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Structure Conduct and Performance Analaysis in Ethiopian Banking Industry

GETACHEW MELAKU
ABEBE FENTAW NEBEBE
KALID YIMER

Abstract
The General objective of the study was to analyze the Structure, Conduct and Performance of Banking Sector in Ethiopia by using balanced panel data for 10 years (2009-2018) annual audited financial statements of 12 banks and macroeconomic data. The Random effect model was used for the Return on Asset (ROA) model, and fixed effect for Return on Equity (ROE) based on the Hausman model specification test.Market concentration measure reveled that there was more concentration ratio in terms of asset, deposit and loan and advance in Ethiopia banking sector..The study result revealed that bank specific factors such as Bank size, Capital adequacy, Loan to Deposit Ratio, Income Diversification and growth deposit are statistically positively significant in determining profitability of banks. The cost income ratio is negatively affect bank profitability. From industry specific factor positive significant associations between Concentration (HHI) and Banking sector Development with profitability. The positive sign of concentration characterized the nature of Ethiopian banking sector may need for more competition and more entry into the banking market and confirm the structure–conduct–performance hypothesis which stipulates that higher market power submit monopoly profits. In general, the overall empirical findings provide evidence that the profitability of banks are mainly dominated by bank-specific factors which are on the hands of the management of the banks. So, the study suggests to the banks' managers and policy makers to give high concern on the internal factors of profitability and set direction to manage the most dominant factors of performance.
Keywords: Structure, Conduct, Bank Performance, Market Concentration, Profitability
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1. Introduction

The Structure-Conduct-performance(S-C-P) relationships propounded initially by Mason (1939) and modified subsequently by Bain (1959). The traditional SCP framework suggests that the possibility of collusive behavior increases when the market is concentrated in the hands of new firms, and the higher the market concentration, the larger will be the profitability of the firms. In other words, there is the positive correlation between market concentration and performance of firms. Many studies have attempted to test validity of the basic proposition of a traditional SCP paradigm that the market concentration lowers the cost of collusion between firms, and results in higher than normal profits (Deepti and Pulak, 2012).

The last two decades the Ethiopian financial industry has gone through various changes which includes of the improvement in management information system through information communication technology and the influence of globalization on the structure, size and scope of the Ethiopian banking sector has been very high. After the 1994 financial sector reform, the Ethiopian banking sector has entertained the introduction of private banks in the sector which was dominated by government banks. The emergence of private banks has increased the completion in the banking industry, the level and types of financial services and the market structure of the banking industry, which intern impacted the scale banks operational efficiency and competitiveness (Demissie, 2016).

Banks in Ethiopia, particularly private banks, turn out to be profitable every year, have made good returns to their shareholders or investors. This has helped them to get more funds from the public and enhance their capital buffers, and remain solvent but there are variations in private banks financial performances. Therefore, banks' profitability will generally vary directly with the riskiness of their portfolios and operations, they need always to carefully identify, assess, monitor and control risks associated with credit, liquidity, market, operations, reputation, legal and the overall economic environment (Fortune News, 2015). According to NBE (2017/2018), Currently the Ethiopian bank industry comprises of total Eighteen (18) banks, sixteen (16) private commercial banks and Two(2) government owned banks (one development bank and one public commercial bank).

2. Statement of the problem

The structural features and the overall conduct and nature of competition 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 in Ethiopian Private Commercial Banks (Tesfaye,2013;Abdulwali,2018; Yalemselam, 2018). However, as per the access and knowledge of the researcher, there were only a few studies on the research title (i.e. Tesfaye, 2018) conducted showing the relationship between market structure and performance of Ethiopian Commercial Banks and his research methodology was Based on qualitative approach ,interviews and Eshetu (2009), studied time period of 2000-2009 in Ethiopia.

According to the traditional industrial organization theory, there are two competing approaches: the Structur , Conduct Performance (SCP) hypothesis and the Efficient Structure hypothesis (ESH). These competing hypotheses are used to investigate the relationship between the concentration and competition in the banking sector. The SCP states that the higher the concentration in a market, the lower the competition and the higher profits that the firms receive, whereas ESH takes the efficiency factor into account and states that the firms with superior efficiency improve their market shares and become more profitable (Abbasoglu et al, 2007). This study tests the competing hypotheses to identify the structure of the banking industry and the nature of profitability.

In case of Ethiopia, studies conducted by Tesfaye (2013); Sori (2014); Abdulwali (2018); Yalemselam (2018), studied on Determinant of Commercial Banks' Profitability and/or Factor Affecting Banks Profitability and all are concerned on only private commercial banks in Ethiopia, they do not include the government owned commercial bank in their studies. According to World Bank report (2017) total bank assets constitute 25% of the total GDP in Ethiopia, which clearly indicates how significant the sector is to the overall economy. Ethiopia is the country where one hundred thousand individual share 0.02 banks and where 84% of the banking sector is dominated by five banks of which the government owned banks take 61% and the remaining 23 % covered by private banks. Having this information the researcher included government owned bank in his sampling unit. Inclusions of such banks in the study part are more representative of the Ethiopian banking sector, since government owned banks dominated Ethiopian banking sector.

3. Objective of the Study

The general objective of the study was to examine the relationship between market structure, conduct and performance of Ethiopian banking sectors.

4. Literature and Empirical Review

4.1. The Concepts and Definitions

The Structure-Conduct-Performance model (SCP) defined as the relationship between markets Structure, firm conduct and firm performance postulates that the existence of entry barriers is the major determinant of firm profits, thus the greater cost of entry makes it easier for existing firms to maintain monopoly profits. Considered differently, new entrants will diminish the level of those profits. Therefore, market concentration decreases the cost of collusion between firms and results in abnormal profits for existing firms in the market. The SCP has been one of the most tested hypotheses in the industrial organizations (Sinkey, 1986).

Market Structure: "Market" or "Industry" structure may mean the characteristics or features of a certain industry or sector, e.g. the volume and the distribution of capital, production, employment among the units in the industry or sector. Most of the studies on the banking structure emphasize the concentration level and barriers to entry as the main components of the banking structure. They, however, add to them branching as an important element particular to the banking sector and a significant determinant of its structure (Ahmed, 1992).

