THE IMPACT OF CAPITAL STRUCTURE ON PROFITABILITY OF CMMERCIAL BANKS IN ETHIOPIA (CASE STUDY ON NINE SELECTED COMMERCIAL BANKS INETHIOPIA).

RESEARCH PAPER SUBMMITTED TO DEPARTMENT OF ACCOUNTING AND FINANCE IN PARTIAL FULLFILMENT OF BACHELOR ARTS DEGREE IN ACCOUNTING AND FINANCE

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COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

JUNE, 2019

WOLKITE, ETHIOPIA

Statement of declaration

Wolkite University

I declare that this senior essay prepared by Belayneh Minuye entitled: *The impact of capital structure on profitability of Commercial Banks in Ethiopia* and submitted in partial fulfilment of the requirements for the BA Degree in Accounting and Finance complied with the regulations of the University and meets the accepted standards with respect to originality and quality.

Submitted by: Full Name----------Signature----------Date---
Approved by: Name of Advisor----------Signature----------Date--
Name of Examiner---------- ……..Signature---------- Date-

Statement of certification

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This is to certify that Belayneh Minuye has carried out his research work on the topic entitled "*The impact of capital structure on profitability of Commercial Banks in Ethiopia*". The work is original in nature and is suitable for submission for the award of the BA Degree in Accounting and Finance.

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Acknowledgements

First of all, I praise the name of Almighty God who gave me power and patience in every endeavour of my life.
I would like also to extend my deep indebtedness to my advisor Mr Melese Zeberga for his valuable comments, encouragements and guidance at various stage of the study.

I would also like to convey my sincere thanks to my family, specially my Mother and brother Alaye Minuye for their unconditional love and prayers encouraged me throughout my study in Wolkite University.

Last but not the least, my special thanks goes to my friends in particular Getasew muche, Habtamu Kindu, Birhan anmut Bewketu dagne, Atkiltu Lemma and others for those who helped me in any form of assistance God bless you indeed.

Abstract

The choice of capital structure is one of the most important strategic financial decisions of firms. Since financing decisions influence profitability and hence firm's value, this study examined the impact of capital structure on profitability of core business operations of commercial banks in Ethiopia. In order to meet the objectives of this study a quantitative panel data methodology as bee used. Explanatory research designs has been used to conduct the study to form model by assigning the following variables. These were total debt to asset, deposit to asset loan to deposit, spread, asset size and growth.

The panel data obtain from the audited financial statements of nine commercial banks and National Bank of Ethiopia for the period of ten years (2007– 2016). The panel data fixed effect estimation model was applied for the data analysis through Eview8.1 statistical package in order to conduct the study by considering variables and their impact on profitability of nine commercial banks in Ethiopia. The research concerned descriptive statistics and inferential statistics to analyze data and presentation and also regression model has been used to show impact of capital structure on profitability of nine commercial banks in Ethiopia.

The collected data from the audited financial statements and balance sheet were analyzed by test assumptions and regression and correlation analysis. The regression resulted that around 48%that the selected variables was affected the (NIM) of commercial banks whereas around 37% observed the selected variables were affected or can be impact of NIM while, 63% were covered by not selected variables in study. Except two variables that is deposit to asset and loan to deposit other variables were significant. And National Bank of Ethiopia also recommended reconsidering to raise the minimum capital requirement for banks. Future researchers also recommended assessing the overall performance of banks and other business sectors in the area of this research.

Key words: *Banks, Capital structure, Profitability, core business operation, and panel data.*

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List of Acronyms & Abbreviation

AIB - Awash international bank

BOA - Bank of Abyssinia

CLRM-Classical Linear Regression Model

CBE-Commercial bank of Ethiopia

DB - Dashen bank

NBE - national bank of Ethiopia

UB- United bank

WB - Wegagen bank

LIB= Lion international bank

COB-Cooperative bank of oromiya

EBIT- Earning before income tax

ROA-Return on asset

SBB-Supervision of banking business

CBB-Construction business bank

NPV-Net present value

EPS-Equity per share

ROE-Return on equity

GPM-Gross profit margin

EVA-Economic value added

TDTF-Total debt to total fund

TDTE-Total debt to total equity

EQR-Equityratio

CHAPTER ONE

INTRODUCTION

1,1BACK GROUND OF THE STUDY

Capital structure is defined as mix of debt and equity that a firms use in its operation. The capital structure of firms presumably is affected by considerations of bankruptcy cost, agency cost. Capital structure refers to several alternatives that can be adapt by a firm to get the necessary funds for its investing activities in a way that is consistent with its priorities.

The importance of capital structure is increase the value of firm by increasing the market price of shares and securities, utilisation of available funds, maximisation of return, minimisation of cost of capital, solvency or liquidity position, flexibility by providing expansion or reduction of debt capital etc. are some of advantages of capital structure.

According to Modigliani and Miller (1958), the literature on capital structure has been expanded by many theoretical and empirical contributions. For non-financial firms the empirical literature has generally focused on particular variables that have to be finding consistently correlate with leverage such as: age, size, growth, profitability, market-to-book ratio, collateral value and dividend policy. On the other hand, the capital structure of banks is still a relatively under-explored area in the banking literature. Currently, there is no clear understanding on how banks choose their capital structure and what factors influence their corporate financing behaviour (Amidu, 2007).

The relationship between capital structure and profitability is one that receives considerable attention in finance literature. However, in the context of banking industry, the subject receives a limit research attention (Taani, 2013.In this study, the selection of explanatory variables is based on the alternative capital structure, profitability theories and previous empirical work. As result, the set of proxy variables includes six factors: the ratios of short-term debt to total assets, long-term debt to total assets, total debt to total assets and profitability (measured by return on equity).

As to the knowledge of the researcher there were few studies related to this title, the Impact of Capital Structure on Profitability of Commercial Banks in Ethiopia.

Weldemikael (2012) on the relationship between leverage and firm specific (profitability, tangibility, growth, risk, size and liquidity) determinants of capital structure decision of banks, as well as Amdemikael (2012) also assessed the factors that affect bank profitability in Ethiopia, they were used limited measures of leverage/ capital structure and profitability in their study. For example, Usman (2013) used only long-term debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability and Weldemikael (2012) applied total debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability. Besides, Amdemikael (2012) managed his study using ROA as a measure of profitability and Equity to asset ratio as a measure of capital strength. All of the above studies failed to investigate the impact of the main external financing source of banks, deposit on profitability of core business operations, and emphasized on overall performance of banks. But, this study examined the significant relationship between the dependent and independent variables it also examined the significant relationship and effect of control variables in addition to the independent variables.

The researcher examined the following independent variables to show the impact of capital structure on profitability of commercial banks in Ethiopia. These variables were total debt to asset, loan to asset, loan to deposit, spread, growth and asset size. This was assumed to helpful the financial managers efficient in equipping with applied knowledge of the potential problems in profitability and capital structure, as well as determining their optimal level of capital structure to achieve optimum level of firm's profitability and hence shareholder's wealth.

All of the above studies failed to investigate the impact of the main external financing source of banks, deposit on profitability of core business operations, and emphasized on overall performance of banks. As a result, the researcher filled the gap by assigning the above issues to financial managers as well as operation of commercial banks in Ethiopia.

1.2 Statement of the problem

The choice of capital structure is one of the most important strategic financial decisions of firms. However, it has been the subject of substantial debate and investigation. The debate on what drives capital structure decisions and its impact on profitability is still open. Since the seminal work of Modigliani and Miller (1958), a number of theoretical literatures which led to the formulation of alternative theories were developed, such as the static trade off theory, pecking order theory and agency cost theory.

These theories states about a number of specific factors that may affect the capital structure and profitability of firms such as size, tangibility, growth, risk, liquidity, age, and dividend pay- out as well as how the capital structure or financing decision affect the value of firms. However, the empirical evidence regarding the alternative theories is still debatable (Rajan&Zingales, 1995). For instance, static trade off-theory states that a firm's optimal debt ratio is determined by a trade-off between the tax advantage and bankruptcy cost of borrowing, holding the firm's assets and investment plans constant.

This theory assumes that higher profitability the lower expected cost of distress; hence, firms increase their leverage to take advantage from tax benefits. That is, profitability is positively related with leverage. Due to the free cash flow theory of Jensen (1986) agency cost theory also supports this positive relation. However, the pecking order theory of Myers &Majluf (1984) suggests that firms use debt only when the internal financing is not available and argues against the existence of target capital structure

According to this theory profitability is expected to have negative relationship with leverage. Only a few of the developed theories have been tested by empirical studies and the theories themselves lead to different, not mutually exclusive and sometimes opposed result and conclusion (Rajan& Zingales,1995). Morri& Beretta (2008) explained that numerous theoretical studies and much empirical research have addressed those issues, but there is no a fully supported and generally accepted theory; and the debate on the significance of determinant factors of capital structure and profitability of firm value is still open, Moreover, although earlier studies have great contributions to the theory of capital structure and profitability, they were limited to

developed financial system and restricted to non-banks. Less developed countries like, Ethiopia, received little attention in the literature.

