ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

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MARKET STRUCTURE AND ITS IMPACT ON PROFITABILITY PERFORMANCE OF BANKING FIRMS:

A Case of Private Commercial Banking Sector in Ethiopia

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DECLARATION

I, Abdulwali MohammedKedu, hereby declare that this thesis entitled "MARKET STRUCTURE AND ITS IMPACT ON PROFITABILITY PERFORMANCE OF BANKING FIRMS: A CASE OF PRIVATE COMMERCIAL BANKING INDUSTRY IN ETHIOPIA" submitted by me for the award of the degree of Master of Science in Accounting and Finance of Addis Ababa University, is outcome of my own effort and that all sources of materials used for the study have been properly acknowledged. I have produced it independently except for the guidance and suggestion of the thesis Advisor.

This study is original work and it has not been presented for the award of any other Degree, Diploma, Fellowship or other similar titles of any other university or institution.

Place:*Addis Ababa* Signature:

Date: *June, 2018 G.C.* *Abdulwali Mohammed Kedu*

CERTIFICATION

This is to certify that the thesis prepared by Abdulwali Mohammed entitled "MARKET STRUCTURE AND ITS IMPACT ON PROFITABILITY PERFORMANCE OF BANKING FIRMS" and submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Advisor Dr. P. Laxmikantham Signature _____ Date June 2018

Approved by the Board of Examiners

Examiner (1) _____ Signature _____ Date _____

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ABSTRACT

This paper has investigated the impact of market structure onprofitability performance of Ethiopian private commercial banking firms. The impact of market structure on profitability performance of banks was studied based on the traditional structure-performance hypothesis (SCP) and the efficient-structure hypothesis that explains a positive correlation between profitability and market structure. A panel data of selected eightprivate commercial banks financial statement is used covering the period between 2008/9 up to 2016/17 G.C. The study employed an Ordinary Least Square regression analysis to test the impact of market structure variables (concentrations, market share)and bank specific variables (efficiency, banks size, bank risk, loan portfolio, Age) on profitability performance of banks. The regression test results confirm the significance of concentration and market share to profitability performance of banks. Efficiency, bank size, bank risk, and loan portfoliowere among the factors to alter the profitability performance of banks, whereas Age is found to be the only variable which has negative and insignificant impact on bank profitability.The study findingconfirms that traditional structure conduct performance argument did held in the commercial banking industry in Ethiopia for the period 2008/9-2016/17 G.C.

Since market structure have a significant impact on banks profitability, the management body of banks should have to pay greater attention to expand their market share and they must improve their efficiency.

Key words: market structure, market concentration, market share, bank specific, Efficiency

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ABBREVIATIONS AND ACRONYMS

BS	Bank Size
BR	Bank Risk
CONC	Concentration
CB	Commercial Bank
ESH	Efficiency Structure Hypothesis
EFF	Efficiency
HHI	Herfindahl-Hirschman index
MS	Market share
NIBT	Net Income Before
ROA	Return on Assets
RMP	Relative Market Power
RMH	Relative Market Hypothesis
SCP	Structural Conduct performance
TA	Total Assets
TC	Total Capital

CHAPTER ONE
INTRODUCTION

This chapter of the study begins with the theoretical ground of the study. The details of statements of the problem that the researcher was tried to identify are presented clearly. The intended objectives of the study are also part of this chapter. Significance and scope are also parts included in the chapter.

1.1 Background of the Study

The nature ofimpact of a market structure in which banks operate and the profitability performance of banks has been examined in a considerable number of empirical studies. Following the traditional collusion hypothesis, which is first introduced by Bain (1951) many theoretical and empirical works have been undertaken and tried to affirm how structure of a market affects performance especially in the banking sector.

The traditional market structure paradigm asserts that a concentrated market with lower competitive pressure is more likely to create collusion among participants in the market and results superior profit. Alternative to the traditional market structure hypothesis, relative market power (RMP) hypothesis is given which support thatfirms with relatively bigger market shares and differentiated product lines have a superior market power and use it to set market prices and, thereby, earn an above average profit. Therefore, market share and firm's performance might have a positive relationship. This hypothesis examines how individual firms use their market power through their pricing policy to earn super profit.

The structure of a market and the degree of competition are closely related. Literature based on structural approaches has investigated how the market concentration weakens the market competition by fostering collusive behavior among firms Lalith Seelanatha(2010). The structural approach assesses bank competition by examining measures of market structure such as concentration ratios. The theoretical justification for using concentration as a measure of competition comes from the so called Structure-Conduct-Performance paradigm, which postulates that efficient and larger firms (higher concentration) are more likely to engage in anti-

competitive behavior. Thus, the market structure (industry characteristics) could tell the competitive behavior of firms in a given industry.

The traditional collusion hypothesis has later encountered a competing hypothesis from Demsetz (1973) with a view that market concentration is a result of firms' superior efficiency (firm specific factors) that leads to larger market share and profitability. According to the proponents of efficiency hypotheses, a market may exhibit concentration towards some efficient firms. The cost advantage arising from efficiency of some firms which give rise to concentration may be reflected in better products which satisfy demand at lower cost.

Certainly, the issue of structure-profit relationship has its own policy implications. This is mainly because definitive support for the structural-conduct-performance (SCP) paradigm implies that an active policy aimed at limiting number of firms which increases concentration is an appropriate one. On the other hand policy makers may favor a more competitive environment so as to enhance productivity and efficiency among firms in an industry.

Financial reform measures in the banking and other sectors are recent phenomena in most developing countries including Ethiopia. After 1991, the new government of Ethiopia faced with the twin tasks of reconstructing the economy, and embarking on the transition to a market economy, and this has brought a new era in the financial sector of the country as liberalization and privatization policy and different reform measures are introduced. According to AlemayehuGedas, (2006) "Such measures have made a profound change on the number as well as market share of private banking and a significant change in the functioning of the financial sector". Thus the resulting effect of structural changes and the structure-profit relationship in the commercial banking industry of Ethiopia was the utmost target of this study.

1.2 Statement of the problem

Banks are among the key financial institutions playing a vital role in economic development and growth. The long run survival of banks and their performance has been a concern for policy makers, regulators and investors as well. Evidence from many researches in banking and finance has indicated that banking performance is related to internal and external factors. An important

aspect of assessing the impact of the external environment includes examining the influence of market structure on bank performance.

The structure-profit relation has received a considerable attention in various literatures and empirical studies, especially in banking sectors. A number of studies on structure-profit relationship have been donein the context of developed countries with few works from emerging and developing countries, either of supporting the structure–conduct-performance (SCP) hypothesis or the efficiency structure performance (ESP) hypothesis which provide more weight to the efficiency of individual banks than the concentration by itself as a reason for a higher profitability performance of banks. This paradigm has attributed the structure of a market to the efficiency of some firms.

For example, Tregenna (2009) assessed the effects of several variables such as market structure, bank size and operational efficiency on the profitability of the American banks concluding that there is no strong correlation between operational efficiency and bank profitability rather the main driving force behind bank profitability was found to be concentration. This result is supported by the finding of Maudos and De Guevara (2004) which showed a positive and statistically significant relationship between concentration and bank interest margin. In contrast to these findings, based on the study conducted on state banks in USA, Smirlock (1985) found that market concentration does not explain bank profitability. And also Goldberg and Rai (1996) did not found any positive relationship between concentration and bank performance on their study based on the samples taken from large banks in eleven European countries.

The structural features and the overall conduct and nature of competitiveness in the banking industry could affect the profitability performance of banking firms. In developing countries like Ethiopia, where the financial sector is undergoing major structural transformation in response to various economic and policy transformation, many researches have been conducted explaining the determinants of bank profitability and/or factors affecting bank profitability. However, as per the access and knowledge of the researcher, there is only one study (i.e. Demessie Dea and P. Hrushikesava, 2016) conducted showing the relationship between market structure and performance of Ethiopian Commercial Banks.

In their study, DemessieDea and P. Hrushikesava (2016) have analyzed the effect of concentration and market structure on the efficiency and performance of Ethiopian commercial banks, and they found that performance is positively affected by better technical efficiency, higher market share and large bank size, also reduced market concentration and improved competition will do greater good in perking up the performance of banks. This and the above contrary approaches have left basic question for managers, investors, economic planners and policy makers as to whether industry structure (concentration and market share) or other internal factors (operational efficiency) determine the profitability performance of banking firms. Thus, it is necessary to understand the nature of market structure and its impact on bank performance in order to answer this basic question. Accordingly, this study wasgone through the above stated gaps anditcomes up with valuable insight.

1.3 Objectives of the study

The general objective of this study was to assess the impact of market structure on profitability performance of commercial private banking firms in Ethiopia.

1.4. Research Question and Hypothesis

1.4.1. Research Questions

In order to achieve the objective listed above, the following question would be the focus of theresearch:

- How do market structure variables affect bank profitability?
- What are other factors that affect bank profitability?

1.4.2. Research Hypothesis

These broad research questions were motivated by the following hypotheses:

Market concentration

H0: Market concentration has positive and no significant impact on banksprofitability.

H1: Market concentration has positive and a significant impact on banks profitability.

Market share

H0: Market share has positive and no significant impact on banksprofitability.

H1: Market share has positive and a significant impact on banks profitability.

Efficiency

H0: Efficiency has positive and no significant impact on banksprofitability.

H1: Efficiency has positive and a significant impact on banks profitability.

Bank Size

H0: Bank size has positive and no significant impact on banksprofitability.

H1: Bank size has positive and a significant impact on banks profitability.

Bank Risk

H0: Bank risk has positive and no significant impact on banksprofitability.

H1: Bank risk has positive and a significant impact on banks profitability.

Loan Portfolio

H0: Loan Portfoliohas positive and no significant impact on banksprofitability.

H1: Loan Portfoliohas positive and a significant impact on banks profitability.

Bank Age

H0: Bank age has positive and no significant impact on banksprofitability.

H1: Bank age has positive and a significant impact on banks profitability.

1.5. Significance of the study

Since the study wasaimed at revealing the structural features and its relationship with profitability of banks, it assist the commercial banking firms primarily, and other stake holders such as investors and government to plan in advance and deal with the rising change of the banking environment. The study was also open the issue under study for further and detail investigation for academic scholars as well as for policy makers. Finally, the study as a partial fulfillment, contributed a lot to the knowledge and experience of the researcher.

1.6. Scope of the study

A clear demarcation of thestudy was it only considers the commercial private bank industry of Ethiopia and that have at least ten years data (2008/9 to 2016/17 G.C).This is due to the lack in operating and financial records necessary for this study as most of banks are new with operating history of less than ten years in the industry. The study does involve concentration and market share aspects of market structure. In addition, the study didassess other bank specific variables that could affect banks profitability.

1.7. Limitations of the study

The main limitation of this study emanate from that even if there are many variables that have a relation and an impact oncommercial banks profitability, the study only assessed seven variables (Concentration, Market share, Efficiency, Bank size, Bank risk, Loan portfolio, and Age).

1.8. Organization of the study

The study was organized into fivechapters and the contents in each chapter wereas follows: The first chapter was the introductory part which provides background of the research including theoretical bases and previous studies to introduce the subject briefly. Problem statement, key objectives, scope and significance of the study are also items that were presented in this chapter.

