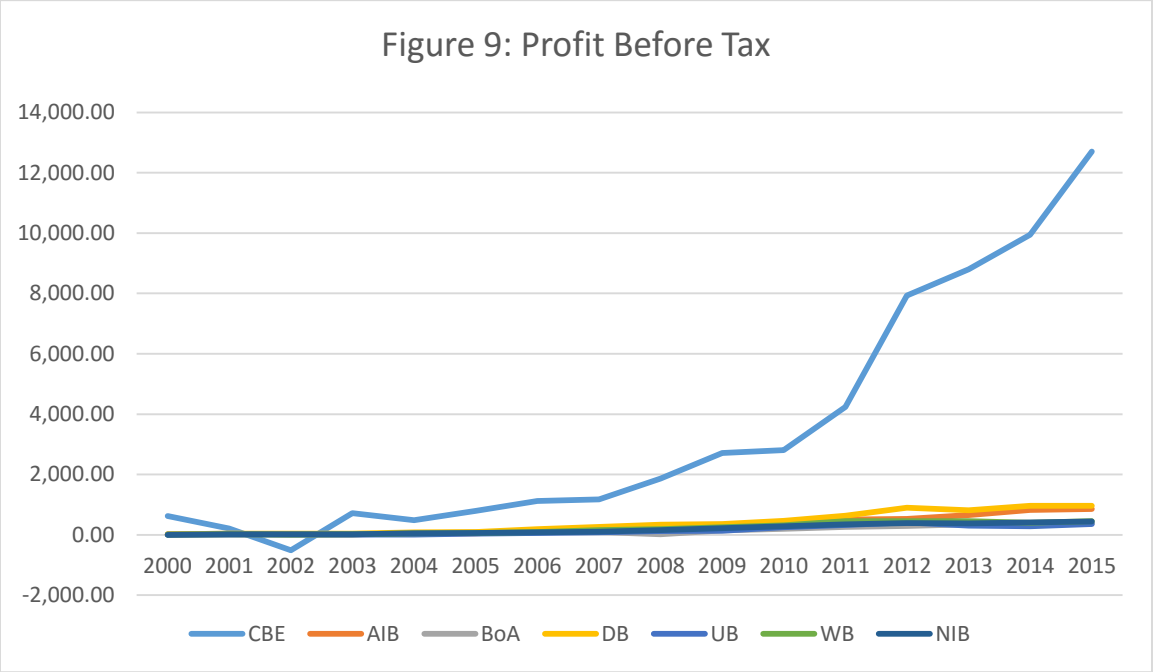
The operating expenses of CBE are increased abnormally in 2001 and 2002 because of the provision for doubtful debts. Between the years 2003-3009, operating expenses were minimal for provision for doubtful debts was kept at a 0 value. Starting 2010, however operating expenses increased as general expenses and provision for doubtful debt started to increase.

The operating expenses for the private banks is huddled together with AIB and DB slightly separated from the rest; which can be attested to the two banks' higher income making it more likely that they would incur a higher operating expense also. The outstanding value of BoA's 2008 operating expenses is attributable to the high provision for doubtful debts incurred that year; 2007's 40.79 million to 2008's 142.77 million to 2009's 22.95 million. WB's 2011 higher than

rate of increase that of the preceding and following year because of a higher value of provision for doubtful debt in the preceding and following year; 2010's 8.5 million to 2011's 40.36 million to 2012's 0.04 million.

c. Profit before Taxes:

Another measurement of profitability is gross profit before taxes. High profit before taxes is the first measurement of successful performance of banks.



Calculated based on the data from NBE and CBE annual report

The Profit before taxes of CBE has grown over the years showing a negative amount only in 2002 where the operating expense, because of a high provision for doubtful debt, was much higher than the total income earned in that same year. Other than that, the bank showed a decreasing changing rate of 16.34% which is offset by the high decreasing rates recorded in 2002 and 2003, with those large aside, the bank had an average increasing rate of 22.69%.