According to Octavia & Brown (2008), the capital structure of banks is still a relatively under-explored area in the banking literature and the special nature of the deposit contract, the degree of leverage in banking and the regulatory constraints imposed on banks have meant that banks (and financial institutions in general) have been excluded in previous empirical studies on standard capital structure choice. However, understanding the determinants of capital structure and profitability as well as the impact of financing decision or capital structure on profitability is as important for banks as for non-banks firms.

In the contexts of Ethiopia, there were few studies in relation to determinants of capital structure and determinants of profitability distinctly studied by different researchers. Weldemikael (2012) on the relationship between leverage and firm specific (profitability, tangibility, growth, risk, size and liquidity) determinants of capital structure decision of banks, as well as Amdemikael (2012) also assessed the factors that affect bank profitability in Ethiopia, they were used limited measures of leverage/ capital structure and profitability in their study. For example, Usman (2013) used only long-term debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability and Weldemikael (2012) applied total debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability. Besides, Amdemikael (2012) managed his study using ROA as a measure of profitability and Equity to asset ratio as a measure of capital strength.

All of the above studies failed to investigate the impact of the main external financing source of banks, deposit on profitability of core business operations, and emphasized on overall performance of banks. In addition, in relation to explanatory variables past studies failed to investigate the impact of the main source of banks external finance, deposit and other factors such as loan to deposit, spread and growth of banks which believed to have great contribution to the core business operations of banks.

The aim of this study examined the impact of leverage or capital structure on profitability of commercial banks in Ethiopia with an emphasis on banks core business

operations. The result intended to equip financial managers with applied knowledge of the potential problems in profitability and capital structure, as well as determining their optimal level of capital structure to achieve optimum level of firms' profitability so that to meet wealth maximization goal of firms. Furthermore, it intended to serve as a base for policy makers in considering the minimum capital requirement of banks operating in the country.

1.3 Objective of study

The general objective of this study was to examine the impact of capital structure on profitability of 9 commercial banks listed in the National Bank of Ethiopia.

The specific objectives of this study were:

- To investigate the relationship between total debt to asset on profitability of core business operation of commercial banks in Ethiopia.
- To examine the impact of loan to deposit on profitability of commercial banks in Ethiopia.
- To examine the effect of deposit to asset on profitability of commercial bank of Ethiopia.
- To examine the effect of spread on profitability of commercial bank of Ethiopia.
- To examine the effect of growth on profitability of commercial bank of Ethiopia.
- To examine the effect of asset size on profitability of commercial bank of Ethiopia.

1.4 Research Hypothesis

To achieve the objectives of this study the following hypotheses were tested.

H1: There is negative and significant relationship between capital structures provide by Total Debt to Asset and profitability of commercial banks in Ethiopia.

H2: There is positive and significant relationship between capital structures provide by Deposit to Asset and profitability of commercial banks in Ethiopia.

H3: There is positive and significant relationship between Loan to Deposit and profitability of commercial banks in Ethiopia.

H4: There is positive and significant relationship between Spread and profitability of commercial banks in Ethiopia.

H5: There is positive and significant relationship between growth and profitability of commercial banks in Ethiopia

H6: There is positive and significant relationship between Asset size and profitability of commercial banks in Ethiopia.

1.5 Scope and limitation of the study

The scope of this study was limited to the examination of the impact of capital structure on profitability of commercial banks in Ethiopia over the period of 10 years (2007 to 2016. In order to make generalization from sample to population, and to increase number of observation of the study, a combination of the maximum number of banks and years in which audited financial statements available were taken into account. As a result, the researcher was achieved 90 number of observation by taking sample of the only 9 Commercial Banks that operating and provide audited financial statements during the period of 2007 to 2016. To meet its objectives, the study was limited to examining the impact of capital structure on profitability of banks using independent variables: Total Debt to Asset, Deposit to asset, Loan to deposit, Spread, growth, and Asset size, and the dependent variable is Net interest margin (as a measure of profitability of banks).). The major limitation that hinder the study were absence enough time to do the research, lack of resource constraint, to certain expenses which helps for betterment of research but failed to that. Secondly laboratory in- availability to get easily software, network access like E-view and internet.

1.6 Significance of the study

This study has significant role to play in filling gap in understanding of the impact of capital structure decisions on profitability of core business operations of banks in Ethiopia. And hence, the study could serve as reference for financial managers to equip them with applied knowledge of the potential problems in financing decisions of capital structure and profitability, as well as determining their optimal level of capital structure to achieve optimum level of firm's profitability so that to meet wealth maximization goal of firms. It also served as a reference for other researchers in the area of corporate finance. This study is also important for researcher to fulfil requirement in BA degree

in accounting and finance and also the study helps the researcher to enable having experience in research primarily with respect to have knowledge on related courses.

1.7 Organization of study

This research paper has five organized chapters. The first chapter presents; Introduction, statement of the problem, objective of the study, hypothesis the study, scope and limitation of the study and significance of the study. The second chapter of the study presents review of theoretical and empirical literature on capital structure and profitability. The third chapter presents the research design, data source collection and sampling techniques, model specification &variable description. The fourth chapter presents result and discussion of the study and finally chapter five presents conclusion and recommendation of the research paper of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

INTRODUCTION

The literature review section of the study covers the overview of the Ethiopian banking system and capital requirement, the theoretical and empirical studies review in the areas of capital structure and profitability. Moreover, it presents the variable summary and conceptual framework as well as the knowledge gap and conclusion.

2.1 Overview of the Ethiopian banking system and capital requirement

Banking system in Ethiopia was started in 1905 with the establishment of Abyssinian Bank. Its establishment was based on 50 agreements with the Anglo-Egyptian National Bank. A new development bank and two other foreign banks were also established in 1908 (Degefe, 1995 cited in Geda, 2006). However, in 1931 the Ethiopian government purchased the Abyssinian Bank and renamed it as the Bank of Ethiopia.

As stated in Degefe (1995) cited in Geda (2006), banking activity of the country was relatively expanded during the five-years of Italian occupation. During that time, the Italian banks were particularly active. As a result, most of the banks operating during this period were Italian banks. After independence from Italy's occupation, due to the paramount role of British in its strategic planning during the Second World War, Barclays Bank was established and it remained in operation in Ethiopia in the period of 1941 to 1943.

The State Bank of Ethiopia was established in 1943. However, Britain was against it, as a result, the process of the establishment of this bank was painful. Until 1963 the Bank of Ethiopia was operating as both a commercial and central bank. In1963.

It was remodelled into today' National Bank of Ethiopia (NBE). It was also re-established in 1976 and the Commercial Bank of Ethiopia (CBE) too. It was after this period many other banks were established and those banks were in operation before the 1974 revolution. Nevertheless, all privately owned financial institutions including three commercial banks, thirteen insurance companies, and two non-bank financial

intermediaries were nationalized on 1 January 1975. The nationalized banks were reorganized and one commercial bank Ethiopia (CBE), a national bank, two specialized banks, that is, the Agricultural and Industrial Bank, renamed recently as the Development Bank of Ethiopia and a Housing and Saving Bank, renamed lately as the Construction and Business Bank (CBB), and one insurance company (the Ethiopian Insurance Company) were formed (Degefe 1995 cited in Geda 2006).

Following the downfall of the (DRG) regime in 1991 and the 1992 liberalization policy, these financial institutions were reorganized to operate in a market-oriented policy framework. Furthermore, private financial institutions were also allowed to operate alongside the publicly owned institutions. As a result, currently, the major financial institutions operating in Ethiopia are banks, insurance companies and micro-finance institutions. The number of banks operating in the country reached 18 of which 15 are private, and the remaining 3 are state-owned (NBE, 2016/17). The sustainability and expansion of banking business operation requires maintaining a level of capital commensurate with the volume of their business operation to withstand adverse operational results and hence increase profitability. Therefore, the National Banks of Ethiopia issued the Licensing and Supervision of Banking Business Minimum Capital Requirement for Banks Directives No SBB/50/2011. As per this directive the National Bank of Ethiopia raised the minimum capital requirement for banks from Birr 75 million to Birr 500 million to all banks operating in the country to meet the new requirement by the end of June 2016 (NBE, 2011)

In relation to banks capital requirement, the Eco bank December 31, 2014 report states that the move will help to boost the financial stability of the Ethiopian banking sector and re position several underccapitalized private sector banks to play enhanced roles and slightly reduce the current concentration in the sector. Furthermore, it is expected that seven private sector banks that are yet to meet the new minimum capital requirement to collectively raise equity capital of about Birr 1.29 billion (USD63.54mn) over the next 18 months. However, while this exercise led to banking sector consolidation in countries such as Nigeria, will not expect this to happen in Ethiopia as the seven private banks could meet the minimum capital requirement prior to the June 2016 deadline (Eco bank, 2014). According to Economic banks (2014) while Ethiopian new minimum capital requirement is higher than that of East African

neighbours such as Kenya, Tanzania, and Uganda, it is lower than the minimum capital requirement for banks in Ghana, Zambia (foreign banks), and Nigeria.