Chapter two was deals with relevant theoretical and empirical ground of the study. The chapter also discusses the definition given for market structure and clarification of some aspects of it.

Chapter three docomprises the methodology that the researcherappliedto carry out the study. Specifically, itincludes study design, sampling design, data source and type, and data analyzing method.

Chapter four contains the results of the empirical tests based on the regression model thatwas used by the researcher.Also the analysis and discussion of the implication of results wasdone in this chapter.

Finally, chapter five covers the summary of the findings of the study, conclusions of the results and the recommendation of the researcher based on the findings of the studyobtained.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter of the study consists of relevant review of related literatures. A brief overview of the subject under study and relevant theoretical clarifications are included in this chapter. Different prior empirical findings and results are also presented in this chapter.

2.1. General overview of Market structure

By structure of any complex body it mean the pattern or form or manner in which the constituent parts of that body are arranged together. Taking the market as a complex 'body', one can examine how its different constituents, i.e., sellers and buyers, are linked together. This can be specified in terms of organizational characteristics which determine the relations: a) of sellers in the market to each other; b) of buyers in the market to each other; c) of sellers and the buyers; and d) of sellers established in the market to the new potential firms which might enter the market. In words of Bain(1959), this means those characteristics of the organization of a market that seems to exercise a strategic influence on the nature of competition and pricing within the market. The following four main features of the market-structure have been suggested by Bain(1959), which are important to understand the concept precisely and to measure it:

1. The degree of seller's concentration: This is the number and size distribution of firms producing a particular commodity or types of commodities in the market.
2. The degree of buyer's concentration: This show the number and size distribution of buyers for the commodities in the market.
3. The degree of product differentiation: This shows the difference in the products of different firm in the market.
4. The condition of entry to the market: This shows the relative ease with which new firms can join the category of sellers (i.e. firms) in the market.

Each of these four different dimensions or features of the market structure were important in determining the behavior of the firms which in turn affects their performance as well as the performance of the industry as a whole. If there is only one firm then we get the form of monopoly market; if there are two, then duopoly; if few then oligopoly and finally if there are

'many' then atomistic market. In each case, the process of output and price determination will be different.

Looking at the absolute sizes of the sellers as another feature of the market structure, there will be interesting problems to find how the large one will be more efficient than the smaller one or vice versa; and taking in to account the size distribution of the sellers in the market, whether the concentrated industries are more efficient than others, Bain(1959).

2.2. Theoretical Literatures

Porter (1979) stated that the distribution of profits for all industry members are impacted by two broad sets of influences:

a) Common industry-wide structural traits such as overall economic growth, and the generalized buyer purchasing behavior for that product. These factors will tend to either raise or lower the average profit potential for the industry as a whole.
b) Profitability of the individual firm will also depend on its market position within its industry and the competitive structure of the market. These structural factors include: the level of competition, the barriers to entry, the firm's growth rate, and its market share.

For the purpose of this study, the discussion was extended to one of these factors which are given as determinant of profitability.

2.2.1.Market structure and profitability

The industrial organization economics (IO) outlook clarifies that a firm's market position within an industry depends principally on the characteristics of the environment in which it competes. Hence, competitive market structure can be thought of as the overarching economic and technical parameters that establish an industry's environmental boundaries, Porter (1979).

Among the various market structure constructs which are studied on their relationship to profitability, the degree of concentration in an industry or market is the significant one. It is defined as Bain, (1951, 1956) as the percentage share of the total industry sales (or some other variable) accounted for by a given number of firms which are concerned. The market

concentration is believed to foster collusion among large firms in the industry which subsequently leads to higher profits.

SCP pointed out that changes in market concentration may have a positive influence on a firm's financial performance Goldberg Lawrence G. and AnoopRai (1996). The traditional SCP theory postulates that exogenous basic conditions determine the structure of a market and that there is a one-way causation flow from market structure, through conduct, to performance. According to this theory, firms operating in more concentrated markets are able to set prices less favorable to the consumer as a result of imperfect competition. The traditional SCP theory is based on the proposition that market concentration fosters tacit and/or explicit collusion among the firms in the industry, corresponding to a low cost of collusion. This view is similar with the premise that the degree of concentration in a market influences directly the degree of competition among firms; the more concentrated the market, the more is anti-competitive behavior.

This relationship between market structure and profitability is viewed from two competing hypotheses. On the one hand, the traditional market structure conduct-performance or collusion hypothesis and on the other hand, the efficient market hypothesis A.M Abu Tapanjeh (2006).The market power explanation has two hypotheses: the structure conduct performance (SCP) hypothesis and the relative Market Power (RMP) hypothesis.

2.2.1.1. Structural Conduct Performance (SCP) hypothesis

The primary approach of examining market structure performance relationship has been known as SCP paradigm which postulates that certain market attributes affect company conduct (behavior) which in turn impact company profitability within the relevant market FarisNasif AL-Shubiri (2010). The Structure-Conduct-Performance (SCP) Paradigm, from IE, states that an industry structure is determined by conditions; hence the competitive environment that results shapes the behavior of firms and determines the overall performance of the players in the industry. The traditional structure-conduct-performance hypothesis is based on the proposition that the persistence superior profits for a given industry or market members is indicative of ant-competitive behavior , and is due to some features of market structure that foster collusion and retard competition among firms in the industry, Bain (1951).

Since concentration facilitates collusive or monopolistic practices, firms in concentrated markets will have the market power to set prices above their marginal costs to earn higher profits than firm operating in less concentrated markets. As explained in the SCP, the market concentration fosters collusion among large firms in the industry which subsequently leads to higher profits, Lalith Seelanatha (2010).

The SCP statement held that market structure (the number and size distribution of firms in an industry) determines market conduct (the way in which the firms in that industry interact), which in turn determines firm performance (profitability). When a market is dominated by few large firms with the existence of high profit levels in an industry, it was evidencedthat the firms in that industry possessed monopoly power, FarisNasif Al-Shubiri (2010). This hypothesis suggests that firms in concentrated markets would be able to extract monopolistic rents by their ability to offer low deposit rates and high loan rate.

A number of empirical investigations especially from the European and American scholars have been carried on the SCP relationship with profitability of banks. Such relationship is tested usually by examining the relationship between profitability and market concentration with a positive relationship indicating non-competitive behavior in concentrated markets, Lawrence G. Goldberg (1996).

From an economic perspective, the significance of changes in concentration levels is the potential effects it might have on the industry's market conduct and performance, Bain (1951). Concentration effects market conduct by influencing the pricing and marketing policies of firms in that industry, Weiss (1971). The more concentrated the market, the greater the degrees of discretion firms have with respect to the pricing policies. The degree of discretion is limited by the force of competition. The higher the concentration, the greater will be the possibility of firms coordinating their pricing policies. Hence, concentration affects both market conduct and market performance. Also, in the absence of product differentiation, and in the short run before entry can occur, the fewer the sellers or the less equal their market shares, the more likely is seller behavior to be monopoly-like, Bain (1956); Weiss (1971).

2.2.1.2. Relative Market Power Hypothesis

The relative market power hypothesis (RMH) bases its notion on the ability of individual firms to alter a given product market. RMP theory is based on the premise that market share rather than concentration (through collusion) leads to market power. It states that firms with large market share and differentiated products are able to exercise market power in the setting of prices above marginal costs. Importantly, only firms with (relatively) large market share benefit from this exertion of market power, independent of market concentration.

Firms' market power with relatively bigger market shares and differentiated product lines may have a superior market power and use it to set market prices and, thereby, earn an above average profit, LalithSeelanatha (2010). Hence, market share and firm's performance might have a positive relationship. Based on the relative market power hypothesis, only firms with large market shares and well-differentiated products are able to exercise market power in pricing these products and earn supernormal profits.

2.2.1.3. Efficient Structure Hypothesis (ESH)

In contrast to these market-power theories, there is also another explanations for the positive relationship between profits and either concentration or market share, that is, of the positive relationship between profit-structure relationship. Demsetz (1973) has attributes the cause for any observed degree of concentration to the efficiency of some firms rather than the structure by itself. This is because efficient firms increase in size and market share because of their superiority in producing and marketing products. The positive relationship between market structures (concentration) and profitability performance is from the greater efficiency of firms with a larger market share, a phenomenon that produces both higher concentration and greater profitability, Abdullah M. Al-Obaidan (2008).

The EMH emerged from criticism of the traditional structural conduct paradigm. It has attributed concentration to the increased profitability and market share of some efficient firms, rather than being a random event. This occurs because increased productivity and profitability enables firms to offer competitive rates on loans and/or deposits, inducing them to gain larger market shares and further increase profitability, Goldberg &Rai (1996).

Efficiency structure hypothesis (ESH), states that efficient firms increase in size and market share because of their ability to generate higher profits, which usually leads to higher market concentration. Thus, the positive relationship between profits and concentration is explained by lower costs achieved through either superior management or production processes. If such banks also gain higher market share and thereby make their market more concentrated, it would appear that concentration leads to higher profits, while in fact both are caused by higher efficiency, Demsetz (1974). Thus, under the efficiency paradigm, the degree of concentration is not considered a reflection of the collusive behavior of banks, but rather a consequence of the superior efficiency of bank firms.

In line with this, it is often suggested that market structure is not exogenously determined, but rather that it is the result of the superior efficiency of a number of the firms in the market. Firms with a comparative advantage in production become larger and obtain a higher market share in the industry, leading to an increase in the level of concentration. In this case, that is, if market share is truly representative of efficiency then market share and profitability may be correlated, but there will be no causal relationship between concentration and profitability, since efficiency drives both profitability and concentration (through market share).

In examining the relationship between market structure and profitability, Berger and Hannan (1993) have developed a model to directly incorporate efficiency in examining the relationship. Previous to the Berger and Hannan (1993) model, the relationship were widely believed to be captured by market share –profit relationship based on the belief that market share will capture the superior efficiency of firms in obtaining a larger market share. The model which simultaneously incorporates the structural-conduct-performance (SCP) and efficiency–structure-hypothesis were acceptable. The General equation of the Berger and Hannan model which most structural-profit relationship studies uses is as follows:

$$P = f(X - EFF, S - EFF, CONC, Z) + e$$

P denotes the measure of firms performance and X-EFF and S-EFF denotes the technical and scale efficiency respectively. CONC represents concentration in a given market. Z is a vector of control variables.

Berger and Hannan (1995) have incorporated direct method of efficiency measures to empirical models based on the argument that market share does not represent overall productivity and efficiency level of firms..

2.3. Empirical Studies

Based on the two dominant paradigms different studies have been forwarded with mixed results supporting the market power theory (the traditional structure-conduct-performance (SCP) and relative market power theories RMP) and (or) the efficiency theory.

Following are certain empirical studies referred by the researcher in relation with the topic under the study. They are listed from the recent to the oldest one, including country specific studies as well as countries panel studies.

Demessie Dea and P. Hrushikesava (2016),were analyzed the effect of concentration and market structure on the efficiency and performance of Ethiopian commercial banks using the secondary data obtained from NBE for the period of 1990-2013 by using three regression models they evaluated the SCP and EFS. The finding of their study showed that performance is positively affected by better technical efficiency, higher market share and large bank size also reduced market concentration and improved competition will do greater good in perking up the performance of banks as it still is observed oligopolistic, concluding that there is statistically insignificant correlation between concentration and performance which did not provide sufficient evidence to reject the SCP hypothesis.