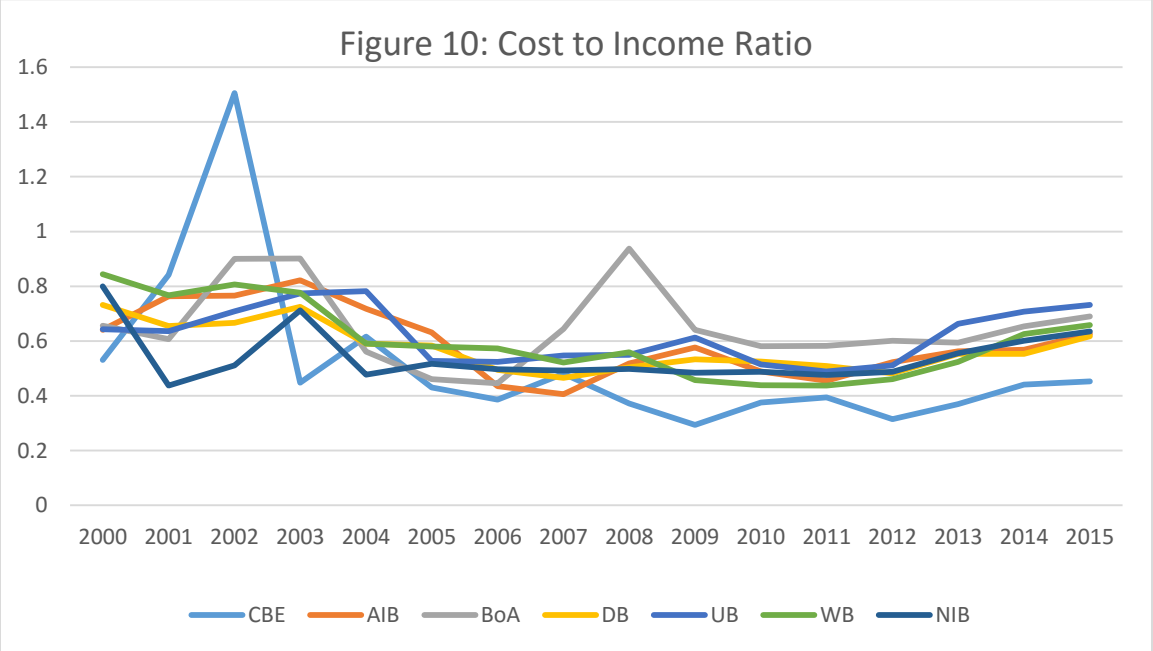
The profit before taxes of the private banks have a similar trend. The banks all started with low profit before taxes, the highest being DB's, AIB's and WB's. After 2011, WB started to slack off and joined the rest of the banks under consideration; making DB and AIB the banks with the highest profit before taxes. BoA's, UB's and NIB's profit before taxes are in close range with one

another, aside from the drop in BoA's profit before taxes of 2008 which is attributable to the high provision for doubtful debt of that year.

d. Cost-to-Income Ratio:

Cost-to-income ratio helps to analyze how low the marginal cost of a bank is. Lower percentage mean higher profit margin for a bank. One year data alone may not tell cost effectiveness whether a bank is operating with high or low costs consecutively in comparison to revenue generated for various reasons. However this has to be analyzed on consecutive years until cost to income stabilizes or matching is reasonable.

As discussed in theoretical discussion on the meaning of competition, etc., the Boone indicator tries to measure the intensity of competition in a given market. The theory behind this approach is that lower costs lead to either decrease in output price or higher profits or somewhere in between. Under this approach it is assumed that quality is similar for firms in an industry or is there an attraction for innovation for it can be easily imitated. Hence, the more efficient firms, or firms with the higher profit or high market shares, gain profits at the expense of the less efficient, the firms with lower profits. It goes, therefore, that the sole determinant of profit for firms is the marginal cost of that firm.



Calculated based on the data from NBE and CBE annual report

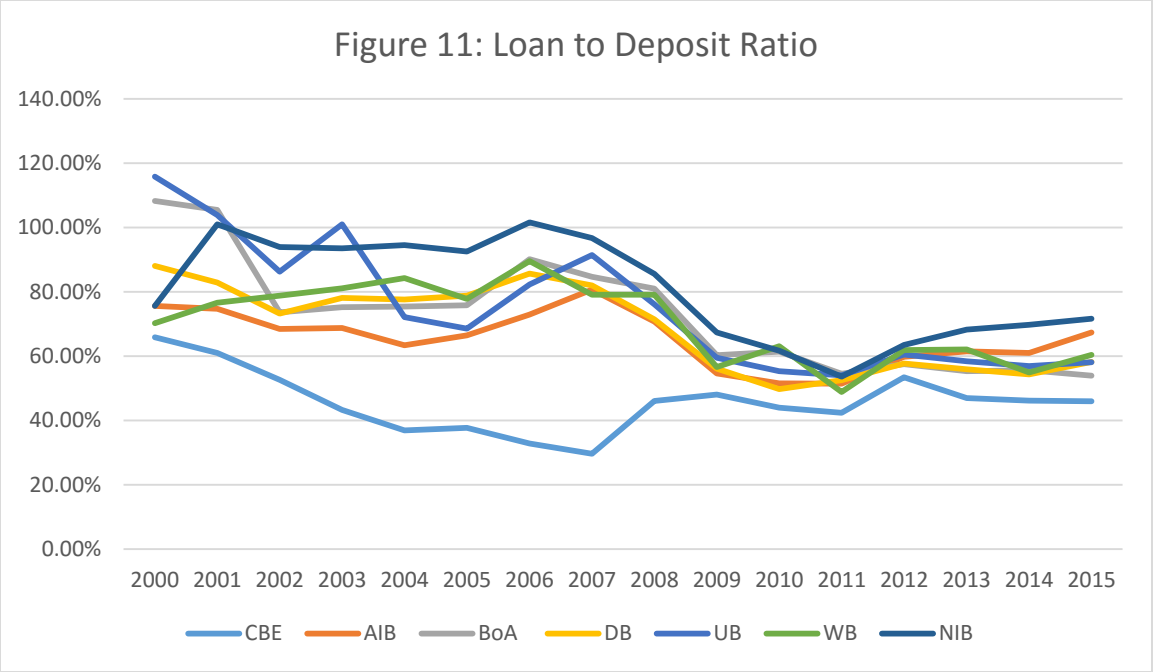
The cost to income ratio of these banks clearly mirrors what has been shown in the profit margin section. It has been mentioned above that a given bank is better off with a lower cost to income ration and worse off otherwise. As can be seen in the figure, the cost to income ratio of the banks are quite similar with a few outstanding points across banks and through the years. In 2002, CBE's cost to income ratio was the highest due to the high provision for doubtful debts and the same goes to the cost to income ratio of BoA in 2008. In contrast, NIB had the lowest ratio in 2001 due to a higher change in income generated. Starting from 2008, CBE had the lowest ratio compared to the other banks that had a ratio that was huddled together.