2.2 Theoretical Review

This theoretical review part of the study is all about the review of the theories of capital structure and profitability or firm value.

2.2.1Theory of Capital Structure and profitability/ value of a firm

Ross (2003) states that a corporation can raise money (cash) from lenders or from shareholders. If it borrows, the lenders contribute the cash, and the corporation promises to pay back the debt plus a fixed rate of interest. If the shareholders put up the cash, they get no fixed return, but they hold shares of stock and therefore get a fraction of future profits and cash flow. The shareholders are equity investors, who contribute equity financing. The choice between debt and equity financing is called the capital structure decision. Capital structure refers to the firm's sources of long-term financing. Corporations raise equity financing in two ways. First, they can issue new shares of stock. The investors who buy the new shares put up cash in exchange for a fraction of the corporation's future cash flow and profits. Second, the corporation can take the cash flow generated by its existing assets and reinvest the cash in new assets. In this case the corporation is reinvesting on behalf of existing stockholders.

Financing arrangements determine how the value of the firm is sliced up. The firm can determine its capital structure. That is, the firm might initially have raised the cash to invest in its assets by issuing more debt than equity; now it can consider changing that mix by issuing more equity and using the proceeds to buy back some of its debt. Financing decisions like this can be made independently of the original investment decisions. The decisions to issue debt and equity affect how the pie is sliced (Ross, 2003).

A number of theories have been advanced in explaining the capital structure and profitability or value of firms. The existing theories of capital structures and profitability of firm value are explained as follows.

2.2.1.1 Modigliani and Miller (MM) theory

In corporate finance theories, the seminal work by Modigliani and Miller (1958) in capital structure provided a basis for the development of the theoretical framework within which various theories were about to emerge in the future. Modigliani and Miller (1958) reviewed their earlier position by incorporating tax benefits as determinants of the capital structure of firms. The key feature of taxation is that interest is a tax-deductible expense. A firm that performs taxes receives a partially offsetting interest tax-shield in the form of lower taxes paid. Hence, Modigliani and Miller (1963) proposed to use as much debt capital as possible in order to increase profitability and hence maximize the value of firms.

2.2.1.2. Static Trade-off Theory

Capital structure theories have diverse views on the relationship between leverage and profitability. The trade-off theory argues that firms generally prefer debt for tax considerations. Profitable firms would, therefore, employ more debt because increased leverage would increase the value of their debt tax shield (Myers, 1984). It states also that firms seek debt levels that balance the tax advantages of additional debt against the costs of possible financial distress. Apart from the tax advantage of debt, agency and bankruptcy costs may encourage highly profitable firms to have more debt in their capital structure. This is because highly profitable firms are less likely to be subject to bankruptcy risk because of their increased ability to meet debt repayment obligations. Thus, they will demand more debt to maximize their tax shield at more attractive costs of debt. For these considerations, the trade-off theory predicts a positive relationship between leverage and profitability.

2.2.1.3. Pecking order theory

The pecking order theory of Myers &Majluf (1984) argues in the contrary static trade-off theory. It advocates also that the firm will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures. Thus the amount of debt will reflect the firm's cumulative need for external funds. It concludes a negative association between leverage and profitability because high profitable firms will be able to generate more capitals through retained earnings and then have less leverage.

Therefore, it is expected that there is negative relationship between leverage and profitability ratio.

2.2.1.4. Agency cost theory

Agency theory focused on the costs which are created due to conflicts of interest between shareholders, managers and debt holders. Harris &Raviv (1991) explained the three types of agency costs which can help explain the relevance of capital structure as follows; Asset substitution effect: As debt to equity increases, management has an increased incentive to undertake risky (even negative NPV) projects. This is because if the project is successful, shareholders get all the upside, whereas if it is unsuccessful, debt holders get all the downside. If the projects are undertaken, there is a chance of firm value decreasing and a wealth transfer from debt holders to shareholder's underinvestment problem: If debt is risky (e.g. in a growth company), the gain from the project will accrue to debt holders rather than shareholders. Thus, management has an incentive to reject positive NPV projects, even though they have the potential to increase firm value. Free cash flow: unless free cash flow is given back to investors, management has an incentive to destroy firm value through empire building and perks etc. Increasing leverage imposes financial discipline. The free cash flow theory says that dangerously high debt levels will increase value, despite the threat of financial distress, when a firm's operating cash flow significantly exceeds its profitable investment opportunities. The free cash flow theory is designed for mature firms that are prone to overinvest. Due to the free cash flow theory of Jensen (1986) agency cost theory supports a positive relationship between capital structure and profitability.

2.3 Empirical studies on the impact of capital structure on profitability

Over the past several decades' corporate finance researchers devote considerable efforts to transform rationalism of capital structure into empiricism. The problem of developing a conclusive theory of capital structure and designing empirical tests those are powerful enough to provide a basis for choosing among the various theories is still unresolved. The literature on the relationship between firm performance and capital structure has produced mixed results (Taani, 2013).

Weldemikael (2012) on the relationship between leverage and firm specific (profitability, tangibility, growth, risk, size and liquidity) determinants of capital structure decision of banks, as well as Amdemikael (2012) also assessed the factors that affect bank profitability in Ethiopia, they were used limited measures of leverage/ capital structure and profitability in their study. For example, Usman (2013) used only long-term debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability and Weldemikael (2012) applied total debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability.

The empirical tests indicate that capital structure (especially TD and STD) negatively impacts performance measured by ROE. On the other hand, capital structure (LTD and TD) has negative significant impact on firm's performance measured by ROA. Furthermore, findings of this study suggest that there is a significantly positive relationship between Tobins Q (firm performance) and capital structure measured by LTD and STD. Finally, the results show that Tobin Q has a positive and significant relationship with size (as control variable) for all sectors under study except for property sector a negative effect on the Tobins Q observed. Farhad&Aliasghar (2013) also studied the relationship between capital structure and Profitability using data from 252 non-financial companies in the period from 1999 to 2008 in Tehran Stock Exchange. Consistent with earlier theories, found a positive association between the return on equity (ROE) and short-term debt. This suggests increasing short-term debts with low interest rate will lead to increase in profitability. Furthermore, the results revealed a negative association between ROE and long-term debt. So, when firms increase long-term debts, this results to decrease in profitability. Finally, the results also indicate a positive relationship between ROE and total debt.

For the purpose of this study, the data was extracted from the annual reports of sample companies. Correlation and multiple regression analysis were used for analysis. The results revealed a positive relationship between capital structure and financial performance. And also capital structure is significantly impact on financial performance of the firm showed that debt asset ratio, debt equity ratio and long term debt correlated with gross profit margin (GPM), net profit margin (NPM

Mohammadzadeha et al. (2013) in their study scrutinized the relationship between the capital structure and the profitability of pharmaceutical companies in Iran. To meet the purpose of the study, top 30 Iranian pharmaceutical companies defined as study samples and their financial data were gathered for the period of 2001-2010. In this study, the net margin profit and debts to asset ratio were used as indicators of profitability and capital structure, respectively and sales growth was used as a control variable.

Results showed that there was significant negative relationship between the profitability and the capital structure which means that the pharmaceutical companies established a Pecking Order Theory and the internal financing has led to more profitability. Apart from non-financial institutions, there are some empirical studies in the financial sectors. Taani (2013) examined the impact of capital structure on performance of Jordanian banks. The annual financial statements of 12 commercial banks listed on Amman Stock Exchange we the study which covers a period of five (5) years from 2007-2011. Multiple regressions will be applying performance indicators such as Net Profit **(**NP**),** Return on Capital Employed (ROCE), Return on Equity (ROE) and Net Interest Margin **(**NIM**)** as well as Total Debt to Total Funds **(**TDTF**)** and Total Debt to Total Equity (TDTE**)** as capital structure variables. The results showed that bank performance, which is measured by net profit, return on capital employed and net interest margin is to be significantly and positively associated with total debt; while total debt is found to be insignificant in determining return on equity in the banking industry of Jordan.

Opoku, Adu, &Anarfi (2013) also studied the impact of capital structure and profitability of listed banks on the Ghana Stock Exchange using a panel data methodology. Capital structure theories were utilized to provide the theoretical basis

for the work. The study considered all the 9 banks listed on the Ghana Stock Exchange over the period 2005-2012. The distribution patterns of data and applied statistical techniques used in the study include descriptive statistics, correlation analysis and regression analysis. The study variables also include Return on Asset, ROA. Economic Value Added **(**EVA**)** being the dependent variables and independent variables are: Total Leverage, Debt to Equity ratio, Total Liability of the banks, Size and the Age of the banks. The finding reviled that, profitability measured by returns on equity is inversely and significantly influenced by the total leverage ratio which is also dependent of the capital structure of the banks. The debt equity ratio of the bank has a positively significant relationship with returns on equity.