HatemElfeituri (2016),where attempt to investigate market structure, determinants of profitability and competitiveness in MENA economies banking sector. The study covers a period of 1999-2012 and aims to investigate the relationship between market structure and bank's profitability. It also examines whether the bank's performance can be better explained by the structure conduct performance (SCP) hypothesis or by the efficient hypothesis (EH). The findings of this study revealed that the SCP hypothesis is not rejected; emphasizing that increased market power yields monopoly profits.

Njoroge J. Macharia (2016),examined the determinants of profitability of Kenyan commercial banks. In addition the study explored effects of the bank size, adequacy of capital, liquidity, credit risk and operational efficiency on banks' profitability. The study was conducted on 43 registered commercial banks by taking the data of year 2011 to 2015. The study finding was established that there is a negative insignificant relation between bank size, operational efficiency and profitability and a significant negative relation between capital adequacy, credit risk and banks' profitability. It also concluded that poor operational efficiency reduces the profitability of commercial banks.

Ali Mirzaei and Guy Liu and John Beirne(2012),were investigated the effects of market structure on bank profitability in 40 emerging and advanced economies. They primarily found out that bank profitability in relation to market structure is different between advanced and emerging banking markets. First, in developed banking sectors, profitability is positively related to bank market share, implying evidence of market rivalry which is not the case for emerging banking sectors however. Second, in emerging, but not advanced economies, the concentration of large banks is negatively related to bank profitability, indicating that large banks are inefficient. Third, more sales-generating and profit-generating bank finance is found in developed markets but not emerging markets. They finally concluded that the developed banking markets are much more competitive than the emerging counterpart.

Lalith Seelanatha (2010), has examined main structural and performance features of banking industry in Sri Lanka. The regression result pointed out a statistically significant negative relationship between technical efficiency and NIM indicating that efficient banks charge lower net interest margin than less efficient banks. Furthermore, statistically significant positive coefficient identified for SE indicates that in relation to NIM, SE is the main determinant. The Empirical results pointed out that efficient operation of banking firms are vital for having higher profitability with better NIM. The paper has concluded that that high market concentration with small number of large banks in the industry has intensified the competition. The finding is in line with the efficiency structure hypothesis and concluded suggesting that traditional structure conduct performance argument is not held in the banking industry in Sri Lanka and the banks

performance does not depend on either market concentration or market power of individual firms but on the level of efficiency of the banking units.

FarisNasif AL- Shubiri (2010), investigation concerning the relation between degree of concentration in the banking sector and performance of Commercial Banks in Jordan has found that the pretax profit indicator is only partly explained by the variables which he considered as relevant. The results indicate the positive and significant relationship between the NIM as profitability measure and the variables (management of bank's capital (MBC), Bank Risk (BR), Bank's loan portfolio (BLP), expense control (EC), loans to total assets (LNAS) Equity to Total.

EralpBektas (2006), investigated profitability determinants of North Cyprus depository institutions using panel data between 1991 and 1997.The results suggest that neither collusion nor efficient structure hypotheses hold in the North Cyprus deposit market for the period of 1991-1997 and concluding that profitability is not the result of collusive behavior or efficient operation of depository institutions. The implication of this study is the absence of collusion in the sector, reflecting fair pricing of banking services and is taken as good for the economy.

YongilJeon Stephen M. Miller (2005),examined the positive correlation between banking concentration and performance of the market-power versus the efficient structure theories in the U.S banking sector at a state level and the result supporting the market-power, rather than the efficient-structure theory of that positive correlation.

Guru et al. (2002) attempt to identify the determinants of successful deposit banks in order to provide practical guides for improved profitability performance of these institutions. The study is based on a sample of seventeen Malaysian commercial banks over the 1986-1995 periods. The findings of this study revealed that efficient expenses management was one of the most significant in explaining high bank profitability. Among the macro indicators, high interest ratio was associated with low bank profitability and inflation was found to have a positive effect on bank performance.

Mercedes Gumbau and JoaquínMaudos(2000), this study carries out a test of the different hypotheses explaining the relationship between profitability and market structure in Spanish

industry, its principal contribution being the use of a direct measurement of efficiency obtained by application of frontier techniques. The results reject the traditional structure-conduct performance paradigm given that concentration does not positively affect profitability. Also, the evidence obtained implies rejection of the pure efficiency hypothesis given that the magnitude and significance of the market share in explaining profitability remains unaltered when the effect of efficiency is introduced into the estimation.

2.4. Overview of banking system in Ethiopia

A number of historical records has evidenced the 1905 the establishment of first modern bank in the history of the country, Bank of Abyssinia. The bank was owned and managed by the British owned National Bank of Egypt and was given a banking monopoly for fifty years, including the right to issue notes and coins. Following the establishment of this bank, three other banks have come to the banking system soon in the 1910's. Later at the beginning of 1930's, this first foreign owned bank has become under the Ethiopian government is renamed as 'Bank of Ethiopia.

The period of Italian colonization was known for the expansion of more banking firms. Several Italian banks opened branches in Ethiopia during the occupation period. Following the end of Italian colonization, the state owned bank 'Bank of Ethiopia' was established and the Bank of Ethiopia was operating as both a commercial and a central bank until 1963 when it was remodeled into today's National Bank of Ethiopia (the Central Bank, re-established in 1976) and the Commercial Bank of Ethiopia (CBE); AlemayehuGeda (2006). The 1960's was the periods that a number of private banks come to operation. During the 1941-1943 the Britain banks began to take parts in the banking sector of Ethiopia and the Barclay's bank was one of the Britain bank which was in operation during these periods.

After the 1974 popular revolution, the socialist government has taken a number of measures in the financial sector of the country. All banks including foreign owned banks have become nationalized and a central national bank was established. Apart from the establishment of national bank, two other banks were established with special purposes and objectives namely, Agricultural and Industrial Bank and Housing and Saving Bank which operate under the

government ownership and were renamed as Development Bank of Ethiopia and Construction and Business bank.

The structure of the banking sector before the reform period was characterized as a highly concentrated one in terms of ownership, deposit, loan, capital and total assets. This is because only three banks which are totally owned by government were under operation during these periods. At the end of the era the following three banks constitutes the structure of the sector.

- The National Bank of Ethiopia
- The Commercial Bank of Ethiopia
- Agricultural and Industrial Development Bank

Following the downfall of Derge regime in 1991, the new government has engaged undertaking reforms which includes the transition of the economy to the market oriented one and policies to allow establishment of private financial institutions. These financial institutions were reorganized to work to a market-oriented policy framework. Moreover, new privately owned financial institutions were also allowed to work alongside the publicly owned ones. The domestic private sector was permitted to enter the banking and insurance business (foreign financial institutions are not yet permitted to invest) and the response to these reforms has been promising, Tony Addison and AlemayehuGeda (2001).

Total capital of the banking system reached Birr 3,486 million at the end of June 2005, of which Birr 1,979.0 million (56.8 percent) was held by the three government owned banks. The total capital of the seven private banks stood at Birr 1,507 million (or 43.2 percent). Commercial Bank of Ethiopia accounted for about 41 percent of the total capital of the banking system (excluding NBE). However, it is worth to note that the share of private banks both in bank branches and capital has tended to increase over the years as it went up from 37.2 percent and 33.2 percent in 2003/04 to 40.4 and 43.2 percent respectively in 2004/05, NBE (2003).

According the National Bank of Ethiopia - Fourth Quarter Report of 2008/09, the number of banks operating in the country in 2008/09 reached 13, of which nine are private and the remaining three state-owned. All the banks, operating in Ethiopia, have 636 branch banks across the country. The total capital of the banking industry reached Birr 1.1 billion by the end of year

2009. Accordingly, from the total capital of the banking system, the share of private commercial banks is 36.5 percent. The structure of the banking sector has shown significant changes after the reform. Even if the commercial bank of Ethiopia is still the dominant commercial bank in the country, the share of private commercial banks has been increasing since recently.

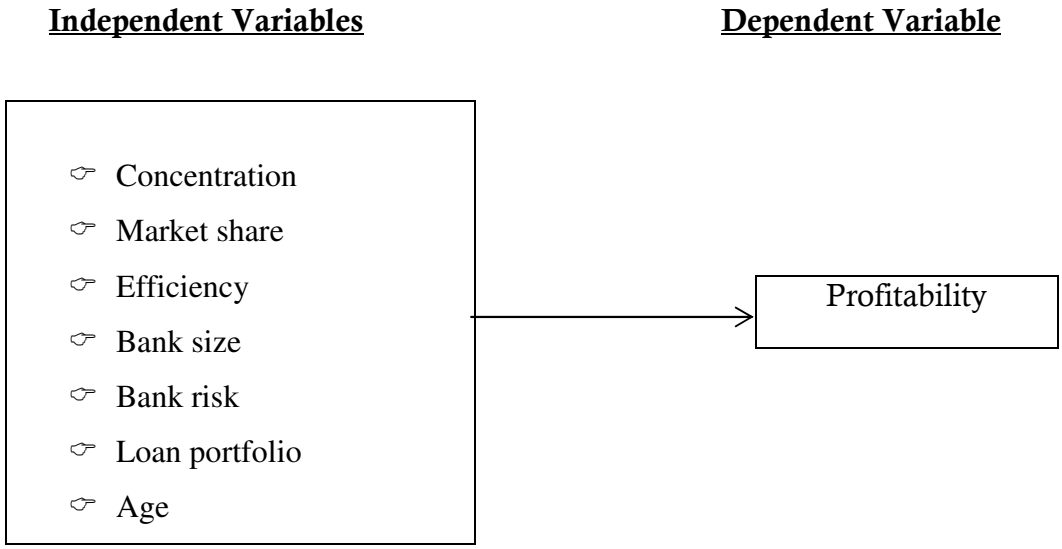
The Ethiopian banking sector is currently comprised of one central bank (National Bank of Ethiopia), two government owned banks and sixteen private banks. Based on the most recent data, Commercial bank of Ethiopia (CBE) mobilizes more than 60 percent of total bank deposit, bank loans and foreign exchange. In 2016, CBE merged with another state owned bank, the Construction and Business Bank. The other government-owned specialized bank is the Development Bank of Ethiopia (DBE). The state-owned DBE provides loans to investors in priority sectors.

2.5. Conceptual Framework

The fundamental framework to test the potential impact of market structure on profitability performance under the structure conduct performance and the efficient market structure hypothesis was designed by Berger and Hannan in 1993. Their methodological frame work was used to test four basic hypotheses. These are the traditional SCP hypothesis, the RMP hypothesis, the technical efficiency hypothesis and the scale efficiency hypothesis.

Figure 2.1: Schematic Diagram showing the relationship between variables

With regard to this study, its conceptual framework is developed from the review of different literature discussed in this chapter and it was presented in the following diagram (figure 2.1). It shows the relationship between the dependent variables (Profitability) and explanatory (bank specific) variables.



Generally, this chapter summarized a review of different related literatures, different empirical studies conducted in relation to the topic under the study. In addition, the conceptual framework of this study was presented in this chapter indicating the impact of market structure variables and other bank specificindependent variables on dependent variable.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter consists of the research methodology that the researcher applied while conducting this study. The sampling and study period, data sources and types are given in detail. It also comprises the approaches and the techniques that were used in the analysis and discussion part of the study.