Market Conduct: Bain (1950) identified market conduct as "patterns of behaviour that enterprises follow in adapting or adjusting to the market in which they sell". Conduct refers to the behaviour of firms under a given set of circumstances and is normally determined by the structural characteristics of the industry. Market conduct deals essentially with the behaviour of middlemen and conduct of marketing functions with regard to the formation of association, pricing policies, price collusion and discrimination, sex restrictions and monopoly practices.

Market Performance : Market performance refers to the composite of end results which industry in any market arrives at by pursuing whatever lines of conduct they espouse, end result in the dimensions of price, output production and selling cost, product design and so on (Bain, 1968). Alternatively, market performance can be considered as an appraisal of how much the economic results of an industry's market behaviour deviate from the best possible contribution it could make to achieve some specified goals of the economy. Baldrige (2010) states that performance refers to output results and their outcomes obtained from processes, products, and services that permit evaluation and comparison relative to goals, standards, past results, and other organizations

4.2. Bank Performance Indicators

On the issue of investigating the factors that influence the performance of the bank are most commonly employed one or two or all of the three alternative measures (ROA, ROE and NIM) were used. Each ratio looks at a slightly different aspect of bank profitability, Athanasoglou et al, (2006).

Return on Asset (ROA): ROA is one of the major ratios that indicate the profitability of a bank and it has emerged as the key ratio for the evaluation of bank profitability. It is defined as the ratio of net profits to total assets. It measures the ability of a bank's management to generate income by utilizing the company assets, although it may be misleading due to off-balance-sheet activities, Athanasoglou (2006).

Return on Equity (ROE): ROE is the second measure of bank profitability and is defined as the net profit before interest and tax divided by total equity (Michael, 2015). It reflects how much profit a bank earned compared to the total amount of shareholder equity invested or found on the balance sheet and it measures how effectively a bank management is using shareholders' funds. It is defined as the ratio of net profits to total equity. A business that has a high return on equity is more likely to be one that is capable of generating cash internally. Thus, the higher the ROE the more effective the management in utilizing the shareholders capital and the better the company is in terms of profit generation, Tesfaye(2018).

4.3. Empirical Literature

The study conducted by Ahmed(2012) examines the degree of concentration and performance of the Bangladesh banking industry for the period 1999-2011 by using the random effects (RE) estimator. It applies two competing hypotheses of the traditional industrial organization theory, e.g. the structure conduct performance (SCP) paradigm and efficient structure hypothesis (ESH) to investigate the relationship between the concentration and competition in the banking sector. The results of the main sample (1999-2011) do not find any support for either of the hypotheses. However, a sub-sample (2002-2011) of the study supports the SCP hypothesis that the profitability of the Bangladesh banking market is determined by concentration and not by the market share of banks.

Sanl and Heng (2013), conducted the study aims to investigate the impact of bank-specific factors which include the liquidity, credit, capital, operating expenses and the size of commercial banks on their performance, which is measured by return on average assets (ROA) and return on average equity (ROE). The results imply that ratios employed in this study have different effects on the performance of banks in both China and Malaysia, except credit and capital ratios. Operating ratios influence performance of banks in China, but this influence is not true for Malaysian banks regardless of the measure of performance.

The study of Alper and Anbar (2011) focuses on the bank specific and macroeconomic determinants of Profitability in Commercial Bank of Turkey under the period 2002 to 2010. It uses ROA and ROE as dependent variables to examine the determinant of banks' profitability. The finding the research reveals that asset size and non-interest income have a positive and significant effect on bank profitability.

The study was carried out by Tesfaye (2013) to empirically explore the bank specific, industry specific and macroeconomic determinants of Ethiopian commercial banks' performance using unbalanced 10 years (2003-2012) annual audited financial statements of 16 banks and macroeconomic data. The empirical result revealed that all bank specific factors except Loan to Deposit Ratio are statistically significant in determining profitability of Ethiopian commercial banks. Among them Cost Income Ratio and Liquidity negatively affect bank performance. There are also significant associations between Concentration and Size Bank System with profitability. However, no evidence is found about the relation between macroeconomic factors and performance of banks.

Sori (2014), is examined Factor affecting bank profitability on Ethiopian private commercial Banks. The study adopted a quantitative research approach and the statistical cost accounting model was used to estimate the profitability, which was measured by return on asset as a function of balance sheet, industry specific and macroeconomic explanatory variables. The finding of the study show that loan and advance, current deposit, other liabilities and gross domestic product have statistically significant and positive relationship with banks' profitability. On the other hand, variables like fixed deposit, market concentration have a negative and statistically significant relationship with banks' profitability.

Demessie and Hrushikesava (2016) 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 as oligopolistic behavior, concluding that there is statistically insignificant correlation between concentration and performance which did not provide sufficient evidence to reject the SCP hypothesis.

The paper investigated by Abdulwali (2018) on the impact of market structure on the profit performance of Ethiopian private commercial banking firms. A panel data of selected eight private 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 results confirm the significance of concentration and market share to profitability performance of banks. Efficiency, bank size, bank risk, and loan portfolio were among the factors to alter the profitability

performance of banks, whereas Age is found to be the only variable which has a negative and insignificant impact on bank profitability.

Yalemselam (2018) has investigated factors affecting the profitability of private commercial banks in Ethiopia, covering a ten years period from 2008 to 2017, using unbalanced panel data from fourteen Ethiopian private commercial banks. The fixed effect regression output revealed that from bank specific variables; capital adequacy and bank size have significant positive effect on profitability. Besides, operation efficiency has a negative significant effect on profitability, but liquidity risk and credit risk were found not powerful variables in the determination of banks profitability. From macroeconomic variables; foreign exchange rate and lending interest rate were found to have significant (though at 10% level of significance) negative effect on Ethiopian private commercial banks profitability. Conversely, real GDP growth rate and inflation rate were found statistically insignificant. Having this information the researchers, however, included government owned bank in his sampling unit. Inclusions of such banks in the study part are more representative of Ethiopian banking sector, since government owned banks dominated Ethiopian banking sector.