2. 4 Conclusion and knowledge gap

In the context of Ethiopia, while Usman (2013) examined the determinants of capital structure of large taxpayer share companies in Ethiopia, Weldemikael (2012) on the relationship between leverage and firm specific (profitability, tangibility, growth, risk, size and liquidity) determinants of capital structure decision of banks, as well as Amdemikael (2012) also assessed the factors that affect bank profitability in Ethiopia, they were used limited measures of leverage/ capital structure and profitability in their study. For example, Usman (2013) used only long-term debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability and Weldemikael (2012) applied total debt to total asset as a measure of leverage and the ratio of earnings before interest and tax (EBIT) to total asset as a measure of profitability. Besides, Amdemikael (2012) managed his study using ROA as a measure of profitability and Equity to asset ratio as a measure of capital strength. All of the above studies failed to investigate the impact of the main external financing source of banks, deposit on profitability of core business operations, and emphasized on overall performance of banks.

This study will be design to scrutinize the impact of capital structure on profitability of core business operations of Commercial banks in Ethiopia by using net interest margin (NIM) as measure of profitability of the core business operations of banks, and capital structure/ leverage (measured as Total Debt to Asset and Deposit to Asset) as well as taking in to account the effect of liquidity (as measured by Loan to deposit) on

profitability. Besides, in order to control the impact of other factors in the model the study used Size of banks (measured as book value of asset) and growth (measured as percentage increase and/or decrease from earlier period in assets of banks) as well as spread will use as control variables

2.5 variable summary and conceptual frame work

The seminal work by Modigliani and Miller (1958) in capital structure provided a basis for the development of the theoretical framework within which various theories were about to emerge in the future. Modigliani and Miller (1958) concluded to the broadly known theory of capital structure irrelevance where financial leverage does not affect the firm's value. By incorporating tax benefits as determinants of the capital structure of firms, Modigliani and Miller (1963) proposed to use as much debt capital as possible in order to maximize the value of firms. Furthermore, as stated in the theoretical review section of this paper, subsequently a number of concepts profitability of firm value and theories of capital structure such as the static trade-off theory, pecking order theory and agency cost theory were developed.

These theoretical concepts also tested by different empirical studies of different researchers in different business sectors around the world. In examining the impact of capital structure on profitability /performance as stated above in the empirical review section, a number of variables were used by different authors.

The summary of variable used by different researchers as stated above are:

Dependent variables: Profitability measured as return on equity (ROE), return on asset (ROA), economic value added (EVA), earning per share (EPS), return on capital employed, and net interest margin (NIM).

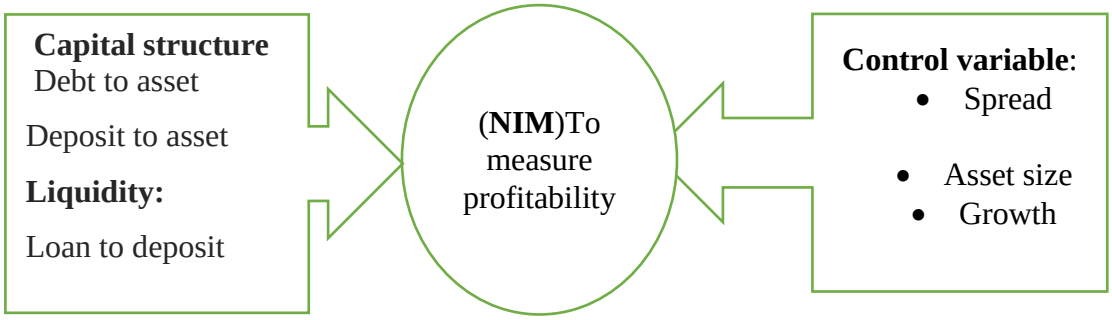
Independent variables: Capital structure related variables such as total debt to asset(TDA),), total debt to equity (TDEQ), Capital adequacy (equity to asset), short-term debt, log-term debt, deposit to total asset as a measure of bank leverage, total bank loan, other investment, liquidity risk, Asset quality, loan to asset, bank efficiency ratio, and loan to deposit etc.

Control variables: The control variables used in the above literatures are asset size, growth, and spread.

In the studies of Ethiopia however, in both case that is, in the study of determinants of capital structure and factors affecting profitability of banks only ROA and ROE used as a measure of profitability and Capital adequacy and total debt to asset used as independent variables to represent capital structure. The conceptual framework indicates that the capital structure of commercial banks affects their profitability.

Capital structure of commercial banks measured by Total Debt to Total Asset ratio with the concept that financing decisions through both the deposit and non-deposit liabilities of banks have impact on banks profitability. Furthermore, as the banking operation depends on deposit mobilization strategies and capacity of banks, Deposit to Total Asset Ratio is the major part of source of finance which ultimately affects profitability hence for the purpose of this study it is considered as a second measure of capital structure so that to scrutinize the impact of deposit and non-deposit liability on profitability. Likewise, with the concept of the relationship between liquidity and profitability loan to deposit ratio also considered as a liquidity measure, though there are different measures of profitability to be used as variables in measuring profitability of banks, this study considered Net Interest Margin (NIM) as measure of profitability of the core business operations of commercial banks in Ethiopia, with the conventional concept that the core business operations profitability depends on the interest income, interest expense, and efficient management of the respective interest earning assets. Moreover, with the concept that profitability of banks also depends on asset size, growth**,** and collection and payment of interest, the bank's asset size and growth as well as spread was taken as control variable.

Fig 2.1conceptual frame work



CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

Introduction

The previous chapter presented the literature review along with the knowledge gap which this study intends to address. The purpose of this chapter is to discuss the methods adopted throughout the study to accomplish the research objectives. The chapter was organized as follows: The first section 3.1 presented introduction, 3.2 presented the research design examine the impact of capital structure on profitability, while section 3.3 is about the data source and collection methods. The sampling design and data analysis techniques presented in section 3.4 and 3.5 respectively. Furthermore, section 3.6 stated about model specification and variable description.

3.1 Research Design

As noted in Creswell (2003), in an investigative study there are three familiar types of research approaches to business and social research namely, quantitative, qualitative and mixed methods approach. Considering the research problem and objective along with the philosophy of the different research approaches, the quantitative nature of the data collect, quantitative research approach was found to be appropriate for this study. Hence, to meet the objectives of this study, explanatory research design was served. Because of the explanatory research design is type of design to show impact of capital structure on profitability of commercial banks in Ethiopia to analyse and examine impact of variables on profitability. Besides, this study was adopted quantitative research approach to examine a state objective because quantitative research is a systematic and scientific investigation of quantitative properties and phenomena and their relationships (Abiy, 2009).

Panel data of nine commercial banks for 10 years (2007 to 2016) was used. This is because of that panel data has the advantage of giving more informative data as it consists of both the cross-sectional information, which captures individual variability, and the time-series information, that captures dynamic natures of the data.

3.2 Source of data and collection methods

Given the research design, secondary data was used to meet the objectives of the study. According to Stewart and Kamins (1993) cited in Li Yuqi (2007), secondary data have its own advantages compared to primary data, because of nature of variables and the feasibility to conduct longitudinal studies and the permanence of data. That is, secondary data generally provide a source of data that is both permanent and available in a form that can be check relatively easily by others and increases the dependability of the data, hence ensure data quality.

As a result, the data for the bank's capital structure and profitability indicator variables was obtained from audited financial statements of the respective banks. Thus, the data was collected from National Bank of Ethiopia (NBE) and from the respective commercial banks. In order to avoid the risk of distortion in the quality of data, the data from the audited financial statements particularly balance sheet and income statement was used to conduct this research. The study included nine commercial banks composed of one state owned and eight private banks. Accordingly, this study used panel data of nine commercial banks for (2007 to 2016 resulted in 90 observations.

3.3 Sampling design

The population of the study include all commercial banks registered by National Bank of Ethiopia (NBE). Currently, as per NBE (2017) annual report the major financial institutions operating in Ethiopia are banks, insurance companies and micro-finance institutions. The numbers of banks operating in the country are 18, of which 16 are private banks, and the remaining 2 are state-owned from these 18 banks only 17 banks are Commercial Banks. This excludes the Development Bank of Ethiopia which provides banking service to the selected government priority sectors. In line with balance panel data approach, to meet the desire objective of this study and to make generalization from sample to population, the researcher used maximum combination of years and number of banks and achieve the maximum number of observations through purposive sampling technique by using personal judgement banks having ten year and more than ten operation included in the sample and availability of data for ten year operation banks namely, commercial bank of Ethiopia (CBE),cooperative bank of oromiya (COB,) Dashen bank (DB), Awash international bank (AIB), Bank of

Abyssinia (BOA), Wegagen bank (WB),lion international bank(LIB),united bank(UB)and nib international bank(NIB)for the period of 2007 to 2016 (in which audited financial statements was available) to the National Bank of Ethiopia (NBE).