3.1. Research Design

A researcherconducteddifferent hypothetical relation tests by using an Ordinary Least Square (OLS) model to analyze apaneldata that wasobtained from audited financial statements of commercial private banks operating in Ethiopia that were compiled in NBE for the last 10 years. Hence the study was an explanatory one. Finally, a researcher presents the analysis of regression result and tests of hypotheses by using a descriptive approach.

3.2. Sampling and Study Period

Currently there are eighteen banks which are operating in the country, of which two banks are governmentally owned and the remaining sixteen were privately owned. The target population of the study was the sixteen private owned commercial banks. The two government owned banks, namely Commercial bank of Ethiopia and Development bank of Ethiopia were excluded from the target population of the study. Accordingly, out of the existing sixteen private commercial banks, eightprivate banks wereselected as study sample by using non-probability purposive sampling technique considering the operating period of 2008/9 up to 2016/17 G.C.

The ground behind selecting these eight banks from the total population in accordance with the sampling technique under consideration is based on thefollowing two main criteria's:

- Ownership structure (only private commercial banks wereincluded in the study)
- Time of establishment (only banks who have ten and above year's experiences in the banking operations were included). This is done because the researcher believedthat reasonable time is necessary to look changes in the business of banking and there is lack of operating and financial records necessary for this study as most of banks are new with operating history of less than ten years in the industry.

The following two tables show list of all banks operating in Ethiopia and list of private banks that wasthe sample for the study respectively with their year of establishment.

Table 3.1: List of all Banks in Ethiopia alphabetically.

No	**Bank Name**	**Year Est. (G.C.)**
1	Abay Bank S.C.	2010
2	Addis International Bank	2011
3	Awash Bank	1994
4	Bank of Abyssinia	1996
5	Berhan International Bank	2010
6	Bunna International Bank	2009
7	Commercial Bank of Ethiopia	1963
8	Cooperative Bank of Oromia (s.c.)	2005
9	Dashen Bank	1996
10	Debub Global Bank	2012
11	Development Bank of Ethiopia	1909
12	Enat Bank	2013
13	Lion International Bank	2006
14	Nib International Bank	1999
15	Oromia International Bank	2008
16	United Bank	1998
17	Wegagen Bank	1997
18	Zemen Bank	2009

Source: (NBE, 2017 G.C)

Table 3.2: List of study sample private banks alphabetically.

No	Bank Name	Year Est. (G.C.)
1	Awash Bank	1994
2	Bank of Abyssinia	1996
3	Cooperative Bank of Oromia (s.c.)	2005
4	Dashen Bank	1996
5	Lion International Bank	2006
6	Nib International Bank	1999
7	United Bank	1998
8	Wegagen Bank	1997

Source: (NBE, 2017 G.C)

NB: -Oromia International Bank was excluded from the sample list, because the bank have no prepared and reported financial statements as of 2008.

3.3. Data Source and Type

The main source of data to undertake the study was the secondary sources. Therefore, the data were collected from the audited financial statements (i.e. Balance Sheets and Income statements), different published and unpublished materials and articles. Other means of getting the data wasalso considered, in cases when there is an incomplete data, i.e. directly from the banks.

3.4. Data Analysis

The researcher used anOrdinary Least Squareregression model so as to come up with the direction of impactofmarket structure variables(concentration, relative market share), and different bank specific variables (such as efficiency,bank size, bank risk level, loan portfolio holding, and age) and to explain variation in firm's profitability with respect to structural factors. Moreover, a summary of descriptive statistics and results of regression waspresented and discussed. The Profitability performance measures were estimated on the market structure variables and firm specific factors in the regression model. Finally, the researcher performed the regression model tests to check for the robustness of the model with the regression assumptions.

3.5. Model specification

A general model was developed and tested in order to achieve the desired purposes of the study. The model was aimed at testing the effects of different independent variables on profitability performance that was measured in terms of ROA. The main independent variables in this model were market structure measures (concentration and relative market share) of banks. Efficiency, Bank size, Bank risk level, loan portfolio holding and Age are bank specific variables that were included in the specified regression model. The variable representing profitability of banks wasthe dependent variable in the regression models.

To measure the profitability of commercial banks there are variety of ratios used of which Return on Asset, Return on Equity and Net Interest Margin are the major ones, Murthy and Sree (2003);Alexandru et al., (2008). However, the choice of the profitability ratio was depend on the objective of the profitability measure. The ROA is primarily an indicator of managerial efficiency. It indicates how capable the management of the bank has been in converting the institution's assets into net earnings. The ROE is a measure of the rate of return flowing to the bank's shareholders. This measure of profitability is the most important for a bank's stockholders, since it reflects what the bank is earning on their investment. On the other hand, NIM variable is defined as the net interest income divided by total assets. It focused on the profit earned by on interest activities.

Rivard and Thomas (1997) suggested that bank profitability is best measured by ROA in that ROA is not distorted by high equity multipliers and ROA represents a better measure of the ability of a firm to generate returns on its portfolio of assets. Moreover, ROA is a substantial performance measure for the reason that it is directly related to the profitability of banks, Kosmidou (2008). Accordingly, bank performance in this study was measured by ROA since it showed a better measurement as compared to ROE and NIM and consistent with above writers.

The regression equation wasas follow:

$$P_{it} = \beta_0 + \beta_1 (CONC)_{it} + \beta_2 (MS)_{it} + \beta_3 (EFF)_{it} + \beta_4 (BS)_{it} + \beta_5 (BR)_{it} + \beta_6 (LP)_{it} + \beta_7 (AGE)_{it} + U_{it}$$

Where:

Coefficient of variables and Error term

β_0 = coefficient of Intercept (Constant)

β_1 = coefficient of concentration

β_2 = coefficient of market share

β_3 = coefficient of Efficiency

β_4 = coefficient of Bank size

β_5 = coefficient of Bank risk

β_6 = loan portfolio holding

β_7 = Age of banks

u = The Error Term

Dependent Variable

P: *denotes the profitability performance of banks, which was measured by return on assets (ROA).*

ROA_{it} = Net Income /Total asset

Independent variables

CONC: *denotes concentration in the industry which was measured by Herfindahl Index (HHi) which is the sum of squared market shares of deposits of all the commercial private banks*$[\sum(TDit/TD)^2]$.

MS: *denotes market share which was measured by the ratio of deposit share of each banks to the total deposit in the industry).*

EFF: *denotes efficiency of banks which was measured by the ratio of non-interest expense to net income*.

BS: *denotes Bank size which was measured by natural logarithm of total assets*.

BR: *denotes bank risk level which wasmeasured by the ratio of capital and reserve to total assets*.

LP: *denotes bank loan portfolio holding which wasmeasured by the ratio of loan to total assets.*

AG:*denotes Age which wasmeasured by the number of years of stay in business operation.*

3.6. Definition and Measurement of Variables

The selection and measure of variables in this study was made based on the theoretical grounds underlying the topic of the study as well as from various empirical works. The detail of selection andmeasurement of the variables were presented as follow.

Dependent Variable

Profitability (*ROA*)

ROA wasa key ratio for the measurement of overall bank performance for the evaluation of bank profitability in this study, which is a ratio of income to its total asset.

ROA_{ti} = Net Income / Total asset

Independent variables

Market share (MS)

The generally accepted definition of market share is the ratio of a firm's performance (based on its sales, units, volume, employee share etc.) to the total performance of the server market. Considering the unique feature of bank business, market share in this study was the relative share of banks' deposit to the total deposit in the industry.

$$MS = \frac{Deposit_{it}}{Total\ industry\ Deposit}$$

Concentration (CONC)

Different methods of measuring concentration are used in market structure studies. The measurement of concentration in this study wasthe HerchimanHerfindal Index (HHI) which is the sum of squared market shares of deposits of all the commercial banks.

$$CONC = [\sum(TDit/TD)^2]$$

Efficiency (EFF)

The measurement of efficiency in this study was a relative measure of banks efficiency. The ratio of non-interest expense to net income was the measurement of banks efficiency applicable for the study.

$$Efficiency = Non\text{-}interest\ expense/Net\ income$$

Bank Size(BS)

The inclusion of size as control variable is common in structure-profit studies. A. M Abu-Tapanjeh (2006) has reviewed a number of literatures and related articles to clarify the relevant

of this variable and found appropriate to capture firm's specific factors. The size variable, LTA or the log of total assets controls for cost differences related to bank size and for the greater ability of larger banks to diversify, LawerenceGoldberge (1976). The natural logarithm of assets was the measure of the size of banks in this study.

$$\text{Size} = \ln(\text{Total assets})$$

Bank Risk (BR)

TCA/TA (share capital plus reserves / total assets) was included in the regression analysis to measure the extent of bank risk. A low level of TCAP/TA may reflect a position of high risk and/or high gearing and hence, the possibility of high profits. The risk measure, RISK or the total capital to total asset ratio indicates the level of capital in the bank and can be either negative or positive. This is because higher RISK ratios indicate less capital and greater leverage which could result in increased borrowing costs, leading to lower interest margins (NIM) and profits, LawerenceG. Goldberg (1976). Furthermore, a low level of TCA/TA may reflect a low level of idle funds and correspondingly, high profitability performance.

$$BR = TCA_{it}/TA_{it}$$

Loan portfolio holdings (LP)

From the assets side of the balance sheet, the ratio of loans to total assets (L/TA) is of particular interest, since loans often constitute the biggest portion of funds allocated. In theory, a high level of loans in the balance sheet indicates a high level of risk and correspondingly, it would be expected that L/TA be positively related to profitability, H. SadumanOkumus (1997).

$$LP = \text{Total Loan}_{it} / \text{Total Asset}_{it}$$

Age (AG)

There are studies that includes Age in the measuring the efficiency of banking firms, which wasmeasured by the number of years of firms stay in business operation.

Generally, this chapter of the study summarized the methodological framework that the researcher used while conducting this research. It also presented the details of model and the definition and measurement of both dependent and independent (explanatory) variables.

CHAPTER FOUR
RESULT AND DISCUSSION

This Chapter presents the results of the regression model and their corresponding discussions. Prior to the analysis of regression model, descriptive analysis and test of CLRM assumptions have been done followed by the correlation analysis. Again, analyzes the collected empirical data, the results; and explains the relationship between market structure and profitability of private commercial banks.

For valid hypothesis testing regarding the coefficient estimates and to make data available for reliable results, the test of assumption of regression model is required. Accordingly, the researcher has gone through the most critical regression diagnostic tests consisting of Normality, Multicollinearity, Heteroskedasticity, and model specification and the results are given as follows.

4.1. Descriptive Statistics

Taking the variables used in the models, a summary of descriptive statistics is presented based on data for ten year (2008/9-2016/17 G.C) consisting of eight private commercial banks. The summary of descriptive statistics includes the mean, standard deviation, minimum and maximum values for one dependent variable (ROA) and for all independent variables (CONC, EFF, MS, BS, BR, LP, AGE). The analysis was summarized in Table 4.1 below.