e. Provision for Doubtful Debts

Provision for doubtful debts is also called Impairment Loss on Loans and advances. A loan loss reserve/provision is maintained by the bank to cover future expected loan losses. It is a noncash expense that indicates management's estimate of potential revenue losses from problematic loans. Increases in provisions thus lower reported net income. It is important, therefore, that banks have low amounts as much as possible and should not exceed the limits as stipulated by NBE regulation. As per NBE's Directives No. SBB/43/2008, provisions of doubtful debts are calculated based on five loan categories or classification specified i.e. Pass, Special Mention, Substandard, Doubtful, and Loss.

f. Loans and Advances to Deposit Ratio

The Loans and Advances to Deposit Ratio is one used to measure the liquidity of bank. As the name indicates it is the ratio of total loans and advances to total deposits of a bank. A higher value of this ration, put in percentage, would mean that the bank is low on liquidity, there by not having enough liquidity to cover unforeseen fund requirement. If there is a lower value of the ratio that would mean that the bank is not using its inputs (the deposits) to earn a higher revenue (interest income) by extending more loans.

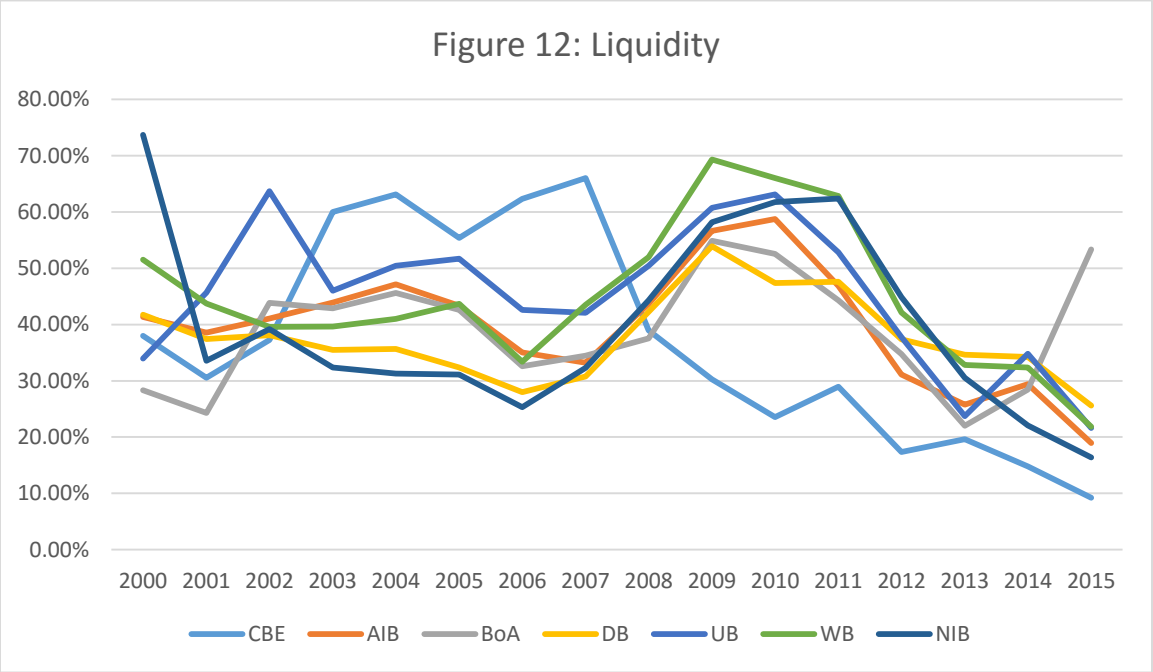


Calculated based on the data from NBE and CBE annual report

It can be seen from the above figure that up until the year 2009, the private banks had a higher loan to deposit ratio compared to CBE; while CBE's average ratio for 10 years was 45.4%, AIB's was 69.65%, BoA's 83.01%, DB's 77.41%, UB's 85.7%, WB's 77.33% and NIB's 90.24%. In order to compete with the rest of the banks, during the first three to four years, private banks such as BOA, UB and NIB were lending more that the deposits they were receiving; on the other hand AIB, DB and WB didn't have to resort to such action which can be attributed to the fact that they were the larger of the private banks. After 2010, the loan to deposit ratio of the seven banks started to move together; by 2015 CBE still had the lowest ratio while NIB had the highest. It can be concluded that there is still room for CBE to utilize the deposits it receives into income generating endeavors.

g. Liquidity

As described in NBE's directives of SSB/57/2014 effective October 1, 2014, it is a requirement that banks have sufficient level of liquidity at all times. In effect, any licensed commercial bank shall maintain liquid assets of not less than fifteen percent (**15%)** of its net current liabilities. In short, the banks are abundantly liquid and there are more rooms to provide credits to business partners. Liquidity is calculated liquid net asset to current liability.