3.4 Data analysis method.

This study used two data analysis methods. These were 1, Using statistical package e-view8 version software and the collected panel data was analysed by using descriptive statistics and multiple regressions. In the analysis of the descriptive statistics, the mean, standard deviation, maximum and minimum values were used to analyse the trends of the data. Finally, the Hausman specification test wasused to choose the appropriate model for this study between the random effect (RE) and fixed effect (E) model. Thus, based on the result of this test, the fixed effects model was applied to this study. Therefore, the multiple regression result of the fixed effect model wasused to analyzethe impact of capital structure on profitability of commercial banks of Ethiopia, and to examine the relationship between the variables used in this study.

3.5Variables Description AND Measurements

3.5.1 Variables description.

This study used explanatory variables such as total debt to asset, deposit to asset, loan to deposit, spread, growth and asset size while the dependent variable is net interest margin. The variables descriptions are state below.

3.5.1.1 Dependent Variable

Net interest margin (NIM)

Net Interest Margin (NIM) was used as a dependent variable and it measured as the difference between the interest income and interest expense divide by total interest earning assets. Okoth (2013) states that net interest margin reflects the cost of banks inter mediation services and the efficiency of the bank. And hence, the higher the net interest margin, the higher the profit earned by the bank and the more stable the bank is. Therefore, it measures the profitability core business operations of banks.

The fact that the profitability of core business operation of banks will be directly and reasonably measure by net interest margin, this study examined profitability of banks core business operation using net interest margin (NIM) as a dependent variable. Earlier studies also employed net interest margin (NIM) as profitability measure. Some of them are Taani (2013), and Okoth (2013)

The formula used to calculate the NIM was;

$$NIM = \frac{\text{Interest Income on Interest Expense}}{\text{Interest Earning Assets}}$$

3.5.1.2 Independent Variables

Total Debt to Asset (TDA)

The total debt to asset variable used to represent the proportion of banks asset/operation financed by debt, hence used as one measure of the capital structure of banks. Goyal (2013), and Arkhavien (1997) found statistically significant negative relationship between profitability and leverage. This is also consistent with the pecking order theory of capital structure. Hence taking into account the earlier empirical studies and the nature of financing structure of banking industry in Ethiopia, negative relationship with profitability was expected. For the purpose of this study it was calculated as:

$$TDA = \frac{\text{Total Debt}}{\text{Total Asset}}$$

H1: There is no significant relationship between capital structures proxied by Total Debt to Asset and profitability measured by (NIM)

Deposit to asset (DPA)

As the major source of external finance is deposits, deposit to asset ratio used as an independent variable to examine the impact of deposit on profitability of commercial banks in Ethiopia. Since the total debt of banks composed of deposit and non-deposit liabilities, this variable intends to show the impact deposit finances and hence the non-deposit financing decision on profitability. Abbadi& Abu-Rub (2012) found Positive relationship between deposit to asset and profitability. Based on the nature of banks operation and empirical evidences, in this study a positive relationship between deposit to asset ratio and profitability of banks was expected. The formula used to calculate this variable is;

$$DPA = \frac{\text{Total Deposit}}{\text{Total Asset}}$$

H2: There is no significant relationship between capital structure proxied by Deposit to Asset and profitability measured by (NIM).

Loan to Deposit (LD)

The Loan to deposit (LD) ratio served as bank liquidity measure. It measures the funds that banks utilized into loans from the collect deposits in the period under study. It validates the association between loans and deposits. Furthermore, as it indicates in Makri (2014), it provides a measure of income source and the liquidity of bank asset ties to loan. Eltabakh, Ngamkroeckjoti, &Siad (2014) found statistically significant positive relationship between profitability and loan to deposit ratio. Since, the major source of interest income comes from loans and with reference to empirical studies, in this study it will expect to have positive relation with profitability of core business operation of banks.

Loan to deposit was calculated as:

$$LD = \frac{\text{Total loan}}{\text{Deposit}}$$

H3: There is no significant relationship between Loan to Deposit and profitability commercial banks (NIM).

Spread (SPR)

The purpose of this variable in this study was served as control variable. Khumaloand, Olalekan, &Okurut (2011) used the definition of spread as the difference between income received on loans (divide by total loans) and interest paid on deposits (divide by total deposits). The empirical studies of Vickery (2011) and Irungu (2013) revealed a positive relationship between spread and net interest margin or profitability. Due to the fact that the profitability of core operations of banks depends on interest income and expense and in line with empirical evidences, in this study a positive relationship between spread and profitability was expected. The formula used to calculate was:

$$\text{Spread} = \frac{\text{Interest Income}}{\text{Loan \& Advance}} - \frac{\text{Interest Paid}}{\text{Deposit}}$$

H4: There is no significant relationship between Spread and profitability of commercial banks (NIM).

Growth (AGR)

This variable included in the study served as a control variable. Percentage change in banks asset serves as a proxy for growth. Assets growth was used by many scholars in their studies, for example Goyal (2013) used asset growth as a growth opportunity of banks and found a positive relationship with profitability.

Ideally, trends of positive relationship with net interest margin expect. A positive relationship to a large extent may imply operational efficiency in the banking sector of Ethiopia. A negative relationship between the dependent variables and growth however is an indication that Commercial banks in the country do not really efficient in utilizing the growth opportunity in their core business operation. In this study a positive relationship is expected between the dependent variables NIM and Asset growth (AGR). And for the purpose of this research it was calculated by the following formula.

Assets growth= (assets of current year-assets of previous year)/assets of current year

H5: There is no significant relationship between growth and profitability of core business operations of commercial banks in Ethiopia.

Asset Size (Size)

Asset size of banks was considered in this study as a control variable. In addition to its role as a control variable, size was introduced to determine whether economies or diseconomies of scale existed in the banking sector of Ethiopia.

H6: There is no significant relationship between Asset size and profitability of core business operations of commercial banks in Ethiopia.

Table 3.1: Summary of variables that will be used in the Study and their expected sign/impact and associations and measurements

Category	Variables	Measurement / Ratios used	Expected sign/ impact of Independent on the dependent Variable
Dependent Variable	Net Interest Margin (NIM)	Net Interest Income / Interest Earning Assets	
Independent Variables	Debt to Asset	Total Debt/Total Asset	-
	Deposit to asset	Total deposit/Total Asset	+
	Loan to Deposit	Loan/Total Deposit	+
	Spread	(Interest Income /Loan) - (Interest Expense / Deposit)	+
	Growth	% Change in Asset	+
	Size	Book Value of Total Asset	+

3.5.2 Model specification

It is clearly indicated in the previous sections panel data regression model was adopted for this study. Panel data was generated using both time series and cross-sectional data from the audited financial statements of the banks. It also ideally used because it helps in the identification of effects that cannot be easily point out using purely cross- section or time series data, and other important features. This study used explanatory variables such as debt to asset, deposit to asset, loan to deposit, spread, growth and asset size while the dependent variable was net interest margin.

The modification was modified to include net interest margin (NIM) as a dependent variable, explanatory variables such as Deposit to asset (DPA) as a second measure of capital structure, loan to deposit (LD) as a measure of liquidity tide to loan, and spread as a control variable.

The general model;

$Y_{it} = \alpha + \beta X_{it} + \mu_{it}$ Where,

Y_{it} = is the dependent variable.

B0 = is the intercept.

X_{it} = is the independent variable.

μ_{it} = are the error terms.

i = is the number of firms and

t = is the number of time periods.

The subscript i representing the cross-sectional dimension and t denote the time-series dimension. Based on the above general model the effect of capital structure on profitability of core business operation of commercial banks was evaluated by using the model outlined below;

$NIM_{it} = \beta 0_{it} + \beta 1 TDA_{it} + \beta 2\ DPA_{it} + \beta 3\ LD_{it} + \beta 4\ Log\ (SPR)_{it} + \beta 5\ AGR_{it} + B6\ Log\ (SIZE)_{it} + \mu_{it}$ Where,

NIM_{it} = Net Interest Margin for bank i in year t

TDA_{it} = Total Debt to Asset ratio for bank i in year t

DPA_{it} = Total Deposit to Asset ratio for bank i in year t

LD_{it} = Loan to Deposit ratio for bank i in year t

$Log\ (SPR)_{it}$ = Log of Spread for bank i in year t

AGR_{it} = Asset Growth for bank i in year t

$Log\ (SIZE)_{it}$ = Log of Asset Size for bank i in year t

CHAPTER FOUR

ANALYSIS AND PRESENTATION

4. INTRODUCTION

The previous chapter presented the research methodology applied to meet the objective of the study. This chapter presents the results and analysis of the findings as well as discussion of results. The chapter is organized in to four sections. Section 4.1 presents summary of statistics. Then Section 4.2 presents the Classical Linear Regression Model assumptions tests 4.3 results of regression analysis respectively. Finally, section 4.4 presented the summary of findings.