Table 4.1: Summary of descriptive statistics analysis

	ROA	CONC	EFF	MS	BS	BR	LP	AGE
Mean	0.029063	16.0635	38.2075	3.593388	3.908125	13.82313	45.71888	0.7625
Median	0.029	10.53005	34.75	3.245	3.95	12.905	45	1
Maximum	0.049	74.1321	82.7	8.61	4.62	29.79	60.1	1
Minimum	-0.002	0.3721	23	0.61	2.76	7.9	31.35	0
Std. Dev.	0.009723	14.47471	12.30946	1.786324	0.386981	3.664238	6.187095	0.428236
Observations	80	80	80	80	80	80	80	80

Source: *Own computation on Eviews 8*

The *mean* is the sum of the observations divided by the total number of observations. The *median* is the number in the middle. The *standard deviation* is the squared root of the variance. Indicates how close the data is to the mean. N in the table refers to the number of observations per variable. *Min* is the lowest value in the variable. *Max* is the largest value in the variable.

It was clearly indicated in chapter three of this paper that return on asset was used as a profitability measure of Ethiopian private commercial banks for this study, which in turn calculated as a ratio of net income to total asset. As it can be observed from the above table 4.1, the mean value (0.029063) of return on asset determines that on average private commercial banks has been earning 2.9% on their total assets during the study period. In addition, it has a maximum value of 4.9% and a minimum value of -0.2%. These two values indicates that, the sample banks are earning a maximum return of 4.9 cents on each unit of total asset invested and they incur a maximum loss of -0.2 cents on each unit of total asset invested respectively. The standard deviation of 0.009723shows there is no significant variation in ROA among private commercial banksand almost stable and constant on ROA during the sample periods.

Considering the explanatory variables, the descriptive statistics indicates that the variable representing concentration has a mean value of 16.0635 which shows that the industry was concentrated 160.6% on average during the sample study period. Concentration has the highest standard deviation of 14.47471, which indicates that concentration was more fluctuate than any other variables.

The above table also shows Efficiency of a bank has shown a mean value of 38.20 which implies the average efficiency of all eight sample banks. The standard deviation of 12.30946 could be an indicator of differences in relative efficiency among banks in the industry.

The mean value for the market share was 3.593388 implies that on average, individual private commercial banks have been sharing 359.3% of the total deposit of the industry during the study period. The 1.786324 of standard deviation indicates that there is a variation in share of deposit among individual banks during the samplestudy period. The maximum share of deposit with an individual bank is 8.61 which implies at one point in a time during the study period, the industry were concentrated with that degree in terms of share of deposit.

The size of private commercial banks, which is measured as a natural logarithm of their total asset in the industry during the study period ranges from minimum of 2.76to maximum of 4.62. The standard deviation for the size variable (0.386981) is supportive for the smaller variation of size between banks in the industry which was only 38.69%.

On the other hand, loan portfolio of selected commercial banks has a mean value of 45.71888 which indicates that on average private commercial banks have been providing most of their fund through loan. The standard deviation of 6.187095 which shows a high variation of funds provided as a loan by individual private commercial banks.

Lastly, the variable representing age has a mean of 0.7625, indicating on average older banks are 76.25% more profitable than newer banks. In addition, the standard deviation of 42.82% indicates the existence of large deviation in the age of operation between selected private commercial banks.

4.2. CLRM Assumptions and Diagnostic Test

4.2.1. Correlation Analysis

Correlation and regression analysis are related in the sense that both deal with relationships among variables. The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables. For simple linear regression, the sample correlation coefficient is the square root of the coefficient of determination. The correlation coefficient measures only the degree of linear association between two variables.

The analysis of the relationship between dependent variable (ROA) and independent variables (EFF, CONC, BR, BS, MS, LP, AGE) is detailed in table 4.2as follows using the correlation matrixes.

Table 4.2: Correlational matrix of dependent and independent variables

	CONC	EFF	MS	BS	BR	LP	AGE
ROA	0.215453	0.813422	0.263217	0.234882	-0.010362	-0.225796	0.277215

Source:*Own computation on Eviews 8*

The correlation matrix in Table 4.2 shows that the return on Asset (dependent variable) is positively correlated with concentration, efficiency, market share, bank size, and age with a value of 0.215453, 0.813422, 0.263217, 0.234882, and 0.277215 respectively. In contrast, it was negatively correlated with bank risk and loan portfolio with a value of-0.010362, and -0.225796 respectively. From the regression output, it can be said that all independent variables (except efficiency) have a relatively lower relationship (either negatively or positively) with dependent variable of selected banks. Efficiency is found highly positivelycorrelated with profitability by having a value of81%.

The result also shows that concentration, efficiency, market share, bank size, and age are positively correlated to profitability, while bank risk and loan portfolio have a negative correlation with profitability. This implies that larger and older companies that operate in concentrated market tend to be more efficient and theywill have higher profitability.

As concluding the analysis, the selected explanatory variables are found to have a strong and significant relationship with the dependent variable. Therefore, the explanatory variables can explain the dependent variable with a considerable degree.

4.2.2. Test of Heteroskedasticity

Based on one of the main assumption of ordinary least square regression, test of heteroskedasticity was done so as to check whether the variance of residuals is constant or homogeneous. If the assumption of constant variance is violated, the standard errors could be wrong and hence any inferences made could be misleading. In other way, if the errors do not have a constant variance, they are said to be heteroscedastic (Brooks, 2008, p 132). Thewhite's tests of checking for heteroskedasticity problem were used in the study and the results are displayed below.

The hypothesis for the Heteroskedasticity test was formulated as follow;

H0: There is no Heteroskedasticity problem in the model.

H1: There is Heteroskedasticity problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value less than significance level. Otherwise, do not reject H0.

Table 4.3: White test of Heteroskedasticity

Heteroskedasticity Test: White

F-statistic	0.601532	Prob. F(9,70)	0.7915
Obs*R-squared	5.743023	Prob. Chi-Square(9)	0.7653
Scaled explained SS	6.499456	Prob. Chi-Square(9)	0.6891

Source:*Own computation on Eviews 8*

As it can be seen from table 4.3 above, both F-static and Chi-Square versions of the test statisticgave the same conclusion that there is no evidence for the presence ofheteroskedasticity, since the p-values of 0.7915 and 0.7653 respectively were in excess of 0.05, so the null hypothesis do not be rejected. So, this implies that there is no significant evidence for the presence of heteroskedasticity in this research model.

4.2.3. Test of Autocorrelation

Another assumption of CLRM is Autocolleration. If the errors are not uncorrelated (correlated) with one another, it would be stated that they are 'auto correlated' or that they are 'serially correlated'.To check the presence of autocorrelation in this study, the researcher used Breusch–Godfrey test, which allows examination of the relationship between error termand several of its lagged values at the same time.The hypothesis for the autocorrelation test was formulated as follow:

H0: There is no autocorrelation problem in the model.

H1: There is autocorrelation problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value less than significance level. Otherwise, do not rejectH0.

Table 4.4: Breusch-Godfrey test for the absence of serial autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.222025	Prob. F(2,68)	0.3010
Obs*R-squared	2.775593	Prob. Chi-Square(2)	0.2496

Source: *Own computation on Eviews 8*

As it can be seen from table 4.4 above, since the *p*-values of both *F* version and a $\chi 2$ version 0.3010 and 0.2496 respectively weregreater than the significance level of 5%, it can be concluded that there is no autocorrelation problemin the study model.

4.2.4. Test of Multicollinearity

Multicollinearity means that there is a linear relationship between explanatory variables which may cause the regression model biased (Gujarati, 2003, page 342). It is used to check whether there is a linear relationship between explanatory variables included in the model. If such relationship is there, the regression model could be biased. The primary concern for this test is that as the degree of Multicollinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated (Stat: Web Books).

Table 4.5: correlation matrix of independent variables

	CONC	EFF	MS	BS	BR	LP	AGE
CONC	1.000000						
EFF	-0.421601	1.000000					
MS	0.962565	-0.485175	1.000000				
BS	0.370538	-0.291943	0.489718	1.000000			
BR	-0.422529	0.249179	-0.473826	-0.493377	1.000000		
LP	0.005101	0.272143	0.059085	0.240804	-0.188362	1.000000	
AGE	0.538622	-0.538275	0.693077	0.551059	-0.224991	0.093251	1.000000

Source:*Own computation on Eviews 8*

As a rule of thumb, inter-correlation among the independent variables above 0.80 signals a possible Multicollinearity problem, Gujarati (2003).As it can be seen from table 4.5 above, all variables(except between market share and concentration) have low correlation power of less than 0.80, and implyingthere is no strong multicollinearity problem in the explanatory variables selected to determine the impact ofmarket structure on profitability of private commercial banks in Ethiopia. However, the highest correlation coefficient (i.e. 0.96) was observed between market share and concentration. The main reason for such a result is both variables measure the same thing which is market structure, and it indicates banks with higher market share, operates in more concentrated market.

4.2.5. Normality Test

In order to relay on p- values and F-tests so as perform valid hypothesis testing, the model in this study was tested for the normality of data. Normality test of dataset are applied to determine

whether a dataset is well-modeled by a normal distribution or not, and to compute how goodthe random variables are normally distributed. One ofthe most commonly applied tests for normality is the Bera-Jarque (BJ) test. When the p-value given at the bottom of the normality test screen is greater than 5 percent do not reject the null hypothesis, that the data is normally distributed.

The following hypothesis for the normality test was formulated as;

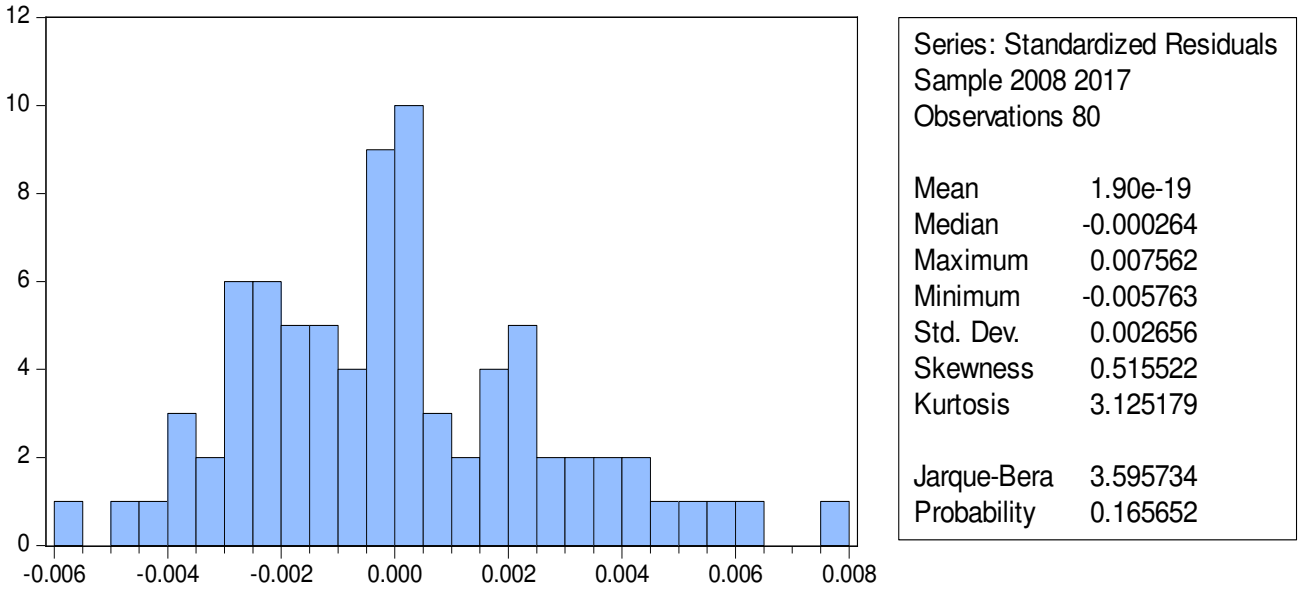
H0: the data is normally distributed.