5. Data, Methods and Model Specification

5.1. Data Source

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) of each banks, NBE annual reports, ministry of Finance and Economic Development.Therefore, the study has a time series segment spanning from the period 2009 up to 2018 and a cross section segment which considered Twelve Ethiopian commercial Banks with balanced panel data of 120 observations. According to the National bank of Ethiopia (2017/2018), there are 18 licensed banks in the country (2 Governmental owned and 16 Private Banks). Thus, the total sample size is Twelve (12) banks, one (1) from governmental and eleven (11) from Private owned banks.

5.2. Methods of Data Analysis

5.2.1. Panel Data

The term panel data refers to the pooling of observations of separate units (countries, banks, groups of people etc.) on the same set of variables over several time periods. In this research balanced panel used because each cross-sectional unit of the study does have the same number of time series observations due to the same in their date of establishment to absorb 10 years of data(2009-2018).

Fixed effects, and random effects model were used after testing the validity of the assumption of the models by using the Hausman test for each two models (Brooks, 2008) by incorporating banks specific, industry specific and macroeconomic variables for time period of 10 years (2009 to 2018) on The FE model assumes that the marginal effects of the explanatory variables on the dependent unit are the same for all units (i.e. firms). The constant term is allowed to vary among the units to account for the differences between units. It has also been shown that the FE estimator is consistent even when the RE model is valid or even if the time-invariant component of the error term is correlated with the regressors (Johnston and Dinardo, 1997; Nguyen, J., 2006).

5.2.2. Market Concentration Index

This study calculates both k-bank concentration ratio (CRk) and the Herfindahl Hirschman Index (HHI) to show the extent of market control of the largest firms in the Ethiopian banking industry and to illustrate the degree to which the industry is oligopolistic.

Both simplicity and limited data requirements make the k bank concentration ratio one of the most frequently used measures of concentration in the empirical literature. Summing only over the market shares of the k largest banks in the market, it takes the form:

$$CR_k = \sum_{i=1}^{k} S_i \qquad (1)$$

Where, Si is the market share of i-th bank when banks are ranked in descending order of the market share. In this study, the market share is measured on the basis of the deposit size of the banks. The value of k is 3 and 5 i.e. CR3 and CR5.

The index approaches zero for an infinite number of equally sized banks (given that the k chosen for the calculation of the concentration ratio is comparatively small when compared to the total number of banks) and it equals unity if the banks included in the calculation of the concentration ratio make up the entire industry (Bikker and Haaf 2000, AlMuharrami etal, 2006).

The Herfindahl-Hirschman Index (HHI)

The Herfindahl-Hirschman Index (HHI) is the most widely treated summary measure of concentration, which often serves as a benchmark for the evaluation of other concentration. The HHI can range from zero in a market having an infinite number of firms to 10,000 in a market having just one firm (with a 100% market share). The

HHI is a static measure and, therefore, gauges market concentration at a single point in time (Bikker and Haaf 2000, Al-Muharrami *etal.* 2006).

$$HHI = \sum_{i=1}^{n} S_i^2 \qquad (2)$$

Where n is the total number of banks in the industry. In the calculation of HHI, the larger banks get a heavier weighting than their smaller counterparts, which reflects their relative importance in the market.

5.3. Econometric Methodology

5.3.1. Model Specification

There is a need to estimate a relationship of the following form using the panel data consisting of twelve banks' data across a period from 2009 to 2018. The model question is

$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{i\,t}$…… (1)

Where, α represents the intercept, β_1, β_2 … β_n represent the respective regression coefficients for explanatory variables X_1, X_2 …X_n for estimating

Y_{it}, the equation, then, can be written as;

$Y_{it} = \alpha_i + \beta_1 BS_{it} + \beta_1 IndS_{it} + \beta_2 Macro_{it} + \varepsilon_{it}$…… (2)

Where, Y_{it} is an index of Performance(Profitability) represented by ROA and ROE, BS is vector of bank specific variables, IndS is vector of industry specific variables and Macro is vector of macroeconomic variables that are believed to determine the level of performance(profitability). While α_i is unobserved macro, industry and bank specific time; invariant effect which allows for heterogeneity in the means of the Y_{it} series across banks and ε is the error term.

Then, the equation would be;

ROA Model: - Return on Assets as dependent variable

$ROA_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 CA_{it} - \beta_3 LIQ_{it} + \beta_4 LD_{it} - \beta_5 CIR_{it} + \beta_6 DIV_{it} + \beta_7 GD_{it} + \beta_8 BRA_{it} + \beta_9 MC_{it} + \beta_{10} MS_{it} + \beta_{11} BSD_{it} + \beta_{12} OWN_{it} + \beta_{13} GDP_{it} - \beta_{14} INF_{it} + \varepsilon it$ ..... (3)

ROE Model: - Return on Equity as dependent variable

$ROE_{i,t} = \alpha + \beta_1 SIZE_{it} + \beta_2 CA_{it} - \beta_3 LIQ_{it} + \beta_4 LD_{it} - \beta_5 CIR_{it} + \beta_6 DIV_{it} + \beta_7 GD_{it} + \beta_8 BRA_{it} + \beta_9 MC_{it} + \beta_{10} MS_{it} + \beta_{11} BSD_{it} + \beta_{12} OWN_{it} + \beta_{13} GDP_{it} - \beta_{14} INF_{it} + \varepsilon_{it}$ .. …….. (4)

Where

α=coefficient of intercept (constant)

β_1- β_{14} =coefficients of explanatory variables

ε_i = the error term

5.3.2. Definition of Variables

In the study, Two Dependent and Fourteen Explanatory Variables are included in the Econometric regression model and defined as follows:-

Table 1 : Description of dependent, Independents Variables and Working Hypothesis