Calculated based on the data from NBE and CBE annual report

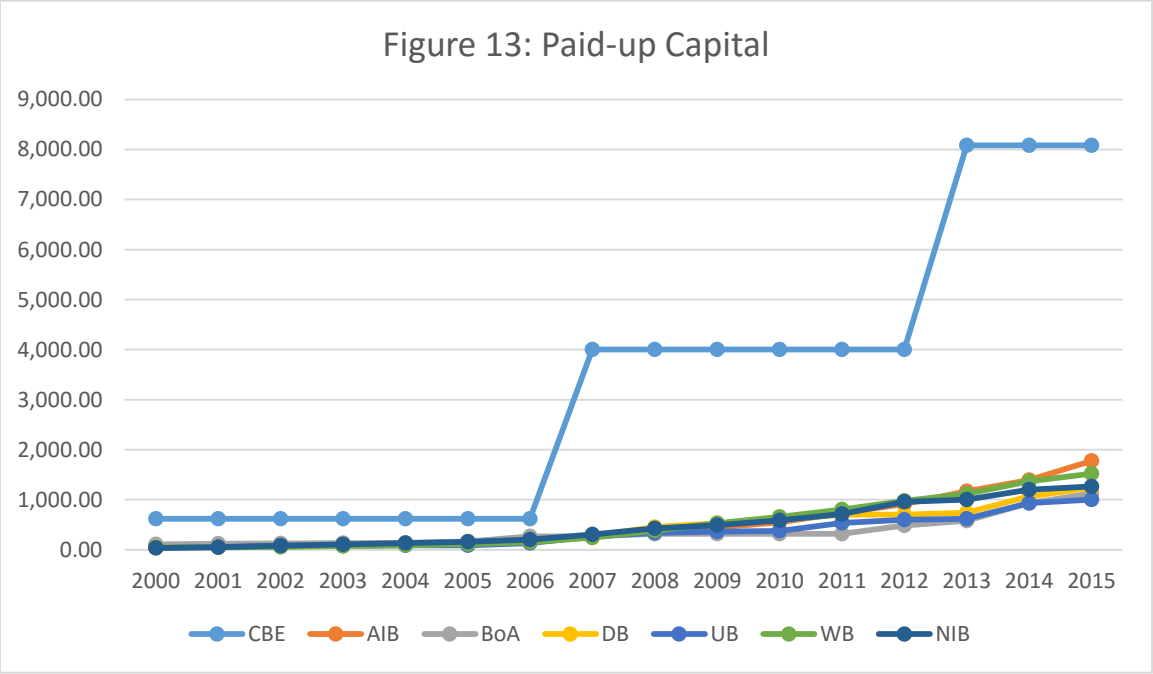
It can be seen from the above figures that the seven banks have had a liquidity well over the requirements of NBE before and after the issuance. However, more excessive deposits imply that more interest expenses not matched by interest income and questions arise whether there is low economic activity for use of available credits. It is evident that the liquidity of the seven banks has fluctuated over the years. It was in close range with one another until 2007 where CBE experienced its maximum value, from there onwards the value started to decrease; by contrast in 2007 the private commercial banks were in lower value of liquidity. After 2007, the private commercial banks' liquidity increased; most private banks, aside from NIB, experienced their highest level of liquidity between the years 2009-2011. CBE is the only bank whose liquidity has been below the requirements of NBE.

3. Capital and Reserve

A large amount of capital is the basis of any business entity including banks for funding their existing operation and expansion. Such capital and use of up-to-date information technology in banking is prerequisite to partner with foreign banks and banking agents, and to plan expanding operation outside Ethiopia. There are indications that some banks are aspiring to extend their

banking operations outside and have reflected this in their visions in their 2014/15 annual reports. For instance, as described in AIB President's message, the possibilities of expanding AIB's operation to East Africa and that the bank's vision was revisited and realigned with new aspirations of becoming "One of the top ten private commercial banks in East Africa". This aspiration is reflected in the Banks's new vision statement to be "First Choice World Class Bank" in 2025. WB's vision statement is "To be one of the ten most respected and competent banks in Africa by the year 2025".

The minimum amount of capital and legal reserve of is determined by the National Bank of Ethiopia. Proclamation No.592/2008 states that a minimum of 25% of any banks' net profit should be transferred to its respective legal reserve at the end of each fiscal year. The reserve requirement as stated in the Directive No. SBB/55/2013 dictates that all banks shall have a reserve of 5% of all deposits at all times. The case of special reserve is stated in Proclamation No.592/2008 to be maintained to make good for losses incurred due to a problem from that arises from the bank or unforeseen events and circumstances. The capital requirement for banks have changed over the years as is the right of NBE to do so which is also mentioned in the Proclamation No.592/2008.