H1: the data is not normally distributed.

$\alpha = 0.05$

Decision Rule: Reject H0 if P-value of less than significant level. Otherwise, do not reject H0.

Figure 4.1: Normality test



Source:*Own computation on Eviews 8 Test for Normality*

Theoretically, if the test is not significant, then the data are normal, so any value above 0.05 indicates normality. Also, if the test is less than 0.05 which proves significance, then the data are non-normal. As shown in figure 4.1 above, the Bera-Jarque statistic p-value is found to have a value of 0.165652 (greater than 0.05), implying there is no problem of normality. Thus, the null hypothesis was accepted and concluded the residual is normally distributed.

4.2.6. Model Specification test

Usingcorrectly specifiedeconometric model in analysis has an importance of indicating there is no equation specification error and there is no model specification error.The equation specification erroris due to omission of an important variable(s), inclusion of unnecessary variable(s), adoption of the wrong function form, incorrect specification of the error term, and errors of measurement in the regressand and regressors. The results of omitting appropriate variables from a model are the OLS estimators of the variables retained in the model are biased and inconsistent. In addition, the variances and standard errors of these coefficients are incorrectly estimated. In other way, including irrelevant variables in the model is also makes the estimated variances tend to be larger than necessary, thereby making for less precise estimation of the parameters.

Accordingly, the researcher had carried out the Ramsey-RESET test so as toselect a correct estimated model and to check on the model specification. The hypothesis for the model specification test was formulated as follow;

H0: The model specification is correct.

H1: The model specification is incorrect.

$\alpha = 0.05$

Decision Rule: Reject H0 if P value is less than significant level. Otherwise, do not reject H0.

Table 4.6: Ramsey test of model specification

Ramsey RESET Test
Equation: UNTITLED
Specification: ROA CONC EFF MS BS BR LP AGE DUM20 DUM17 C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.549127	69	0.5847
F-statistic	0.301540	(1, 69)	0.5847
Likelihood ratio	0.348850	1	0.5548

Source:*Own computation on Eviews 8*

As it can be observed from table 4.6 above, since the p-values of t-statistics, F-statistics and likelihood ratio are 0.5847, 0.5847 and 0.5548 respectivelyare greater than significance level of 5%(0.05), it can be concluded that the model is correctly specified. Hence, do not reject the null hypothesis (H0).

4.2.7. Model Selection (Random Effect versus Fixed Effect Model)

According to Brooks C. (2014); it is often said that the random effect model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more plausible when the entities in the sample effectively constitute the entire population.The Hausman test was used by the researcher in order to select the appropriate model, which examines if any unobserved omitted variables are uncorrelated with the included explanatory variables.If they are uncorrelated, a random effects approach can be used; otherwise the fixed effects model is preferable. The null hypothesis for this test is that unobservable heterogeneity term is not correlated or random effect model is appropriate, with the independent variables. If the null hypothesis is rejected then we employ Fixed Effects method (Brooks C., 2014).

Therefore, the Hausman test hypothesis was formulated as follow:

H_0= Random effect model is appropriate

H_1= Fixed effect model is appropriate

Table 4.7:Hausman test for model selection

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	27.377154	7	0.0003

Source:*Own computation on Eviews 8*

As the result on table 4.7 above shows, Hausman test have a P-value of 0.0003 which was insignificant. As a result, the null hypothesis of the random effects was rejected. Thus, the rejection implies that, for this research fixed effect model is more appropriate than random effect model.

4.3. Results of the regression analysis

In this section result of regression analysis was presented.Under the following regression outputs the beta coefficient may be negative or positive; betaindicates that each variable's level of influence on the dependent variable. P-value indicates at what percentage or precession level of

each variable is significant. R2 values indicate the explanatory power of the model and in this study adjusted R2 value which takes into account the loss of degrees of freedom associated with adding extra variables were inferred to see the explanatory powers of the models.

Empirical model: As presented in chapter three of this study, the empirical model used in the study in order to determine the relationship between market structure and bank profitability was provided as follows:

$$P_{it} = \beta_0 + \beta_1 (CONC)_{it} + \beta_2 (MS)_{it} + \beta_3 (EFF)_{it} + \beta_4 (BS)_{it} + \beta_5 (BR)_{it} + \beta_6 (LP)_{it} + \beta_7 (AGE)_{it} + U_{it}$$

Table 4.8: Regression result

Dependent Variable: ROA
Method: Panel Least Squares
Date: 06/08/18 Time: 14:50
Sample: 2008 2017
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONC	0.000548	0.000159	-3.446775	0.0010
EFF	0.000899	4.22E-05	-21.29159	0.0000
MS	0.006698	0.001576	4.249369	0.0001
BS	0.005426	0.001361	3.986135	0.0002
BR	0.000892	0.000185	4.810830	0.0000
LP	0.000194	6.41E-05	3.024352	0.0036
AGE	-0.001171	0.003190	-0.367056	0.7148
DUM20	0.023828	0.003352	7.109043	0.0000
DUM17	0.011185	0.003274	3.416521	0.0011
C	0.006195	0.008378	0.739422	0.4624

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.925375	Mean dependent var	0.029063
Adjusted R-squared	0.906422	S.D. dependent var	0.009723
S.E. of regression	0.002974	Akaike info criterion	-8.611461
Sum squared resid	0.000557	Schwarz criterion	-8.105280
Log likelihood	361.4584	Hannan-Quinn criter.	-8.408518
F-statistic	48.82607	Durbin-Watson stat	2.013930
Prob(F-statistic)	0.000000		

Source:*Own computation on Eviews 8*

Note: significance level at 1%

From table 4.8 above, the regression result shows that Concentration, which was a market structure variable, had a positive and statistically significant relationship with profitability (p-value = 0.0010) at 1% significance level. Similarly, Efficiency had a positive and strong statistically significant relationship with profitability (p-value = 0.0000)at 1% significance level. Whereas, Age, which is one of bank specific variables, had negative and strongstatistically insignificant relationship with profitability with a p-value of 0.7148 at 10% significance level, which makes it the only variable that has negative and insignificant relationship with profitability.

The other remaining market structure variable (market share) and other three bank specific variables (bank size, bank risk and loan portfolio) similarly had a positive and statistically significance relationship with profitability at 1% significance level with a p- value of0.0001, 0.0002, 0.0000, and 0.0036 respectively.

Besides, the adjusted R-squared statistics has a value of 0.906422. The result indicates that the changes in the independent variables explain 90.64% of the changes in the dependent variable.That is concentration, efficiency, market share, bank size, bank risk, loan portfolio and Age collectively explain 90.64% of changes in ROA. The remaining 9.36% of the change in dependent variable is explained by other factors which are not included in this study model. In addition, the presence of dummy observation has significance impact on profitability.

Thus these variables collectively, are very good explanatory variables of the profitability of private commercial banks in Ethiopia. The null hypothesis of F-statistic (the overall test of significance) that the R2 is equal to zero was rejected at 1% as the p-value was sufficiently low. F value of 0.000 indicates strong statistical significance, which enhanced the reliability and validity of the model.

4.3.1. Hypothesis Testing and Summary of findings

The regression results on hand, the implications and further discussion on each of the sign and significant relationship between the dependent variable which measures the overall profitability performance of banks (ROA) and the explanatory variables was the utmost target of this study.

Therefore, the following discussions present the relationship and impact of explanatory variables on profitability.The results are interpreted based on the hypothetical relation given by the researcher. First, the market structure variables which are given to determine the profitability of commercial banks are discussed separately, and then followed by bank specific variables.

Profitability and Concentration

Table 4.9: The impact of Concentration on Profitability

Dependent Variable	Coeff	Concentration(t-statistics)
ROA	0.000548	-3.446775(0.0010)

As it can be observed from table 4.9 above, there is a positive andsignificant relationship between profitability and market structure variable (concentration) which was measured as sum of squared market shares of deposits of all the commercial banks. This shows that holding other things remain constant, a 1 percent increase in market concentration will result in 0.055 percent increased profitability, statistically significant at 1 percent significance level. The p-value of 0.0010 implies thatthe null hypothesis is rejected. The positive coefficient for degree of market concentration implies that, there is a collusive agreement among banks in the pricing policy so as to maximize their profitability performance (DemessieDea and P. Hrushikesava, 2016;Doyran, Mine A., 2012).

In other way, the result did support the structure-conduct-performance assertion of existence of collusive agreement for a positive and significant relationship between concentration and profitability performance in the commercial banking industry of Ethiopia.

Profitability and Market Share

The regression test of relationship between market share variable (MS) and overall profitability measure (ROA) is done to come up with an insight as to whether if any positive and significant relationship between market share (MS) and profitability (ROA) arises from market power.

Table 4.10: The impact of Market Share on Profitability

Dependent Variable	Coeff	Market Share(t-statistics)
ROA	0.006698	4.249369(0.0001)

As it can be seen from table 4.10 above, the regression result shows there is a significant positive relationship between market share and profitability performance at 1% significance level. The P-value of 0.0001 implies that the null hypothesis rejected at 1 percent level of significance. Holding other things remain constant, a 1 percent increase in degree of market share leads to about 0.67 percent increase in profitability, as the estimated coefficient of the degree of market share is about 0.006698. This result shows that market share has a positive impact on profitability of the Ethiopian banking industry.

The result supports the finding of DemessieDea and P. Hrushikesava(2016), which proved the positive and statistically significant values of market share,is an evidence for the existence of RMP hypothesis in Ethiopia suggesting that firms with higher market share exhibit better profitability performance than those with smaller market size.

The mere implication of significant positive relationship between market share and profitability performance of banks is that having a relatively higher market share contributes a lot to the overall performance of individual banks whether it results from cost advantage of efficient banks (ESH) or exercise of market power (RMP).

Profitability and Efficiency

The efficiency variable (EFF) measurement in this study was measured as a ratio of non-interest expense to Net income. Rather than taking market share as a proxy of efficiency, the researcher incorporate efficiency variable directly in the model as suggested in various structure-profit studies. The result of regression for efficiency variable is given below in table 4.11.

Table 4.11: The impact of Efficiency on Profitability

Dependent Variable	Coeff	Efficiency(t-statistics)
ROA	0.000899	-21.29159(0.0000)

Table 4.11 above shows, at 1% significance level, a statistically significant positive relationship between efficiency and profitability performance is observed. The estimated coefficient of the degree of efficiency, which is about 0.000899 implies that, holding other things remain constant, a 1 percent increase in efficiency will result in 0.089 percent increased profitability, statistically

significant at 1 percent significance level. Besides, the p-value of 0.0000 implies that the null hypothesis is rejected.

The result is not consistent with the study of Doyran, Mine A. (2012) which proved a negative impact of efficiency on bank profitability. Generally speaking, even if this study did not separately measures the technical and scale efficiency of banks, the result is consistent with one version of efficiency hypotheses which asserts that profitability performance is the result of efficiency of individual firms.