	Variable Name	Code	Descriptions	Var. Measurement	Exp. sign
DEP'T	Return on Assets	**ROA**	Net profit / Total Asset		
	Return on Equity	**ROE**	Net profit / Total Equity		
	Bank Specific Factors:				
EXPLANATORY	Bank Size	***SIZE***	Natural Log of Total Asset	Continuous	+/-
	Capital Adequacy	***CA***	Total Equity / Total Asset	Continuous	+
	Liquidity Risk	***LIQ***	Liquid Asset / Total Asset	Continuous	-
	Loan-to-Deposit ratio	**LD**	Total Loan / Total Deposit	Continuous	+
	Cost-Income Ratio	***CIR***	Total Operating Expense/ total generated revenues	Continuous	-
	Income Diversification	***DIV***	Non-interest Income / Average Assets	Continuous	+
	Growth Deposit	***GD***	Deposits of i bank in t Year minus i bank deposits in t-1 divided by i bank deposit in t-1 year	Continuous	+/-
	Branch Expansion	***BRA***	Number of branch opened	Continuous	+
	Ownership	***OWN***	Dummy variable(1 =private owned and otherwise 0=government owned bank)	Discrete	+
	Industry Specific Factors				
	Concentration ratio on Bank asset	**MC**	Calculated by HHI	Continuous	+
	Market Share of Deposit	**MS**	The ratio of total bank deposit of each in relation to the sum total of all deposit banks in the sample.		+
	Banking Sector Dev't	**BSD**	Total Assets of All Banks / GDP	Continuous	+/-
	Macroeconomic Factors				
	Real GDP Growth rate	**GDP**	GDP of Countries in (%)	Continuous	+
	Inflation Rate	**INF**	Annual Inflation Rate(%)	Continuous	-

6. Results and Discussion

6.1. Descriptive Statistics

The research introduces summary statistics for all variables in Table 2 including mean and standard deviation with minimum and maximum value were reported. This was generated to give overall description about data used in the model

Table 2 : Descriptive Statistics for Variables in the model

Variable		Obs.	Mean	Std.dev.	Min.	Max.
Dependent Variable	**ROA**	120	3.586524	1.267814	.01	7.235772
	ROE	120	27.89392	25.49808	2.2	132.6
Bank Specific	SIZE	120	4.04225	.5946151	2.55	5.75
	CA	120	13.52254	15.96458	0.1	73
	LIQ	120	15.63625	15.75543	3.54	97.91
	LD	120	52.42358	22.34148	.42	103.45
	CIR	120	38.57833	19.06028	3.42	150.8
	DIV	120	9.340833	15.45408	.09	74.2
	GD	120	32.86467	26.45	.8	147.48
	BRA	120	167.4	224.0467	4	1280
Industry Specific	HHI(asset)	120	.395	.039215	.32	.44
	Mkt Share	120	7.557959	12.89799	0.1770	62.06522
	BSD	120	29.556	3.083226	25.14	35.83
Macro Economic	RGDP	120	9.917	1.002988	8	11.4
	INF	120	12.3	8.310447	2.8	34.1

Source: Computed by using Stata14

As shown in the Table 2, the means for ROA and ROE are 3.5865 and 27.8939 percent, and the standard deviations are 1.2678 and 25.498 percent, with a minimum of 0.01, 2.2 percent, and a maximum of 7.235772 and

132.6 percent respectively. The mean value (3.586524) of return on asset determines that on average commercial banks has been earning 3.6 % on their total assets and earn on an average positive profit over the last decade. However, the difference between minimum(0.01) and maximum(7.2357) clearly shows that there are large differences in profitability(ROA) among the sample banks. That means, the most profitable commercial bank in Ethiopia earned 7.235 cents of net income from a single birr of asset investment and 132.6 cents per birr from the banks equity. The standard deviation of 1.27 and 25.5 shows there is significant variation in ROA among commercial banks and almost unstable and not constant on ROAand ROE during the sample periods respectively.

There are 14 independent variables used in this study. A natural log of total asset of the bank is used to represent the size of the bank during the study period ranges from minimum of 2.55 to maximum of 5.75.its mean and standard deviation of 4.04225 and 0.5946151 respectively. The standard deviation for the size variable (0.595) is supportive for the variation of size between banks in the industry which was only 59.5%.

The mean and standard deviation of Equity to Total Assets ratio (CAR) are 13.52254 and 15.96458 respectively. Cost to Income ratio (CIR) which indicates the efficiency of expense management also obtained a mean of 38.57833 and a standard deviation of . 19.06028. The liquidity aspect of the banks which measured as Liquid Assets to Total Asset (LIQ) has a mean 15.63625 and a standard deviation of 15.75543. The loan deposit ratio and diversification also shows a mean of 52.42358 and 9.3408 , and a standard deviation of 22.34148 and 15.45408.Growth of deposit (GD) has a mean of 52.4236 and a standard deviation of 22.34148.The mean value (52.42) shows that on average bank deposit grows 52.42% . In terms of Branch expansion (BRA) a minimum 4 and a maximum 1280 branch was opened by banks.

Concerning industry specific indicators the mean and standard deviation of concentration (HHI), market share (Mkt-Share) .395, 7.557959 and, .039215, 12.89799 respectively. 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. and that of bank sector development(BSD) is the mean of 29.556 and a standard deviation of 3.083226.it shows that on average 29.6% of the Ethiopian economy contributed by banking sectors. For macroeconomic variables, the mean of RGDP and INF are 9.917 and 12.3 and a standard deviation of GDP and INF are 1.002988 and 8.310447 respectively.The maximum value(11.4) and the minimum(8) of RGDP growth rate shows that during the study period Ethiopia was registered the highest economic growth and also the highest inflation rate was 34.1% and the lowest rate 2.8%.

6.2. Measuring Market Concentration and Share

The most common measures of market concentration are the Herfindahl –Hirschamn Index and the concentration ratio (CR) (Scherer and Ross, 1990; Morris, 1984; Agu, 1992). Both simplicity and limited data requirements make the k bank concentration ratio one of the most frequently used measures of concentration in the empirical literature. CRk ranges in value from 0 to 1. A CRk value closer to 0 implies a minimum bank concentration while a value near to 1 shows maximum concentration.