Calculated based on the data from NBE and CBE annual report

The initial minimum paid-up capital requirement for banks to maintain was 75 million birr as per the Directive No. SBB/24/99. The Directive was replaced by Directive No 50/2011 where the minimum paid-up capital was raised to 500 million birr effective September 2011, by then most banks with the exception of BoA had their paid-up capital well over the requirement. Although not available on the NBE's official website, the paid-up capital was raised to 2 Billion in 2015 which was announced on the Annual General Meeting of the shareholders of each bank with the presence of NBE representatives.

4. Organization and Management: Corporate Governance

The organization structure of any private bank hierarchy starts with the General Assembly on top, second comes the Board of Directors, and next comes the President or Chief Executive Officer (CEO) and lastly, the External Auditors. The President is assisted with vice presidents. Then under the President and vice presidents, departments follow in the ladder. Under the departments, there are branches and sub-divisions.

A bank is governed by the Board of Directors responsible for overseeing management's operation and results of the bank, vision, policies and strategies, corporate identity, etc. The board further has standing sub committees responsible in follow up of important functions of the bank. The Board is accountable to shareholders.

The President and its senior management team of department directors are responsible for running the day-to-day operation and administration of the bank. The President and its senior management team are accountable to the Board.

A bank has a head office and branches spread in Addis Ababa and regional towns. The main input resources or asset of a bank's for successful operation are the staff. The listed banks have significant number of staff that offered employment opportunity for the young workforce. The banks invest on staff on continuous basis in training and education to enhance their competence. Staff satisfaction, morale, belonging, honesty and integrity require to be cultivated by the banks for retaining experienced staff and sustained performance results. According to the National Bank of Ethiopia (NBE) 2014/15, the total number of bank branches increased to 2693 from 2208 a year ago.

Corporate Identity: Each bank has symbol(s) for labeling images of their banks that shareholders, staff and Board of Directors share and work to maintain the image. For instance, the Corporate Identity of CBE is "The Bank you can always rely on". CBE has a vision of becoming "world-class commercial bank by the year 2025". DB as indicated in its vision "As Mount Dashen excels all other mountains in Ethiopia, DB continues to prove unparalleled in banking services". Also, there are slogans like "Always One step ahead" or "Dashen Bank, first with so many firsts".

AIB name taken from the Awash River, a most important river in Ethiopia that starts rom the heartland and vanishes in the sands of the rift valley but importantly along its journey waters many farmlands and the source power for the Koka Hydraulic power. AIB's identity as spelled in its vision statement is to be "First Choice World Class Bank" in 2025.

BoA signifying the earliest or oldest bank has in its vision statement "to be the bank of choice for customers, employees and shareholders". WB with its rainbow and star symbol has in its vision statement "To be one of the ten most respected and competent banks in Africa by the year 2025". UB motto is "United, We prosper" and states in its vision statement to be "The Preferred Bank in the Banking industry of Ethiopia". NIB, the name signifying the busy bee, has in its vision statement "To be an icon of excellence and the leading commercial bank in Ethiopia"

5. Information Technology (IT)

All the banks operating under Core Banking System were able to provide products and services on-line to their customers that enhanced customer satisfaction. The stat e-of-the-art in information technology in the banking industry is prerequisite not only to provide all rounded products and services to their customers but also to be competitive in the banking industry to attract more new customers in the business world or even to draw from less efficient banks. With the use of internet, a customer transacts from any end of the country where his bank is available. The banks, in addition to the core banking system that they use, also offer local and international card payment services, international money transfer payments, etc. (Annual Report of Banks)

4.2 Panzar Rosse Approach

The analysis was done for the period of 16 years covering seven commercial banks from the Ethiopian banking sector. The Approach consists two steps whereby, firstly, the expense and control variables are run against the interest revenue.

$$\ln IR_{it} = \alpha_i + \beta_{1t} lnPrF_{it} + \beta_{2t} lnPrK_{it} + \beta_{3t} lnPrL_{it} + \gamma_1 lnTA_{it} + \gamma_2 lnLTA_{it} + \gamma_3 \ln NTA_{it} + \gamma_4 lnDF_{it} + \gamma_5 lnEQA_{it} + \gamma_6 lnRSK_{it} + \gamma_7 OIT_{it} + \varepsilon_t$$

The hypothesis test for this function is; if H=0, it means the sector is in perfect competition. If H=1, it means the sector is in monopoly and if 0<H<1, it would mean that the sector is in monopolistic competition which is a midway between perfect competition and monopoly. The following three tables portray the results from the P-R Approach.

Table 1. H-statistics regression

Dependent Variable: IR_LN_
Method: Panel Least Squares
Date: 05/23/17 Time: 23:32
Sample: 2000 2015
Periods included: 16
Cross-sections included: 7
Total panel (unbalanced) observations: 110

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRF__LN_	0.265503	0.060472	4.390524	0.0000
PRK__LN_	-0.016372	0.033814	-0.484172	0.6293
PRL_LN_	0.371485	0.044561	8.336598	0.0000
TA__LN_	0.996779	0.012744	78.21508	0.0000
LTA__LN_	0.231356	0.079509	2.909823	0.0045
NTA__LN_	-0.062547	0.032918	-1.900084	0.0603
RSK__LN_	0.015163	0.022887	0.662528	0.5092
EQA__LN_	0.043738	0.045181	0.968061	0.3353
DF__LN_	-0.223404	0.243687	-0.916768	0.3615
OIT	-0.375635	0.060266	-6.233005	0.0000