Bank Specific Variables and Profitability Performance of Banking Firms

The regression model in this study had incorporated market structure variables along with bank specific factors so as to assess the effect of market structure on profitability performance of banks. The inclusion of bank specific variables in the regressed model is also important since external industry structures are not the only factors which affect profitability of banks. In addition, these bank specific variables provide a clear cut on the relative impact of internal and external structural features of banks on their profitability performance.

From the regression results, the relationship between Bank size(BS), Bank risk(BR), loan portfolio holdings(LP), and Age of private commercial banks with their profitability performance measure(ROA) is discussed in the following section.

Profitability and Bank Size

Table 4.12: The impact of Bank Size on Profitability

Dependent Variable	Coeff	Bank Size(t-statistics)
ROA	0.005426	3.986135(0.0002)

As a result on table 4.12 above shows, there is a positive and statistically significant relation of bank size as measured by *ln(total assets)* and profitability is found at 1% significance level. Besides, holding other things remain constant, a 1 percent increase in bank size leads to about 0.54 percent increase in profitability, as the estimated coefficient of bank size was 0.005426. The positive relationship might tell the presence of economies of scale that large banks could be advantageous.

A large bank size could contribute to the diversification of products which may create product differentiation to increase the profitability of banks. In addition, the positive relationship between bank size (BS) and profitability performance (ROA) from the regression result is supportive of the ability of Ethiopian large private commercial banks to diversify banking products to earn a higher profit. This result was supported by the findings of Tamirat (2015), but it was against the finding of Belayneh (2011).

Profitability and Bank risk

Table 4.13: The impact of Bank risk on Profitability

Dependent Variable	Coeff	Bank risk(t-statistics)
ROA	0.000892	4.810830(0.0000)

The above table 4.13 indicates that, bank risk (BR) has shown a significant positive relationship with profitability performance measure (ROA). The estimated coefficient of bank risk 0.000892 implies that, holding other things remain constant, a 1 percent increase in bank risk leads to about 0.089 percent increase in profitability of private commercial banks of Ethiopia. Theoretically, a lower capital and reserve to total assets ratio reflects a higher risk position and a higher return. Hence, the regression result of positive and significant relationship of bank risk with profitability in this study has proven a higher risk in the form of low capital and reserve may contribute a lot to the profitability performance of private Ethiopian commercial banks.

Profitability and Loan portfolio (LP)

Table 4.14: The impact of Loan portfolio (LP)on Profitability

Dependent Variable	Coeff	Loan portfolio(t-statistics)
ROA	0.000194	3.024352(0.0036)

Table 4.14 above evidenced that Loan portfolio variable has a significant positive relationship with profitability measure of banks. And the coefficient value of 0.000194 implies that, holding other things remain constant, a 1 percent increase in loan portfolio leads to 0.019 percent

increase in profitability of private commercial banks of Ethiopia. The implication of this result is that the higher the amount of fund allocated to loan by commercial banks, the higher is their profitability performance. Hence, private commercial banks that direct the biggest portion of available funds to loan portfolio will earn a higher profitability (ROA).

In addition, the result has the implication that commercial bank funds which are invested in government securities and other investments provide low return as compared to investment in loan. The result is consistent with risk-return concepts which associate a higher return with high risk and low risk with low return.

Profitability and Age

Table 4.15: The impact of Age on Profitability

Dependent Variable	Coeff	Age (t-statistics)
ROA	-0.001171	-0.367056(0.7148)

The regression result presented in the table 4.15 above shows, there is a negative and insignificance relationship between profitability of private commercial banks and their age. As we can see, age have a significant and negative relationship with profitability of commercial banks. From the result we can say that, as long as the bank had a large market share, internally efficient and operates in concentrated market, it will earn a high profit even if the bank has small age of experience. This implies the age of commercial banks in Ethiopia has nothing to do on their profitability as long as they are efficient in operation and greater market share.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

This chapter comprises of summaries and conclusions of the research findings along with the recommendations that the researcher forwarded.

5.1. Conclusions

The Structure of a market and its effects on performance has been the area of concern for scholars and economists since the 1950's following the pioneer work of Bain. The fact that structural features of a banking market impacts the profitability performance of firms has been studied in the context of a number of countries based on the well-known paradigms of structural-conduct-performance. The SCP paradigm establishes a direct link from industry structure to firms conduct and from firms conduct to performance. The Structural-conduct-performance (SCP) view imply that concentration in the industry can generate market power, allowing banks to earn monopolistic profits by offering lower deposit rates and charging higher loan rates. Proponents of this view use the frequently observed positive relationship between market concentration and profitability to justify their arguments.

The SCP bases its clarification on the positive effect of a concentrated structure with a notion that in a more concentrated market or industry, firms are more likely to engage in ant-competitive behavior through collusive agreement in determining prices of their products and services so as to earn a higher profit. It further state that banks in a concentrated market can ignore potential competitors and stay inefficient due to technological and regulatory barriers to entry.

The other outlook on the structural-profit relation is the efficiency-structure-performance hypothesis (ESP). The ESH interprets the positive relationship between profitability and market concentration in a different way that the positive relationship is not a consequence of market power but of the greater efficiency of firms with larger market share. In other words, the superior

performance of the market leaders endogenously determines the market structure, implying that higher efficiency produces both higher concentration and greater profitability.

The study was primarily designed to assess the effect of market structure on the profitability performance of banks. Market structure is not the only factor to determine the profitability of banks. The extent of profitability of banks that can be explained by bank specific factors is also implicitly paramount important in the study. Likewise, the study tried to include the main features of industry structure and firm specific structure which are believed to alter the profitability performance of banks.

Specifically, the researcher was interested to answer how the profitability performance of banks is affected by the level of concentration in the industry during the given study period. Assessing such relationship also helps to identify the existence or absence of dominant banks collusive agreement in their pricing policy. In order to find out the relative importance of efficiency of banks in determining their profitability, the researcher has gone through investigating the effect of efficiency on profitability. Following the hypothetical relationship given in the efficiency structure hypotheses (ESH), the study has tried to prove whether individual banking firms' efficiency is important in determining the market structure of Ethiopian commercial banks.

The measures of market structure features in this study were commonly used in all structure-profit relationship studies. The two structural measures in the study were concentration and market share variables. The variable concentration is believed to capture the degree of collusive agreement among banks in their pricing policies. The market share variable was a measure of market structure which is included to assess the degree of market power enjoyed by individual banks and the resulting effects on their profitability performance. The bank specific features were measured and represented by variables Bank size, Bank risk, loan portfolio, age and efficiency variables.

The study was conducted from data collected in secondary sources. Based on the criterion stated to select sample banks, eightprivate commercial banks were included in the sample. Ten years data of selected commercial banks financial statements were collected from national bank of Ethiopia and the study period extends from year 2008/9-2016/17 G.C.

In accordance with the stipulated purposes of the study, a regression model was applied to analyze the data collected and to obtain empirical results. In order to assess the impact of market structure on profitability of banks, market structure variables(concentration, market share), and bank specific measures like efficiency(EFF), bank size(BS), bank risk (BR), loan portfolio of banks(LP) and Age are regressed on profitability measure variable(ROA).

The result of analysis from the regression model test shows that there is a positive relationship between concentration and profitability of banks. This relationship result is an evidence for the presence of collusion in the commercial banking industry of Ethiopia during the sample study period (2008/9-2016/17). The other market structure variable, market share (MS) has also a significant positive relationship with profitability measure of commercial banks.

From the regression results related to profitability and bank specific measures, bank size (BS) was found significant to affect profitability of banks and indicate theefficient economies of scale of large size banks. The measure of banks risk (BR) variable has also shown significant positive relationship with profitability. The relationship suggests that those commercial banking firms which run with low capital and reserve have rewarded a higher profitability. Similarly, loan portfolio (LP) which is the ratio of loan to total assets is found positively and significantly related with profitability performance of banks. The resulting loan portfolio (LP) and profitability relationship tells that higher amount of funds invested in loan contribute a lot to the profitability performance of banks. But, in contrary to these results a negative relationship was observed between bank profitability and age of banking firms. This implies to earn a higher return, age of banks does not matter if they are efficient in operation and obtains higher market share.

The overall regression result in this study did fully magnify the importance of market structure of Ethiopian commercial banks to the profitability performance of banking firms. Because, the effect of market structure can't be ignored since a relatively higher market share and concentrated marketare found contributing a lot to the profitability of banks. The researcher could come up with the answer as to the cause for higher profitability performance through higher market share and market concentration.

5.2. Recommendations

Identifying the relationship of profitability performance of commercial banks with regard to the market structure and firm specific features have its own implication to all round constituents of the banking system. It is obvious that the structure of the financial sector is influenced by regulatory policies adopted in a given financial system. In order to enhance a strong and heath financial system, the competitive edge needs to be carefully decided. Literatures and empirical reviews on the financial sector suggest that excessive competition in the financial sector, specifically in the banking system may leads to financial instability. On the other hand, non-competitiveness may create inefficiency. It may also adversely affect the welfare of customers in the form of high intermediation costs.

Based on the findings of the research the following recommendations are provided:

- The structure of a market could tell the extent of competitiveness and efficiency of banks in the sector. A concentrated market is characterized by a competitive behavior and is believed to activateefficiency. On the other hand, absence of a certain degree of market power especially in the financial sector is believed to results in instability in the sector. Considering the above outlooks, such type of study and the resulting implications are needed primarily for policy makers and supervisory bodies of the banking sector.

- From the perspectives of both banks profitability performance and provision of adequate customers' welfare services, the extent of market power which commercial banks should enjoy has to be determined carefully. Therefore, managements of commercial banks needs to closely follow the ever dynamic changes of their environment and should take measures in the working of their operation to cope up with the facts at hands. In addition, potential investors need to have detail of the structure of a given industry and how it could affect their investment returns.

- The results of the regression analysis in this study may provide an insight as to what aspects of the industry as well as firms should be considered in adopting regulatory policies and operating decisions. As evidenced in the regression analysis and discussion part of this study, operating in more concentrated market, having larger market share, and being

internally efficient are the main factors which create differences in profitability performances of commercial banks in Ethiopia. Therefore, banks have to pay greater attention on expanding their market share and improving their efficiency so as to improve their profitability performance.

- Considering the resulting discussion, large size commercial banks should take the advantage of economies of scale through optimal utilization of sizes. Having a bigger bank size alone may not assure a higher profitability unless the scale advantage is properly utilized. Having a lower capital and reserve to total assets may accelerate the short run profitability performance of banks but the amount of capital and reserve that banks should hold has to be determined considering both short run profitability performance and the long run growth prospects. The type of investment that banks engage was found to affect their profitability performance. Thus, careful analysis of allocation of available funds is required so as to attain maximum profit with minimal risk.

- Finally, the study sought to investigate the impact of market structure on profitability of private commercial banks Ethiopia. For comprehensive investigation future researcher could increase the number of observations by increasing the sample size and extending the period of time with unbalanced data. In addition, future researches could cover cross countries to capture countries differences and to uncover difference from financial system and regulation factors.