Table 3: Market Concentration ratio for Bank Total Asset, Deposit and Loan and Advance (2009-2018)

Type	Conc. ratio	Year										Average value
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Asset	CR3	72.2	71.5	74.9	76.4	76.2	76	72	73	73	70	73.513
	CR5	83	85.13	84.6	83.8	84	79	80	80.1	76.3	83	81.868
Deposit	CR3	76.9	72.7	74.5	83.5	76.6	76	76	73	71	71.5	74.463
	CR5	87.4	83.1	83.5	88.8	83.2	83	82	80	77	76.5	81.955
Loan & Advances	CR3	70.1	56.3	71.5	75.6	72.6	73	66	58	53	50.1	64.475
	CR5	86.6	74.4	82.8	75.6	82.2	82	75	69	65	62.1	75.475

Source; own computation, 2019

From table 3 measure of market concentration ratio in terms of asset concentration in all years the concentration value of top three and top five banks is on average more than 73 and 81 percent. This implies that there is more concentration. In terms of deposit average concentration value for top three and top five banks are 74 and 81 respectively. In addition to this, the concentration value of loan and advances for top three and top five is 64 and 75.5. Generally there is more concentration ratio in terms of asset, deposit and loan and advance in Ethiopia banking sector.

6.2.1. The Herfindahi-Hirschman Index (HHI):

HHI is calculated by squaring the market share of each firm competing in a defined geographic banking market and then summing the squares. The HHI can range from zero in a market having an infinite number of firms to 10,000 in a market having just one firm (with a 100% market share). The HHI, as a measure of concentration, is the extent to which a few banks dominate market shares in respect of total assets, loans or deposits. The Hirschman Herfindahl index of concentration is the summed square market shares of all banks in the market,

bounded by 0 and 1:0 ≤ H ≤ 1, i.e., with pure monopoly H =1 and perfect competition H = 0. Or, equivalently, an HHI value near 0 suggests existence of many small banks, while an HHI"1 value near 1 suggests the existence of few big banks.

It is commonly accepted that HHI below 0.1000 indicate non-concentrated, between 0.1000 and 0.1800 moderately concentrated and indices above 0.1800 imply concentrated.

Table 4 : HHI for Sample Bank Total Asset, Deposit and Loan and Advance (2009-2018)

Meas.	**Type**	Year									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
HHI	Asset	0.329	0.318	0.388	0.424	0.424	0.435	0.384	0.422	0.434	0.397
	Deposit	0.364	0.338	0.379	0.318	0.429	0.435	0.438	0.423	0.415	0.42
	Loan& Adva.	0.236	0.159	0.334	0.40	0.337	0.364	0.292	0.229	0.185	0.167

Source; own computation, 2019

Table 4 revealed that the value of HHI asset in all years more than 0.3 it implies that the sector is more concentrated and the same with asset, the value of HHI deposit more than 0.3.In terms of loan and advances the value of HHI loan& advances it is moderately and more concentrated.

6.2.2. Market Share

Table 5 : Market share for Bank

	Market share for Bank Asset (in %)									
Bank Name	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AWASH	6.7	7	6	5.4	5.8	5.6	5.5	4.5	4	3
BOA	2.5	4.8	4.2	3.5	4	3	3	4.2	4	5
BUNNA	0.6	1	1.5	0.6	1	1	1.6	2	1.5	2
CBE	55	54.5	61	64	64	65	65	63	65	62
CBO	2	2.4	2.7	2.5	2.2	2	2.5	3	4	4
DASHEN	10.5	10.5	8.1	7.4	7	5.4	5.2	6	2	5
LION	1	1.5	1.7	1.2	1.1	1.2	1.5	2	1.5	3
NIB	4.8	3	1	3.4	3.5	3.5	4	3.5	4.5	4.3
OIB	5	2	2	2.5	2.4	5	2.5	3	3.5	4
UNITED	5.1	5.6	5	4	4	3.8	4	3.8	4	3.3
WOGAGEN	6	6	5.2	4.5	3.5	3.5	3.8	3.5	4	3
ZEMEN	0.8	1.7	1.6	1	1.5	1	1.4	1.5	2	1.4
Total	100	100	100	100	100	100	100	100	100	100

Source; own computation, 2019

In terms of Bank asset from the above table 6 observed that in all year's government owned bank (CBE) has the highest market share in Ethiopia banking sector. From the private owned bank Dashen bank has more shares.

Table 6: Market share for Bank Deposit (in percentage)

	Market share for Deposit (%)									
Bank Name	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AWASH	7.3	6.7	5.8	34.5	5.5	5.4	5.3	3.5	2	2.5
BOA	2.8	4	3.8	2.5	3.6	3	3	3.1	3.6	4
BUNNA	0.3	0.4	0.4	0.3	0.7	0.8	0.9	1.2	1.3	1.4
CBE	58	56	60	44	64.5	65	65.4	64.2	63.5	6.4
CBO	1.5	2	3	2	2.8	2.6	2.3	3.2	4.5	3.8
DASHEN	11.6	10	8.7	5	6.6	6	5.2	5	5	5
LION	0.96	1.4	0.6	0.6	0.9	0.8	1.2	1.4	1.6	1.8
NIB	4.5	4.4	4	2.3	2.8	2.6	2.6	2.8	2.4	2
OIB	1	1.8	1.6	1.1	2	2.7	2.4	3	3.5	3.8
UNITED	6	6	5	3	3.8	4	3.6	4	3.9	3
WOGAGEN	4.5	5	4.5	2.5	3.5	3.4	3	3.5	3.5	3.3
ZEMEN	0.4	0.7	1	0.7	1.2	1	1	1.4	1.4	1.5
Total	100	100	100	100	100	100	100	100	100	100

Source; own computation, 2019

Regarding with market share of bank deposit CBE has the highest market share in year 2015 (65.4%).Awash (34.5%) and Dashen(11.6%) have the highest market share from private owned banks.