R-squared	0.993769	Mean dependent var	19.36483
Adjusted R-squared	0.993208	S.D. dependent var	1.460710
S.E. of regression	0.120378	Akaike info criterion	-1.309852
Sum squared resid	1.449087	Schwarz criterion	-1.064353
Log likelihood	82.04184	Hannan-Quinn criter.	-1.210276
Durbin-Watson stat	1.076148		

From the above table it can be seen that 99.3% of the dependent variable is explained by the variables included in the regression. The variables price of funding (prf_ln), price of labor (prl), Total Asset (ta_ln), Loan to total asset (lnta_ln) and Other Income to Interest Income (oit) have a statistically significant relationship with the dependent variable at significance level of 1%; while

the variable Non-earning asset to total asset (nta_ln) has a statistically significant relationship with the dependent variable at a significance level of 10%. The rest of the variables don't have a statistically significant relationship with the dependent variable.

H_1: The input prices (price of funding, price of capital and price of labor) don't have a joint significant impact on Interest Revenue. (The market is in perfect competition.)

Table 2- Hypothesis testing H=0

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	10.65959	100	0.0000
F-statistic	113.6268	(1, 100)	0.0000
Chi-square	113.6268	1	0.0000

Null Hypothesis: C(1)+C(2)+C(3)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1) + C(2) + C(3)	0.620616	0.058221

Restrictions are linear in coefficients.

The null hypothesis that the input variables don't have a joint statistically significant relationship with the dependent variable; stated in other words, the hypothesis that the banking sector is in perfect competition is rejected at a significance level of 1%. This shows that the joint percentage change of the prices of funding, capital and labor significantly affects the interest revenue of the commercial banks.

H_2: The input prices (price of funding, price of capital and price of labor) have a unit significant impact on Interest Revenue. (The market is in joint monopoly.)

Table 3 – Hypothesis testing H=1

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-6.516226	100	0.0000
F-statistic	42.46120	(1, 100)	0.0000
Chi-square	42.46120	1	0.0000

Null Hypothesis: C(1)+C(2)+C(3)=1
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
-1 + C(1) + C(2) + C(3)	-0.379384	0.058221

Restrictions are linear in coefficients.

The null hypothesis that the expense variables don't have a joint unit sensitivity over the dependent variable; stated in other words, the null hypothesis that the banking sector is in monopoly is rejected at a significance level of 1%. This indicates that the joint percentage change in the prices of funding, capital and labor do not change the interest revenue of commercial bank by a unit.

Before interpreting the results of the above regression, all the above independent variables have to be run against Return on Assets in order to test if the market is in a long run equilibrium; H-statistics will hold true only if the market is in a long run equilibrium.

$$\ln 1 + ROA_{it} = \alpha_i + \beta_{1t} lnPF_{it} + \beta_{2t} lnPK_{it} + \beta_{3t} lnPL_{it} + \gamma_1 lnTA_{it} + \gamma_2 lnLTA_{it} + \gamma_3 \ln NTA_{it} + \gamma_4 lnDF_{it} + \gamma_5 lnEQA_{it} + \gamma_6 lnRSK_{it} + \gamma_7 OIT_{it} + \varepsilon_t$$

Table 4 – E-statistics Regression

Dependent Variable: _1_ROA__LN_
Method: Panel Least Squares
Date: 05/23/17 Time: 23:38
Sample: 2000 2015
Periods included: 16
Cross-sections included: 7
Total panel (unbalanced) observations: 110

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRF__LN_	-0.008180	0.003904	-2.095564	0.0386
PRK__LN_	-0.003843	0.002183	-1.760508	0.0814
PRL_LN_	0.011645	0.002877	4.048409	0.0001
TA__LN_	0.001436	0.000823	1.745141	0.0840
LTA__LN_	0.010578	0.005133	2.060977	0.0419
NTA__LN_	-0.004977	0.002125	-2.342268	0.0211
RSK__LN_	-0.002608	0.001477	-1.765388	0.0806
EQA__LN_	0.007625	0.002917	2.614201	0.0103
DF__LN_	-0.008464	0.015731	-0.538067	0.5917
OIT	0.013769	0.003890	3.539220	0.0006

R-squared	0.507308	Mean dependent var	0.026410
Adjusted R-squared	0.462966	S.D. dependent var	0.010604
S.E. of regression	0.007771	Akaike info criterion	-6.790370
Sum squared resid	0.006039	Schwarz criterion	-6.544872
Log likelihood	383.4704	Hannan-Quinn criter.	-6.690795
Durbin-Watson stat	1.163682		

The main purpose of running the E-statistics regression is to make sure that the expense variables have no joint significant relationship with the dependent variable ROA.

H_3: The input prices (prices of funding, capital and labor) don't have a joint significant relationship with ROA. (The market is in a long-run equilibrium.)

Table -5 Hypothesis testing E=0

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.100520	100	0.9201
F-statistic	0.010104	(1, 100)	0.9201
Chi-square	0.010104	1	0.9199

Null Hypothesis: C(1)+C(2)+C(3)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1) + C(2) + C(3)	-0.000378	0.003758

Restrictions are linear in coefficients.