4.1 Summary of descriptive statistics

As clearly mentioned in earlier chapters, in this study a sample of 9 commercial banks for 10year (2007 – 2016) were considered. The audited financial statements, particularly balance sheet and income statements collected directly from the respective banks and National Banks of Ethiopia (NBE). In this study a profitability measure of the core business operation of banks, Net Interest Margin (NIM) was taken as a dependent variable. Whereas, the Total Debt to Asset (TDA), Deposit to Asset, Loan to Deposit, Spread, Growth, and Asset size were used as independent variables

Table 4.1 below provides a summary of the descriptive statistics of the dependent and independent variables for eight commercial banks of Ethiopia for the period of 10 years from year 2007-2016 with a total of 90 observations.

	NIM	DBA	DPA	LD	BS	SPREAD	GROWTH
Mean	0.040170	0.338201	0.702175	1.942923	4.239839	0.013680	0.241726
Median	0.038400	0.340964	0.748336	0.470350	4.086339	0.016700	0.212200
Maximum	0.095000	0.387141	0.799786	5.660790	5.057913	0.021200	0.540230
Minimum	0.017600	0.277778	0.192609	0.300000	3.530968	0.000000	0.022402
Std. Dev.	0.020607	0.033867	0.172288	2.308091	0.584595	0.007489	0.132073
Observations	90	90	90	90	90	90	90

Source: Financial statements of sample banks and own computation in E-view

As it is presented in the table, it includes the mean, standard deviation, number of observations, minimum and maximum for the dependent and independent variables of the model. It shows the average indicators of variables computed from the financial statements.

As shown in chapter three, profitability of core business operations of commercial banks was measured by Net interest margin (NIM) which in turn calculated as net interest income divided by interest earning assets. The mean of Net Interest Margin (NIM) was 4% and standard deviation 2%. This means commercial banks in Ethiopia, under the period of study, earned on average 4% net interest margin from their investment in interest earning assets. This also means that on average, for each one-birr investment in the interest earning asset of commercial banks there was 0.04 cent return in the form of net interest income. The highest NIM for a bank in a particular year was 9% and in the same way the minimum ratio for a bank in a year was 1%. Regarding the standard deviation, it means that the value of net interest margin can deviate from its mean to both sides by 1%.

The leverage/capital structure was represented by debt ratio (total debt divided by total asset) and then deposit to asset ratio also used as a second measure of capital structure of banks to examine the impact of deposit and non-deposit liability on profitability of banks. The mean of debt ratio of the sampled banks in the study Period was 48%. It reveals that debt represents nearly 33% of the capital of commercial banks in Ethiopia. The highest debt ratio for a bank in a particular year was 38% and in the same way the minimum ratio for a bank in a year was 27.7%. The value of debt to asset ratio can deviate from its mean to both sides by 0.3%. From the summary of statistics, it was observed that 48% of the total capital of commercial banks in Ethiopia in the period under study was made up of debt. Of this, 70% constitute deposit and the remaining was non-deposit liabilities. This has reaffirmed the fact that banks are highly levered institutions.

DEPOSIT TO ASSET; the table above showed that the mean of deposit to asset ratio of the sample banks in the study period was 70%. It reveals that total deposit represents on average nearly 17% of assets of commercial banks in Ethiopia. The highest deposit

to asset ratio for a bank in a particular year was 79% and in the same way the minimum ratio for a bank in a year was 30%. The value of deposit to asset ratio can deviate from its mean to both sides by 1.7%.

LOAN TO DEPOSIT RATIO; The descriptive statistics showed that the loan to deposit ratio was used as a proxy for bank liquidity tide to loan. The mean of loan to deposit ratio of the sample banks in the study period was 19%. It reveals that loan represents on average nearly 19% of deposit of commercial banks in Ethiopia. The highest loan to deposit ratio for a bank in a particular year was 56% and this reveals that banks loan advances to customers from deposit and non-deposit sources of finance. In the same way the minimum ratio for a bank in a year was 30%. The value of loan to deposit ratio can deviate from its mean to both sides by 23%.

GROWTH; The descriptive statistics showed that the average value of the growth variable which represented by percentage change in asset was 24%. This implies that on average the commercial banks' asset increased by 24 % over the study period. The maximum value of growth for the study period was 54% and the minimum value was 20%. The value of asset growth can deviate from its mean to both sides by 13%.

Bank size; The implication is that as bank size increases, Profitability increases as well. Nevertheless, many other studies suggested that little cost saving can be achieved by increasing the size of banks. Similarly, Berger (1987) contended that ultimately very large banks could face scale inefficiencies. For the purpose of this study, bank size has been taken as the natural logarithm of the book value of total assets of the banks. The use of logarithm enables to get the real total assets of the banks due to its capability to standardize values thus bringing them on the same platform for a more efficient analysis to be done. Likewise, the mean of the firms' size which was represented by the book value of total assets was 42.3%with a standard deviation of58%. And this highest asset size was observed in the balance sheet of Commercial Bank of Ethiopia (CBE) 50.5%, the minimum asset size was observed in the balance sheet of 35.5%.

SPREAD; besides, summary of test statistic shows that the mean of spread was 1.3% with the standard deviation of 0%. Moreover, the study sample spread was ranged in between0% to 2%.

4.2 Tests for the Classical Linear Regression Model (CLRM) assumptions

This section presents the test for the assumptions of classical linear regression model (CLRM). That is, the error has zero mean, heteroscedasticity, autocorrelation, normality and multicollinearity.

4.2.1 Assumption one: the errors have zero mean (E (ε) = 0)

The regression model used in this study included a constant term. As clearly stated in Brooks (2008), if a constant term is included in the regression equation, this assumption will not be violated. Hence, this assumption was not violated in the study.

4.2.2 Assumption two: homoscedasticity (variance of the errors is constant (Vary (UT) = σ2 < ∞)

According to this assumption, if the errors do not have a constant variance, it is said to be the assumption of homoscedasticity has been violated. The violation of this assumption is called heteroscedasticity. In this study heteroscedasticity white test was used to test for existence of heteroscedasticity across the range of explanatory variables.

TABLE 4.2

Heteroscedasticity Test: White test

F-statistic	1.251137	Prob. F(21,65)	0.2421
Obs*R-squared	25.04361	Prob. Chi-Square(21)	0.2453
Scaled explained SS	352.893	Prob. Chi-Square(21)	0.0000

Source: Financial statements of sample banks and own computation

As it is indicated in in table 4.2 the result shows that the F-, X^2, and scaled explained SS versions of the test statistic give the same conclusion that the p-values were greater than 0.05. Therefore, the presence of heteroscedasticity was confirmed resulted in presence of homoschedacity.

4.2.3 Assumption three: covariance between the error terms over time is zero (cov (ut, uj) = 0)

This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). If the errors are correlated with one another, it would be stated that they are auto correlated.

According to Brooks (2008), the null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value; the null hypothesis is rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value; the null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper and 4 minus the upper limits; the null hypothesis is neither rejected nor not rejected if DW is between the lower and the upper limits, and between 4 minus the upper and 4 minus the lower limits.

The DW test statistic value of the regression result of this study was 3.608458

There are 90observations in the regression and 6 repressors excluding the intercept. As per the DW statistics significance table, at 5% significance level the relevant critical values for the test were dL =1.383and dU=1.661 and the related calculated figures of 4 − dU = 2.339 and 4 − dL =2.617the test statistic (3.608458) falls between the upper (dU = and 4 minus the upper limits (4 − dU =2.339). Therefore, the null hypothesis is rejected and significant residual autocorrelation problem was presumed. It is better to show it by using graph as follows

H0: ρ =0 (no autocorrelation)

H1: ρ ≠0 (autocorrelation)

DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation

can neither be rejected nor not rejected! The rejection, non-rejection, and inconclusive regions are shown on the number line