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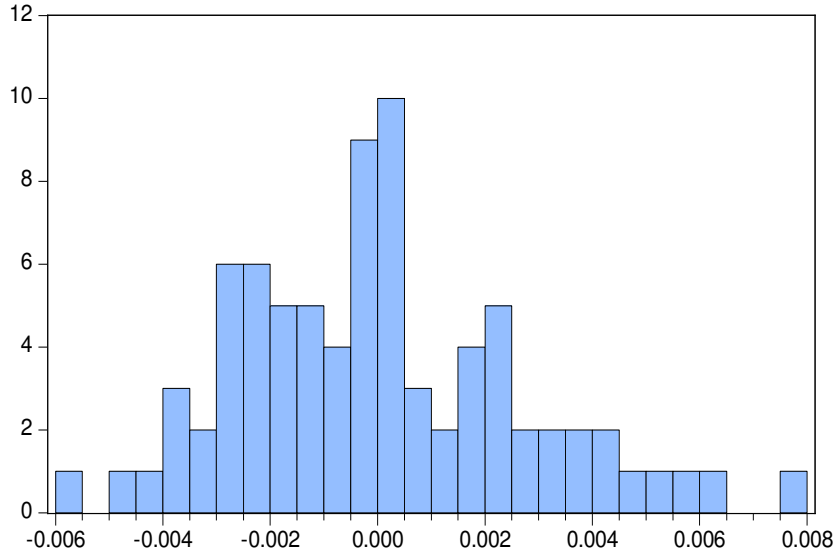
APPENDIXES

Appendix A: Tests for the CLRM assumptions/Diagnostic test

1. Test of Normality



Series: Standardized Residuals
Sample 2008 2017
Observations 80

Mean	1.90e-19
Median	-0.000264
Maximum	0.007562
Minimum	-0.005763
Std. Dev.	0.002656
Skewness	0.515522
Kurtosis	3.125179
Jarque-Bera	3.595734
Probability	0.165652

2. Test for Multicollinearity; Using Correlation Matrix

	CONC	EFF	MS	BS	BR	LP	AGE
CONC	1.000000						
EFF	-0.421601	1.000000					
MS	0.962565	-0.485175	1.000000				
BS	0.370538	-0.291943	0.489718	1.000000			
BR	-0.422529	0.249179	-0.473826	-0.493377	1.000000		
LP	0.005101	0.272143	0.059085	0.240804	-0.188362	1.000000	
AGE	0.538622	-0.538275	0.693077	0.551059	-0.224991	0.093251	1.000000

3. Test for Heteroskedasticity; white test

Heteroskedasticity Test: White

F-statistic	0.601532	Prob. F(9,70)	0.7915
Obs*R-squared	5.743023	Prob. Chi-Square(9)	0.7653
Scaled explained SS	6.499456	Prob. Chi-Square(9)	0.6891

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/08/18 Time: 14:55
Sample: 1 80
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.37E-05	2.26E-05	1.486772	0.1416
CONC^2	5.23E-09	9.99E-09	0.523596	0.6022
EFF^2	-1.77E-09	3.16E-09	-0.558076	0.5786
MS^2	-4.28E-07	6.68E-07	-0.640349	0.5240
BS^2	-8.52E-07	1.23E-06	-0.690700	0.4920
BR^2	2.16E-08	2.97E-08	0.729325	0.4682
LP^2	-3.44E-09	5.45E-09	-0.631911	0.5295
AGE^2	4.18E-06	1.09E-05	0.384071	0.7021
DUM20^2	-7.56E-07	2.59E-05	-0.029189	0.9768
DUM17^2	-1.57E-05	2.40E-05	-0.654210	0.5151

R-squared	0.071788	Mean dependent var	1.33E-05
Adjusted R-squared	-0.047554	S.D. dependent var	2.31E-05
S.E. of regression	2.36E-05	Akaike info criterion	-18.35293
Sum squared resid	3.90E-08	Schwarz criterion	-18.05518
Log likelihood	744.1173	Hannan-Quinn criter.	-18.23356
F-statistic	0.601532	Durbin-Watson stat	1.971700
Prob(F-statistic)	0.791518		

4. Test for Autocorrelation;

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.222025	Prob. F(2,68)	0.3010
Obs*R-squared	2.775593	Prob. Chi-Square(2)	0.2496

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 06/08/18 Time: 14:56
Sample: 1 80
Included observations: 80
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONC	7.07E-05	0.000167	0.423729	0.6731
EFF	1.15E-05	5.13E-05	0.223391	0.8239
MS	-0.000723	0.001647	-0.439098	0.6620
BS	-0.000575	0.001614	-0.356551	0.7225
BR	-6.74E-05	0.000166	-0.407090	0.6852
LP	-5.95E-07	8.10E-05	-0.007340	0.9942
AGE	0.001386	0.002352	0.589342	0.5576
DUM20	-0.000302	0.004321	-0.069829	0.9445
DUM17	0.001258	0.004049	0.310636	0.7570
C	0.003188	0.007837	0.406753	0.6855
RESID(-1)	0.170800	0.135043	1.264779	0.2103
RESID(-2)	0.107073	0.127238	0.841516	0.4030

R-squared	0.034695	Mean dependent var	-9.17E-18
Adjusted R-squared	-0.121457	S.D. dependent var	0.003675
S.E. of regression	0.003891	Akaike info criterion	-8.122563
Sum squared resid	0.001030	Schwarz criterion	-7.765259
Log likelihood	336.9025	Hannan-Quinn criter.	-7.979310
F-statistic	0.222186	Durbin-Watson stat	1.965620
Prob(F-statistic)	0.995381		

5. Ramsey test of model specification

Ramsey RESET Test
Equation: UNTITLED
Specification: ROA CONC EFF MS BS BR LP AGE DUM20 DUM17 C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.549127	69	0.5847
F-statistic	0.301540	(1, 69)	0.5847
Likelihood ratio	0.348850	1	0.5548

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	4.64E-06	1	4.64E-06
Restricted SSR	0.001067	70	1.52E-05
Unrestricted SSR	0.001062	69	1.54E-05
Unrestricted SSR	0.001062	69	1.54E-05

LR test summary:

	Value	df
Restricted LogL	335.4901	70
Unrestricted LogL	335.6645	69

Unrestricted Test Equation:
Dependent Variable: ROA
Method: Least Squares
Date: 06/08/18 Time: 15:23
Sample: 1 80
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONC	-0.000365	0.000199	-1.838864	0.0702
EFF	-0.000793	0.000184	-4.316106	0.0001
MS	0.003839	0.002094	1.833588	0.0710
BS	0.004958	0.001728	2.868948	0.0055
BR	0.000903	0.000318	2.841884	0.0059
LP	9.75E-05	8.91E-05	1.094151	0.2777
AGE	-0.012258	0.004147	-2.956226	0.0043
DUM20	0.019739	0.005912	3.338964	0.0014
DUM17	0.006004	0.004965	1.209317	0.2307
C	0.021870	0.007957	2.748705	0.0076
FITTED^2	2.438204	4.440149	0.549127	0.5847

R-squared	0.857787	Mean dependent var	0.029063
Adjusted R-squared	0.837176	S.D. dependent var	0.009723
S.E. of regression	0.003923	Akaike info criterion	-8.116613
Sum squared resid	0.001062	Schwarz criterion	-7.789084
Log likelihood	335.6645	Hannan-Quinn criter.	-7.985297
F-statistic	41.61866	Durbin-Watson stat	1.704339
Prob(F-statistic)	0.000000		

6. Hausman test for model selection

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	27.377154	7	0.0003

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CONC	-0.000535	-0.000427	0.000000	0.4325
EFF	-0.000848	-0.000810	0.000000	0.1080
MS	0.006478	0.004427	0.000002	0.1370
BS	0.007243	0.006123	0.000001	0.1743
BR	0.001003	0.000985	0.000000	0.9217
LP	0.000194	0.000112	0.000000	0.0003
AGE	-0.000326	-0.012572	0.000014	0.0010

Cross-section random effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 06/08/18 Time: 15:20
Sample: 2008 2017
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004016	0.011317	-0.354856	0.7238
CONC	-0.000535	0.000217	-2.462843	0.0164
EFF	-0.000848	5.48E-05	-15.46566	0.0000
MS	0.006478	0.002151	3.011478	0.0037
BS	0.007243	0.001831	3.954981	0.0002
BR	0.001003	0.000250	4.007193	0.0002
LP	0.000194	8.77E-05	2.210825	0.0306
AGE	-0.000326	0.004356	-0.074903	0.9405

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.855849	Mean dependent var	0.029063
Adjusted R-squared	0.824801	S.D. dependent var	0.009723
S.E. of regression	0.004070	Akaike info criterion	-8.003077
Sum squared resid	0.001077	Schwarz criterion	-7.556447
Log likelihood	335.1231	Hannan-Quinn criter.	-7.824011
F-statistic	27.56536	Durbin-Watson stat	1.928388
Prob(F-statistic)	0.000000		

Appendix B:

1. Result of fixed effect regression model

Dependent Variable: ROA
Method: Panel Least Squares
Date: 06/08/18 Time: 14:50
Sample: 2008 2017
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONC	0.000548	0.000159	-3.446775	0.0010
EFF	0.000899	4.22E-05	-21.29159	0.0000
MS	0.006698	0.001576	4.249369	0.0001
BS	0.005426	0.001361	3.986135	0.0002
BR	0.000892	0.000185	4.810830	0.0000
LP	0.000194	6.41E-05	3.024352	0.0036
AGE	-0.001171	0.003190	-0.367056	0.7148
DUM20	0.023828	0.003352	7.109043	0.0000
DUM17	0.011185	0.003274	3.416521	0.0011
C	0.006195	0.008378	0.739422	0.4624

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.925375	Mean dependent var	0.029063
Adjusted R-squared	0.906422	S.D. dependent var	0.009723
S.E. of regression	0.002974	Akaike info criterion	-8.611461
Sum squared resid	0.000557	Schwarz criterion	-8.105280
Log likelihood	361.4584	Hannan-Quinn criter.	-8.408518
F-statistic	48.82607	Durbin-Watson stat	2.013930
Prob(F-statistic)	0.000000		

2. Summary of descriptive statistics analysis

	ROA	CONC	EFF	MS	BS	BR	LP	AGE
Mean	0.029063	16.0635	38.2075	3.593388	3.908125	13.82313	45.71888	0.7625
Median	0.029	10.53005	34.75	3.245	3.95	12.905	45	1
Maximum	0.049	74.1321	82.7	8.61	4.62	29.79	60.1	1
Minimum	-0.002	0.3721	23	0.61	2.76	7.9	31.35	0
Std. Dev.	0.009723	14.47471	12.30946	1.786324	0.386981	3.664238	6.187095	0.428236
Skewness	-1.043668	1.452386	1.682852	0.345306	-0.857873	1.250005	-0.036137	-1.233694
Kurtosis	4.6657	5.614634	5.696246	2.650107	3.731988	5.885257	2.811066	2.522002
Jarque-Bera	23.77176	50.91339	61.99236	1.997905	11.59864	48.58252	0.136398	21.05496
Probability	0.000007	0	0	0.368265	0.00303	0	0.934075	0.000027
Sum	2.325	1285.08	3056.6	287.471	312.65	1105.85	3657.51	61
Sum Sq. Dev.	0.007469	16551.86	11970.3	252.0852	11.83062	1060.705	3024.131	14.4875
Observations	80	80	80	80	80	80	80	80

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