The Ethiopian banking sector is in a long run equilibrium because we fail to reject the null hypothesis that the expense variables don't have a joint significant relationship with the dependent variable. This assures that the results from the H-statistics regression holds true.

- **Interpretation of the H-statistics Regression**

The interpretation from Table-2 follows that the degree of competition of the Ethiopian banking sector is 0.62 which is between 0 and 1, therefore, it can be concluded that the sector is in monopolistic competition. Table-1 shows that holding other factors constant; as the price of funding increases by 1% interest revenue increases by 0.26% and the relationship is statistically significant at 1%, as the price of capital increases by 1% interest revenue decreases by 0.016% and the relationship is statistically insignificant, as the price of labor increases by 1% increases by 0.37% and the relationship is statistically significant at 1%, as the size of the banks or total assets increases by 1% interest revenue increases by almost 1% and the relationship is statistically significant at 1%, as the credit risk or loan to total assets ratio increases by 1% interest revenue increases by 0.23%, as the ratio of non-earning assets to total assets increases by 1% interest revenue decreases by 0.06% and the relationship is statistically significant at 10%, as the risk of banks increases by 1% interest revenue increases by 0.015 and the relationship is statistically insignificant, as the equity to asset ratio increases by 1% interest revenue increases by 0.04% and the relationship is statistically insignificant, as the funding mix increases by 1% interest revenue

decreases by 0.22% and the relationship is statistically insignificant, lastly, as the ratio of other income to interest income increases by 1 unit interest revenue decreases by 0.37%

4.3 Determinants of Competition in the Banking Sector

One of the assumptions of Gauss-Jordan Linear Regression model is that there ought not be a correlation among the explanatory variables of a regression function. In order to avoid any two highly correlated variables, correlation among the explanatory variables is tested. From the table below it can be seen that the variables lnrealgdp (ln of real GDP) and lngdppercapita (ln of GDP per Capita) are highly correlated and since both are used to measure economic development, the removal of either one of them is necessary.

Table – 6 Correlation

	CR7	HHI_TA	LNMINCAP...	LNREALGDP	LNGDPPE...	INFLATION
CR7	1.000000	0.532252	-0.899846	-0.835918	-0.820386	-0.110400
HHI_TA	0.532252	1.000000	-0.340850	-0.782010	-0.768051	-0.528048
LNMINCAP...	-0.899846	-0.340850	1.000000	0.745680	0.730396	0.118169
LNREALGDP	-0.835918	-0.782010	0.745680	1.000000	0.998753	0.407689
LNGDPPE...	-0.820386	-0.768051	0.730396	0.998753	1.000000	0.412501
INFLATION	-0.110400	-0.528048	0.118169	0.407689	0.412501	1.000000

Having replaced the variable ln of GDP per capita income (lngdppercapita) with the variable real GDP growth (realgdpgrowth), the regression for the determinants of competition runs as follows;

$$H - stat = \alpha + \beta_1 CR_7 + \beta_2 HHI_{TA} + \beta_3 lnminCapreq + \beta_4 finlib + \beta_5 lnrealGDP + \beta_6 realgdpgrowth + \beta_7 Inflation + \varepsilon$$

Table 7- Determinants of Competition

Dependent Variable: H_STAT
Method: Least Squares
Date: 05/31/17 Time: 03:37
Sample: 2000 2015
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR7	2.81E-13	1.56E-13	1.800648	0.1053
HHI_TA	-6.24E-14	2.94E-14	-2.122772	0.0628
LNMINCAPREQ	9.63E-15	3.39E-15	2.842210	0.0193
FINLIB	0.062062	2.02E-14	3.08E+12	0.0000
REALGDPGROWTH	3.11E-15	7.60E-15	0.408852	0.6922
LNGDPPERCAPITA	-6.72E-15	4.36E-15	-1.540644	0.1578
INFLATION	-1.07E-14	1.83E-14	-0.586427	0.5720
Mean dependent var	0.620616	S.D. dependent var		0.000000
S.E. of regression	5.88E-15	Sum squared resid		3.11E-28
Durbin-Watson stat	1.680171			

The results of this regression goes, holding other factors constant; as the value of Concentration Ratio of the seven banks under study increases by 1 unit the value of the H-stat increases by 2.81E-13 unit and the relationship is statistically insignificant, as the HHI of total assets increases by 1 unit the value of the H-stat will decrease by 6.24E-14 unit and the relationship is statistically significant at 10%, as the minimum capital requirement increases by 1% the value of the H-stat increases by 9.63E-15 and the relationship is statistically significant at 5%, as the index for financial liberalization increases by 1 unit the value of the H-stat increases by 0.062062 unit and the relationship is statistically significant at 1%, as real GDP growth increases by 1 unit the value of the H-stat increases by 3.11E-15 and the relationship is statistically insignificant, as the value of GDP per capita increases by 1% the value of the H-stat decreases by 6.72E-15 and the relationship is statistically insignificant, lastly, as inflation increases by one unit the value of the H-stat decreases by 1.07E-14 and the relationship is statistically insignificant.

H_4: The independent variables don't have a joint significant impact on competition.