Table 7 : Market share for Loan and Advance (in percentage)

Bank Name	Market share for Loan and Advance (in %)									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AWASH	10.5	9.1	6	5.6	8	7	8	7.5	7	6
BOA	5.3	9.4	6	5	4	4.5	4.7	7	7.5	7
BUNNA	1	0.8	1	1.5	2	1	2	2.5	3	2.3
CBE	42	30	55.5	62	56	58.5	52	46	39	37
CBO	0.7	1	0.6	1	1	1.4	3.8	5	6	6.5
DASHEN	18	17.2	10	8	9	7	7	6	8	9
LION	2	3	1	1	2	2	2	3	3	4
NIB	1	7.4	4.3	4	5	4	4.5	4	5.5	6
OIB	1.5	2	1.6	1.7	1	2	3.5	5	5	6.7
UNITED	10	9.5	7	5	5.5	6	5	6	7	6
WOGAGEN	6.5	8.6	5.5	3.9	5	4.6	5	5	7	6.5
ZEMEN	1.5	2	1.5	1.3	1.5	2	2.5	3	2	3
Total	100	100	100	100	100	100	100	100	100	100

Source; own computation, 2019

Table 7 revealed that government owned bank (CBE) registered the highest market share in year 2014(58.5%) and lowest in year 2010(30%). From private owned banks Dashen bank registered the highest percentage in 2009(18%) and lowest share by CBO in 2009(0.7%).

6.3. Econometrics Regression

6.3.1. Regression Diagnostic Tests

In order to determine the validity of the model, the presence of normality, heteroscedasticity and multicollinearity tests were treated well.

i. **Normality Test**

According to Shapiro-Wilk W test for normal data the data is not normal if the p value is less than 0.05. If p value is greater than 0.05 the null hypothesis that states the error term of the model is normally distributed will be accepted (or we have enough evidence to say the population is normally distributed)

Table 8: Shapiro-wilk w normality test for ROA

Variable	Obs	W	V	Z	Prob>z
ROA	120	0.96173	3.683	2.921	0.00175

Table 9: Shapiro-wilk w normality test for ROE

Variable	Obs	W	V	Z	Prob>z
ROE	120	0.79768	19.469	6.651	0.00000

From the above table 9 and 10, the Shapiro-Wilk W test statistic is significant. The alternative hypothesis is that the distribution of the residuals is not normal, here the p - value is 0.001 and 0.000 we failed to reject the alternative (at 99%). Revealed that residuals are not normally distributed in the study and concluded that there is the problem of normality in the models.

ii. **Hetroscedasticity Test**

The homoskedasticity is one of the assumptions of the CLRM which states that the variance of the errors must be constant. If the errors do not have a constant variance, they are said to be heteroskedastic (Brooks, 2008). As noted in (Brooks, 2008). STATA 14 output for Hetroscedasticity test in this study revealed that the value of p is 0.00, which is quite less than the standard that is 0.05. So, it can be concluded that there is heteroskedasticity that means the squared residual is not correlated with explanatory variables (homoskedastic) or the variance for error term is constant.

Table 11: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance
chi2 (14) = 15.41
Prob > chi2 = 0.3509

iii. **Multicollinearity Test**

Among several indicators variance inflation factor (VIF) and inspection of partial correlations is used for this particular study (Gujarati, 2004). When the collinearity of the variable with the other regressors increases, VIF also increases and in the limit it can be infinite. The larger the value of VIF, the more “troublesome” or collinear in the variable will be. As a rule of thumb, if the VIF of a variable exceeds 10, which will happen if R2 exceeds 0.90, that variable is said be highly collinear.

Table 10: Variance Inflation Factors (VIF)

Variable	VIF	1/VIF
SIZE	7.85	0.127325
Branch	6.30	0.158716
OWN	5.69	0.175605
LD	3.77	0.265124
CIR	3.61	0.276691
GD	3.52	0.284391
CA	2.66	0.375765
DIV	2.66	0.375938
LIQ	2.51	0.399085
INF	2.07	0.482594
HHIasset	1.78	0.560679
MktShare	1.63	0.613261
BSD	1.52	0.659964
RGDP	1.41	0.708451
Mean VIF	3.36	

Source: Own Computation on STATA14

Decisions mean values of vif for all explanatory variables are less than 10; we conclude that there is no strong multicollinearity among explanatory variables included in the model.

6.3.2. Model Selection Criteria

According to Brooks (2008), there are fixed effect and random effect model. Therefore; the first issue is that choosing between fixed effects (FE) and a random effects (RE) model based on the Hausman test, which helps to identified whether individual effects are fixed or Random.

Therefore, the Hausman test hypothesis was formulated as follow:

```
Test:  Ho:  difference in coefficients not systematic
        chi2 (13) = (b-B)'[(V_b-V_B) ^ (-1)](b-B)
                =       8.29
        Prob>chi2 =      0.8244
        (V_b-V_B is not positive definite)
```

If the p-value for the Hausman test is less than 0.05, accept the null hypothesis indicating that the random effects model is not appropriate and that the fixed effects specification is to be preferred. Based on this fact, , p-value for the Hausman test was 0.8244, i.e.greater than 0.05, so accept the null hypothesis, running random effect model is appropriate for ROA.

```
Test:  Ho:  difference in coefficients not systematic
       chi2(13) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                =       77.47
        Prob>chi2 =      0.0000
        (V_b-V_B is not positive definite)
```

According to Hausman test hypothesis if the p-value is less than 0.05, indicating that the fixed effects model is preferred to ROE.