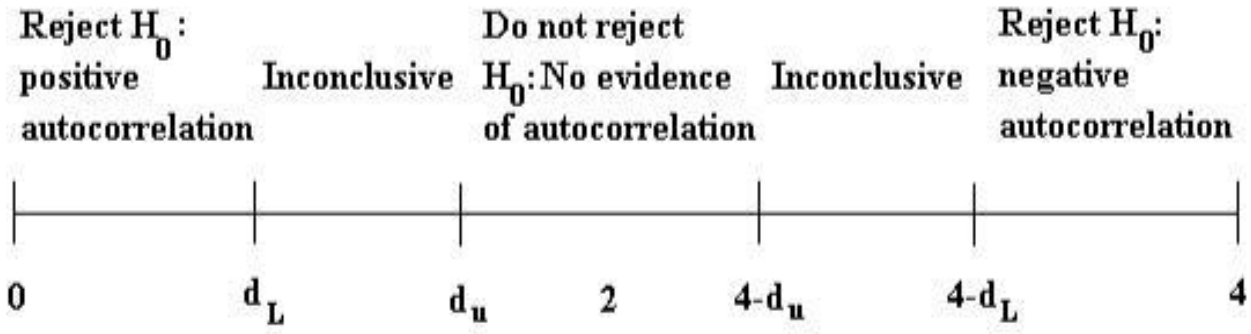


Figure 4.1 Durbin wat test

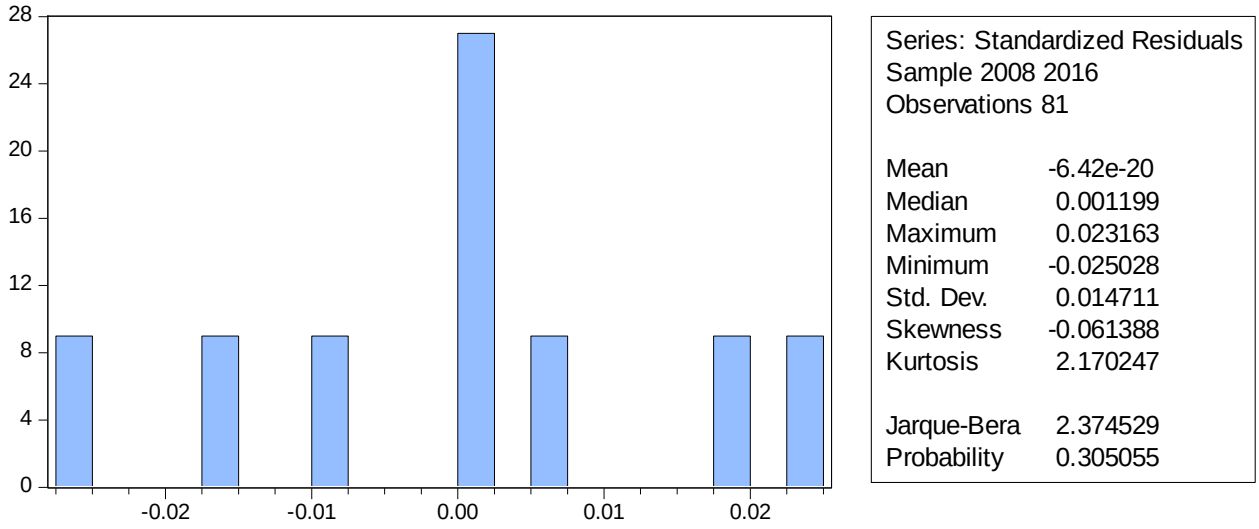
test	Test statistics
Dw result	3.68045

The DW value of lies negative auto correlation region reject null hypothesis region autocorrelation region, but actually in the reject area where the null hypothesis of autocorrelation still be rejected.

4.2.4 Assumption four: normality (errors are normally distributed (ut ~ N (0, σ2))

Brooks (2008) stated also that if the residuals are normally distributed, the histogram should be bell-shaped and theJarque-bera statistic of would not be significant. That is, the p-value given at the bottom of the normality test screen should be greater than 0.05 to not reject the null hypothesis normality at the 5% significant level

Figure 4.2Normality Test



Source: Financial statements of sample banks and own computation

From the above **figure 4.2** we can conclude that there is no problem of normality. That is, the coefficient of kurtosis was close to 3, and the Jarque-bera statistic has a P-value of 0.305055 implying that the data were consistent with a normal distribution assumption. Furthermore, it indicates that the inferences made about the population parameters from the sample parameters tend to be valid.

4.2.5 Assumption five: Multicollinearity Test

Multicollinearity refers to the situation where there is either an exact or approximately exact linear relationship among the explanatory variable.

The test for Multicollinearity helps to identify the correlation between explanatory variables and to avoid double effects of the independent variables. When the explanatory variables are highly correlated with each other, there exists Multicollinearity problem (Brooks, 2008). Though, there is no consistent argument on the level of correlation that causes Multicollinearity, (Hair etal) 2006 argues that correlation coefficient below 0.7 may not cause serious Multicollinearity problems. Malhotra (2007) stated that Multicollinearity problem exists when the correlation coefficient among variables is greater than 0.7. On the other hand, according to Guajarati (2004), if the correlation coefficient is higher than 0.7, it is considered as the model consists of serious multicollinearity problem.

The result of the final test for multicollinearity of this study is presented in
Table 4.3 Correlation Matrix between independent variables

	NIM	DBA	DPA	LD	BS	SPREAD	GROWTH
NIM	1.000000						
DBA	0.147085	1.000000					
DPA	0.217250	0.260951	1.000000				
LD	-0.20523	0.004066	0.337061	1.000000			
BS	0.055244	-0.02313	-0.46597	-0.66242	1.000000		
SPREAD	0.298333	0.157430	0.321140	0.485491	-0.09799	1.000000	
GROWTH	0.312414	0.692200	0.159802	-0.4517	0.500619	-0.0676	1.000000

Source: Financial statements of sample banks and own computation

Table 4.3, the correlation matrix between independent variables was the method used in this study to test the existence of multicollinearity problem. Since, all correlation results are below 0.7. As a result for this study result is above 0.7 leads to indicate that multicollinearity was not potential problem for this study.

As it is clearly stated above, all assumption tests results indicated that the employed model for this study was not sensitive to the problems of violation of the CLRM assumption except multicollinearity and autocorrelation.

4.3 Correlation Analysis

The purpose of correlation matrix in this particular study was to show the linear association between the dependent and independent variables. As noted in Brooks (2008), correlation between two variables measures the degree of linear association between them. Values of the correlation coefficient are always range between positive one and negative one.

A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables.

Table 4.4 below presents the correlation coefficients for the variables used in the capital structure of commercial banks in Ethiopia. As exhibited in table 4.4, almost all the variables correlated with capital structure of commercial banks are with the lowest correlation coefficient.

	NIM	DBA	DPA	LD	BS	SPREAD	GROWTH
NIM	1.000000						
DBA	0.147085	1.000000					
DPA	0.217250	0.260951	1.000000				
LD	-0.20523	0.004066	0.337061	1.000000			
BS	0.055244	-0.02313	-0.46597	-0.66242	1.000000		
SPREAD	0.298333	0.157430	0.321140	0.485491	-0.09799	1.000000	
GROWTH	0.712414	0.692200	0.159802	-0.4517	0.500619	-0.0676	1.000000

Eview result

This relationship suggests initial picture as to the nature of the relationship between explanatory variables and capital structure of commercial banks in Ethiopia. As the correlation matrix indicates, audit bank growth was the most strong dominant determinant of capital structure of commercial structure of commercial banks in Ethiopia, which is reflected in the table by the Table 4.4 above also reported all the variables have a very weak correlation with the explanatory variables. The coefficient of correlation between debt to asset, deposit to asset, loan to deposit, bank size, and spread respectively were 0.147085, 0.217250, 0.20523, 0.05524 and 0.298333.This shows that weak and negative relationship.

4.4 Results of the regression analysis

According to Gujarati (2004), if the number of time series data is large and the number of cross-sectional units is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model

In addition to Gujarati (2004), Brooks (2008), states in financial research, there are two major classes of panel estimator approaches that can be employed. Namely, the fixed effects model and random effects model. In order to select the appropriate model which, provide consistent estimates for this study, Hausman test was employed. The Hausman specification test which suggests the fixed effects model was better than

random effects model as cross section is less than longitudinal in the observation which imply that the random effects model should be rejected and thus, the analysis is based on the fixed effects estimates.

4.5Fixed effect model estimates.

The empirical model used in this study to examine the significant impact of NIM ON the commercial banks in Ethiopia.

NIM it = β0 it + β1TDA it +β2 DPA it + β3 LD it +β4 Log (SPR) it + β5 AGR it +β6 Log (SIZE) it +μ it

The following table presents the regression result of the impact of independent variables on NIM of commercial banks in Ethiopia from the following fixed regression model the empirical regression equation is look like this.

NIM (it)=0.264913(it)-0.385032(DBA it)-0.028095(DPAit)-0.005770(LD it)+ 0.032451(BS it)+ 2.552050(SPREAD it)+ 0.150598β6(GROWTH it)+μ it

Table 4.5 fixed effect model result

Dependent Variable: NIM
Method: Panel Least Squares
Date: 05/28/19 Time: 17:03
Sample (adjusted): 2007 2016
Periods included: 10
Cross-sections included: 9
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.264913	0.055588	4.765638	0.0000
DBA	-0.385032	0.106953	-3.600026	0.0006
DPA	-0.028095	0.015809	-1.777137	0.0802
LD	-0.005770	0.001272	-4.537032	0.0000
BS	0.032451	0.006869	-4.724409	0.0000
SPREAD	2.552050	0.405590	6.292200	0.0000
GROWTH	0.150598	0.034644	4.346966	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.486684	Mean dependent var	0.042411
Adjusted R-squared	0.377799		
S.E. of regression	0.016196		
Sum squared resid	0.017312		
Log likelihood	227.3230		
F-statistic	4.469702	Durbin-Watson stat	3.608458
Prob(F-statistic)	0.000015		

*** Significant at 1% and ** significant at 5%**

Source: Financial statements of sample banks and own computation

The fixed effect result in table above4.4 indicates that capital structure as measured by total debt to asset was statistically significant (p- value = 0.0006) at 5% level and had negative relation with profitability. Whereas, deposit to asset was statistically insignificant (p-value = 0.08202) at 1% level and had negative relation with profitability, net interest margin.