Table 8- F-statistics

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	2.55E+28	(7, 9)	0.0000
Chi-square	1.78E+29	7	0.0000

Null Hypothesis: C(1)=0, C(2)=0,C(3)=0,C(4)=0,C(5)=0, C(6)=0,C(7)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	2.81E-13	1.56E-13
C(2)	-6.24E-14	2.94E-14
C(3)	9.63E-15	3.39E-15
C(4)	0.062062	2.02E-14
C(5)	3.11E-15	7.60E-15
C(6)	-6.72E-15	4.36E-15
C(7)	-1.07E-14	1.83E-14

Restrictions are linear in coefficients.

All the explanatory variables, together, have a statistically significant relationship with the dependent variable as the null hypothesis is rejected with a p-value of 0. This shows that the variables; Concentration Ratio of the seven banks, the Herfindahl-Hirschman Index, minimum capital requirement, financial liberalization index, real GDP growth, GDP per Capita and inflation have a joint significant relationship with the level of competition of the market.

Chapter Five

5. Findings, Conclusion and Recommendations

This chapter discusses the summary and findings of the research conducted and possible recommendations for future use.

5.1 Summary of Findings

Firstly, the market trend of the Ethiopian Banking Industry was assessed. In order to measure the degree of competition in the banking sector, the Panzar Rosse Approach has been used. The determinants of competition in the Ethiopian banking sector are estimated using the H-statistics from the Panzar Rosse approach and running it against different aspects that could affect the banking sector; the market structure, contestability, financial liberalization and macroeconomic variables.

- The findings of the overview show that the CBE, the government bank, not only has the beginners advantage but also that different circumstances have made it stand out in the banking platform as opposed to the rest of the private banks under discussion. Some of those circumstances are that all applicants for the Addis Ababa Housing Agency's Condominium Project namely 20/80 and 40/60 were required to pay the said 20 and 40 percent of the housing expense via an account with CBE; which rather gives CBE an unfair advantage in terms of deposits received. Government Agencies and also Universities, pay their expenses, salaries and cost sharing for students with CBE. The fact that business owners that plan to import from China can only open and L/C with the CBE, the fact that most of the loans and advances of CBE is to government agencies and/or large business enterprises which enables it to keep its provision for doubtful debts at a minimal.The assessments from the overview of the sector show that in terms of market structure, the government and the private banks show an opposite trend.
- The analysis have found that the Ethiopian banking as measured by the Panzar Rosse approach show that there is a monopolistic competition in the sector.
- Given the results of the equilibrium test, E-statistics = 0, it is to be noted that the sector is in a long run equilibrium.

- The second analysis for the determinants of competition in the Ethiopian Banking sector, the concentration ratio of the seven banks, the Herfindahl-Hirschman Index, the minimum capital requirement, the financial liberalization index, the real GDP of the economy and inflation were found to have joint statistically significant relationship with the degree of competition in the country at 1% significance level. Further, holding other factors constant, the Herfindahl-Hirschman Index, financial liberalization and real GDP of the economy were found to have, separately, a statistically significant relationship with the degree of competition at a significance level of 5%, 1% and 10%, respectively.

5.2 Conclusion

There is high concentration in the Ethiopian banking sector. The comparison among the sample commercial banks have shown that the CBE has a dominant power over the other banks. The assessment has also shown that there is room for further improvement in terms of the degree of contestability as the minimum capital requirement is high. This does not necessarily mean there is lack of competition.

The finding from the Panzar-Rosse approach has shown that the Ethiopian Banking sector is in monopolistic competition. The determinant of competition found from the analysis of the research such as financial liberalization and real GDP ought to be improved to further improve and enhance the level of competition in the industry.

5.3 Recommendation

The banking sector has come a long way in the past 20-25years that registered a continuous growth every year. As evident from the assessment of the banking sector rom a modest of initial capital less than 100 million birr, the private banks' growth soared to paid-up capitals and capital and reserves of 1 billion and 2 billion birr respectively for each bank for the fiscal year ended 2014/15.

It must not be ignored that there is still room for growth for the commercial banks of Ethiopia within the country. Financial development cannot be realized without better access to financial institution. Ethiopia with a population of over 90 million, and a steady, constant economic growth stimulates the promotion of the financial sector, specifically here the banking industry, to expand in the future. All the commercial banks will benefit from this and will generate as in the past stable and robust performances every year under the present normal and stable circumstances. The

Commercial Bank of Ethiopia and the 16 private banks have ample space to compete and prosper in the banking industry.

- The first recommendation, therefore, would be for banks to include the enhancement of their accessibility in their strategic goals. This would not only increase the amount of total deposit of the individual bank, but also enhance deposit mobilization and inject idle money into the monetary cycle.

- Although, the NBE ought to be commended for keeping the financial sector stable and dependable, the financial liberalization index finds the Ethiopian banking sector as Partially Repressed. Some of those regulatory actions are also a draw back on the degree of competition in the sector, the second and last recommendation would be for NBE to release some of its regulatory powers so that the banks in the sector get to compete freely. This would give them the opportunity to work with and use market forces to their advantage, thereby giving them the edge to compete with international banks by 2025, as is the strategic vision of most of the banks under discussion.

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