6.3.3. Regression Result

6.3.3.1. Random effect Regression output for ROA

```
Random-effects GLS regression                   Number of obs     =       120
Group variable: Bank                            Number of groups  =        12

R-sq:                                           Obs per group:
     within  = 0.2950                                         min =        10
     between = 0.7627                                         avg =      10.0
     overall = 0.4099                                         max =        10

                                                Wald chi2(14)     =     72.93
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000
------------------------------------------------------------------------------
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        SIZE |   .8647048   .4479631     1.93   0.054**    .0132867   1.742696
```


CA	.0043601	.0114662	0.38	0.704	-.0268334	.0181132
LIQ	-.0109195	.0095493	-1.14	0.253	-.0296358	.0077968
LD	-.0107537	.0082623	-1.30	0.193	-.0269474	.00544
DIV	.018625	.0100308	1.86	0.063***	.0382849	.0010349
CIR	-.1750873	.0586046	-2.99	0.003***	-.2899503	-.0602243
GD	.034433	.0138183	2.49	0.013***	.0073496	.0615164
Branch	.0025739	.0010648	2.42	0.016**	.004661	.0004868
OWN	.6993531	.8172104	0.86	0.392	-.90235	2.301056
MktShare	.0064254	.0045887	1.40	0.161	-.0025682	.015419
HHIasset	7.524982	3.236873	2.32	0.020***	1.180827	13.86914
BSD	.0106267	.0061383	1.73	0.083*	.0014041	.0226574
RGDP	.0968629	.112586	0.86	0.390	-.1238016	.3175274
INF	-.0170609	.0164634	-1.04	0.300	-.0493286	.0152068
_cons	1.312881	2.600734	0.50	0.614	-3.784464	6.410226

sigma_u	0
sigma_e	1.0006864

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Source; Own computation on stata14

From the random effect regression output for ROA, corr (u_i,X)=0 shows that differences across units are uncorrelated with the regressors. The probability value of F-statistic/Wald tests of P (0.00) <0.01 rejects the null hypothesis and it implies that all the regression models have got significant explanatory power and shows that all the coefficients in the model are different from zero.

6.3.3.2. Fixed Effect Regression Output for ROE

Fixed-effects (within) regression — Number of obs = 120
Group variable: Bank — Number of groups = 12

R-sq:
Within = 0.3347
Between = 0.0102
Overall = 0.0342

Obs per group:
min = 10
avg = 10.0
max = 10

F(13,95) = 3.68
corr(u_i, Xb) = -0.3539 — Prob > F = 0.0001

ROE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
SIZE	.0021177	5.637877	0.00	1.000	-11.19472	11.19048
CA	.6582933	.2090277	3.15	0.002***	.2433208	1.073266
LIQ	-.058561	.1014828	-0.58	0.565	-.2600299	.1429078
LD	.3206297	.0993447	3.23	0.002***	.1234056	.5178539
BSD	.0778097	.0702884	1.11	0.271	-.0617303	.2173498
DIV	.2637	.2854365	0.92	0.358	-.8303631	.3029631
HHIasset	76.31863	30.71679	2.48	0.015***	15.33808	137.2992
CIR	-1.624028	.5880148	-2.76	0.007***	-2.791385	-.4566714
MktShare	.1256419	.0435579	2.88	0.005***	.0391685	.2121153
RGDP	.5526068	1.043211	0.53	0.598	-1.518429	2.623642
INF	-.1469017	.1538668	-0.95	0.342	-.452366	.1585625
Branch	.0070258	.0105121	0.67	0.506	-.0138434	.0278951
GD	.121506	.134822	0.90	0.370	-.1461496	.3891615
_cons	8.918596	23.07502	0.39	0.700	-36.89111	54.7283

sigma_u	26.260527	
sigma_e	9.3837498	
rho	.88677105	(fraction of variance due to u_i)

F test that all u_i=0: F (11, 95) = 15.70 — Prob > F = 0.0000

* Significant at 10%; ** Significant at 5%; *** Significant at 1%
Source: Own computation on STATA 14

From the fixed effect regression output for ROE, corr (u_i, Xb) = -0.3539 shows that the error ui are correlated with the regressors in the fixed effect model.rho =0.88677105, it is known as the intraclass correlation and revealed that 88.67% of the variance is due to differences across banks. The probability value of F-statistic of P (0.0001) <0.01 rejects the null hypothesis and it implies that all the regression models have got significant explanatory power. .

6.3.3.3. Analysis of Regression Output

The following discussion includes only the significant variables that determine the dependent variables (profitability) in model.

- **Bank Size and ROA: -** It uses the total assets of the bank (log). Bank size is significant and positively related with Ethiopian commercial banks profitability at 5% significant level with a p value of 0.054. The coefficient of bank size 0.0865 shows holding other variables constant a one percent change in bank size will have about 0.086 percent change in Ethiopian commercial banks profitability. The result of this study is consistence with the result of other researchers Sufian and Habibullah, 2009; Kosmidou, 2008; and Kosmidou et al, 2006) who found a significant positive relationship between bank size and profitability (ROA). The positive coefficient indicates that larger commercial banks tend to earn higher profits than smaller commercial banks, and vice versa.It may conform that larger banks could be benefited from economies of scale.
- **Cost-Income ratio (Operational Efficiency) and Profitability (ROA & ROE):-** The coefficient of the ratio of cost to income, which provides information on the efficiency of the company regarding expenses relative to income, was negative and highly statistically significant at 1% significant level with ROA&ROE (p -value of 0.003& 0.007) respectively .The coefficient of operation efficiency is negative 0.175&1.624 .This tells that a change in one percent of operation efficiency will have an effect to a change in ROA in negative 0.175% and a change in one percent of operation efficiency will have an effect to a change in ROE in negative 1.624%. The result of the study is consistent with Pasiouras and Kosmidou (2007), and Kosmidou (2008), Tesfaye,2013;Yalemselam, (2018). Thus, giving high consideration for expense management is vital to be profitable in the banking industry in Ethiopia.
- **Income Diversification and ROA: -** The study also agrees with Hypothesis that there is a positive significance relationship between income diversification and profitability of banks. The ratio of non-interest income to total income, which measures the level of diversification of a bank's activities, is found to have statistically significant (p-value=0.063) at 10% and positive impact on bank profitability particularly it is measured by ROA. The coefficient 0.019 tells that a change in one percent of income diversification will have an effect to a change in ROA in 0.175%. A positive and significant association between this variable and profitability reveals that commercial banks in Ethiopia earned a considerable proportion of their income from sources other than interest over the study period. The result of the study also consistent with (Sufian (2011) ,Amdemikael (2012) and Tesfaye(2013) conducted in Ethiopia.
- **Growth Deposit and ROA: -** Regarding with deposit growth of a bank, there is a positive significance relationship between growth deposit and profitability of banks. It Reflect bank's growth and it is measured by the annual growth of the sum of its institutional and clientele deposits, is found to have statistically significant (p value=0.013) at 1% and positive impact on bank profitability particularly it is measured by ROA. The coefficient 0.034 tells that a change in one percent of growth deposit will have an effect to a change in ROA by 0.034%. It implies that a high deposit growth of a bank increase profitability of the bank.
- **Branch Expansion and ROA: -** In the regression output branch expansion has positive relation with profitability. The result shows positive significant relationship (p-value 0.016) at 1 % significant level. But it does support research hypothesis of a positive relationship. It consistent with the study by Selamawit (2016).
- **Concentration (HHI) and Profitability (ROA&ROE):-**With regard to the set of exogenous variables, the result suggests a positive relationship between bank concentration and profitability in Ethiopia banking industry (both ROA and ROE are significant at 1%, p-value =0.020& 0.015 respectively) in line with Hypothesis (there is a positive significant relationship between concentration and bank profitability). The coefficient 7.525 implies that a change in one percent of market concentration (HHI) will have an effect to a change in ROA by 7.525% and the coefficient 76.32 tells that a change in one percent of concentration will have an effect to a change in ROE by 76.32%. The positive significant correlation of this variable could indicate a high degree of concentration.Banks in highly concentrated markets tend to earn monopoly profits. Thus,the positive sign of concentration may characterize the nature of Ethiopianbanking sector may need for more competition and more entry into thebanking market. Thus, the result are consistent with the findings of Staikouras and Wood (2003) and Molyneux

and Thornton (1992) that there is a positive and significant relationship between bank concentration ratio and bank's profitability (both ROA&ROE).

- **Banking Sector Development and ROA;** There is a positive significance relationship between banking sector development and profitability (ROA), is found to have statistically significant (p value=0.083) at 10% .The coefficient 0.106 implies that a change in one percent of banking sector development will have an effect to a change in ROA by 0.106%.
- **Capital Adequacy and ROE;**. In the regression results which agree with Hypothesis number 2 that said there is positive significant (p-value=0.002 at 1% level of significance) relationship between capital adequacy and profitability. The coefficient 0.658 revealed that a change in one percent of capital adequacy will have an effect to a change in ROE by 0.658%. The empirical finding is also consistent with the findings of Staikouras and Wood (2003), Goddard et al. (2004), Pasiouras and Kosmidou(2007), and Kosmidou (2008 who pointed out that those well-capitalized banks face lower risks of going bankrupt, building their credit worthiness, and reducing their cost of funding which will ultimately enhancetheir profit margin.
- **Loan-Deposit Ratio and ROE: t**he result suggests that a positive relationship between loan to deposit and ROE are significant at 1%, p-value =0.002).The coefficient 0.32 implies that a change in one percent of loan to deposit ratio will have an effect to a change in ROE by 0.32%.
- **Market share (Deposit) and ROE:** The regression result also showed that coefficient of market share is positive; the coefficient on Ms is statistically significant at least at 5% level (p-value=0.005). The coefficient 0.126 implies that a change in one percent of market share will have an effect to change in ROE by 0.126%. In this study it has only significant effect on ROE but not significantly affect ROA. It fails to support market share has a positive effect on profitability because it only have a significant effect on ROE. Maudos (1998) notes that market share is a poor proxy for efficiency and proposes inclusion of a direct measure of efficiency to test the efficient market hypothesis.

7. Conclusion and Recommendation

7.1. Conclusion

The main objective of this study was to examine the structure conduct and performance analysis in Ethiopian Banking Industry. From the random effect regression output for ROA, among the explanatory variables there are seven significant variables in the model, the regression result shows that, bank size which was a bank specific variable, had a negative and statistically significant relationship with ROA. Similarly, growth deposit (GD) had a positive and strong statistically significant relationship with profitability. Cost income ratio (CIR) had also a negative and strong statistically significant relationship with profitability. In addition to this, branch expansion had a negative and strong statistically significant relationship with profitability. Diversification had a positive and statistically significant relationship with ROA. Among Industry specific factor, concentration (HHI) had a positive and strong statistically significant relationship with ROA. Banking sector development (BSD) had a positive and statistically significant relationship with ROA. From macroeconomic factor, real GDP growth rate had positively and inflation rate had negatively relationship with profitability but not significant in the model.

From the fixed effect regression output for ROE, the regression output revealed that capital adequacy (CA) one of a bank specific factor had a positive and statistically significant relationship with ROE. Loan to deposit ratio (LD) and concentration (HHI) has a positive and statistically significant relationship with ROE, respectively. Cost-income ratio (CIR) had a negative and strong statistically significant relationship with profitability. Market share (deposit) also had a positive and significant relationship with ROA. The same with ROA, macroeconomic factor RGDP growth rate and Inflation rate positively and negatively affect ROE but not statistically significant in the model.

Generally, the major determining variables of bank profitability are internal factors such as bank size, capital adequacy, and cost income ratio, loan to deposit ratio, income diversification, and growth deposit and branch expansion in the study area.

7.2. Recommendation

Based on the research findings, the following possible recommendations are forwarded to all the concerned bodies.

- In terms of asset, deposit and loan indicators government owned bank (CBE) has highest share in the study period. Even though there was many private banks established in Ethiopia their market share was small. There should be work on to increase their total asset that may be through; collecting deposit from customers, increasing shareholder's equity, or other equity and debt financing ways or may be through merger and acquisitions to enhance their profitability.
- Management bodies of all Ethiopian commercial banks should strive to strengthen the bank specific factors like bank size, capital adequacy, and cost income ratio, loan to deposit ratio,

income diversification, and growth deposit and branch expansion. Since, they are found to be the most significant variables that affect profitability of Ethiopian commercial banks measured by ROA and ROE.

- The Ethiopian banking capital structure provides promising profit for well capitalized banks; therefore stake holders are advised to build large capital to asset ratio through, for instance ,selling their share for better solvency and reducing funds costs ,and ultimately to succeed their objectives of maximizing profit.
- Efficiency on cost minimizing has a great contribution in profit ability of Ethiopian commercial banks. Hence, the study provides suggestion for managers to strive in managing properly the level of non-interest expenses like administration expenses.

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