Similarly, liquidity measured by loan to deposit was statistically significant (p-value = 0.000) at 1% level and had negative relation with profitability, net interest margin. Likewise, spread was also strongly statistically significant (p-value = 0.000) at 1% level and had positive relation with profitability, net interest margin.

Besides, the fixed effect table above reveals that banks size as measured by logarithm of book value total asset strongly statistically significant (p- value = 0.0000) at 1% level and had positive relation with profitability. Growth had also strongly positive and statistically insignificant relationship with profitability with a p-value of (0.0000).

Moreover, the result shows that the adjusted R square was 0.377779 which indicates that about 37% of the variability in profitability is explained by the selected explanatory variables (Total Debt to Asset, Deposit to asset, (Loan to deposit), Spread, Growth, and Size). In addition, the Prob (F-statistic) 0.000000 indicates that the explanatory variables jointly have significant impact on profitability of core business operations of commercial banks in Ethiopia.

4.5 Summary of findings

Total Debt to Asset Ratio:

The result of fixed effect model table 4.4 indicates that capital structure as measured by total debt to asset had negative relationship with profitability, and statistically significant (p- value = 0.0006) at 5% level, and the result was in accordance with the expected sign. As a result, the null hypothesis H1: which states there is negative and significant relationship between capital structure peroxide by Total Debt to Asset and profitability of core business operations of commercial banks in Ethiopia was accepted. This implies that every 1 unit (birr) change (increase or decrease) in bank's capital structure (Debt ratio) keeping the other thing constant has a resultant change of 5 cents (Coeff. = -0.385032) on the profitability in the opposite direction. This result also shows that debt financing has a negative impact on profitability of the Ethiopian banking industry. Besides, the result revealed the suggestions that even though, profitable banks may have better access to external financing, the need for debt finance may possibly be lower, if new investments can be financed from accumulated reserves. The possible reason for this result could be that the cost (interest expense) associated debt financing through non-deposit sources are expensive in the context of Ethiopia banking business operations/ environment.

The result of this study is consistent with the pecking order theory that suggests profitable firms prefer internal financing to external financing and hence profitability is expected to have negative relation with leverage (Myers &Majluf, 1984). Beside, a negative relationship between capital structure/leverage and profitability was observed in the previous empirical studies, for example, Weldemikael (2012), Rajan&Zingales (1995), Opoku et al. (2013), Shubita& alsawalhah (2012), Amidu (2007), and Taani (2013) were some of them.

Deposit to Asset ratio:

The result of fixed effect model table 4.4 indicated that Deposit to asset had negative relationship with profitability with statistically significant (p-value = 0.0820) at 1% level. And it was not in accordance with the expected sign. As a result, the null hypothesis H2: which states there is positive and significant relationship between capital structure proxied by Deposit to Asset and profitability of core business operations of commercial banks in Ethiopia was rejected. This implies that every 1 unit

(birr) change (increase or decrease) in bank's deposit to asset ratio keeping the other thing constant has a resultant change of 2 cents (Coeff. = -0.028095) on the profitability in the opposite direction. This result also shows that financing with deposit have a negative impact on profitability of Ethiopian banking industry.

Loan to Deposit ratio:

The result of fixed effect model table 4.4 indicated that liquidity as measured by loan to deposit relationship with profitability (net interest margin) and statistically significant (p-value = 0.0000) at 1% level, and it was not in accordance with the expected sign. As a result, the null hypothesis H3: which states there is significant relationship between Loan to Deposit and profitability of core business operations of commercial banks in Ethiopia was rejected. This implies that every 1 unit (birr) change (increase or decrease) in bank's loan to deposit ratio keeping the other thing constant has a resultant change of 5 cents (Coeff.= -0.005770) on the profitability (Net Interest Margin) in the opposite direction. This result also shows that an increase in amount of loan advances to customers from deposit financing has a negative impact on profitability of Ethiopian banking industry. The possible reason could be that the interest income associated with loan advances financed by deposit sources was greater than the costs or interest paid to depositors. The result was not consistent with previous empirical findings of (Eltabakh et al., 2014).as a result null hypothesis is not accepted.

Spread:

Likewise, the result of fixed effect model table 4.4 indicated that spread had positive relationship with profitability and statistically significant (p-value = 0.000) at 1% level, and it was in accordance with the expected sign. As a result, H4: which states there is positive and significant relationship between Spread and profitability of core business operations of commercial banks in Ethiopia was accepted. This implies that every 1% change (increase or decrease) in bank's spread keeping the other thing constant has a resultant change of 25 cents (Coeff. = 2.5552) on the profitability in the same direction. This result also shows that an increase in the spread has a positive impact on profitability of Ethiopian banking industry. The possible reason could be due to the fact that during the period under study, the interest rates used to pay for depositors were lower than the interest rates applied on the loans and advances. The result was consistent with previous empirical findings of (Vickery, 2011) and Irungu(2013) too.

Size:

The result of fixed effect model table 4.4 reveals that banks size had positive relationship with profitability, and statistically significant (p- value = 0.0000) at 1% level, and it was in accordance with the expected sign. As a result, the null hypothesis was accepted. H6: which states there is significant relationship between growth and profitability of core business operations of commercial banks in Ethiopia. This implies that every 1% change (increase or decrease) in the banks size keeping the other thing constant had a resultant change of 15 cents (Coeff. = 0.15058) on the profitability in the same direction as well as in growth. The results also suggested that the bigger the bank, the more economics of scale and hence more profitable as well. The possible reason is that, larger banks have economics of scale and lower variance of earnings which resulted in profitability. Besides, many previous studies indicated a similarly strong significant positive relationship, for example Goyal (2013), Shubita& alsawalhah (2012), and Arkhavien (1997) were some of them.

Category	independent Variables	Measurement / Ratios used	Expected sign and there significance	empirical result and significance	Dependent variable
Independent Variables	Debt to Asset	Total Debt/Total Asset	Negative and significant	negative and significant	Net interest margin(NIM)
	Deposit to asset	Total Deposit/Total Asset	Positive and significant	negative and insignificant	
	Loan to Deposit	Loan/Total Deposit	Positive and significant	negative and insignificant	
	Spread	(Interest Income /Loan) - (Interest Expense/Deposit)	Positive and significant	positive and significant	Measurement used ratio
	Growth	% Change in Asset	Positive significant	positive and significant	nim= net income on interest expense/income before tax
	Size	Book Value of Total Asset	Positive and significant	positive and significant	

Table 4.6: Comparison of expected sign/impact and actual result

4.6Chapter summary

This chapter discussed the results of the data analysis and the discussions of these results using the appropriate method. Accordingly, the chapter discussed the descriptive statistics, the tests for the Classical Linear Regression Model (CLRM) assumptions, and through the regressions analysis; it illustrates the relationship between dependent and independent variables as well as the impact of capital structure on profitability of banks in Ethiopia. Hence, the result indicates that debt to asset ratio (leverage), deposit to asset ratio, loan to deposit ratio (liquidity), spread, and size were statistically significant factors that impacted the profitability of banks in Ethiopia. The subsequent chapter presents conclusions and recommendations of the study.

Chapter 5: Conclusion and recommendation

The earlier chapter presented the results and discussion, whereas this chapter deals with the conclusions and recommendations based on the findings of the study. Accordingly, this chapter is organized into two sub-sections. Section 5.1 presents the conclusions and section 5.2 presents the recommendations in line with findings of the study.

5.1 Conclusion

The choice of capital structure is one of the most important strategic financial decisions of firms. Since the seminal work of Modigliani and Miller (1958), the issue of capital structure and profitability or the value of a firm has been debatable in the field of corporate finance. The basic question is whether there exists an optimal capital structure that optimizes profitability and hence maximizes the value of a firm. Extensive research attempted to identify factors affecting profitability and capital structure as well as the impact of capital structure on profitability of firms. However, the findings of prior empirical studies have provided varying and in some cases contradicting evidence related to the impact of capital structure on profitability. Furthermore, the majority of these studies have been conducted in developed countries that have many institutional similarities. In addition, the existing studies in Ethiopia were not emphasized on the impact of capital structure on profitability of Commercial banks in the country and moreover, didn't taken into account the important variables which have great impact on profitability of core business of the banking industry.

In light of the above, the main objective of this study was to examine the impact of capital structure on profitability of core business operation of commercial banks in Ethiopia, and the relationship between leverage and profitability of commercial banks in Ethiopian. To achieve the intended objectives, the study used quantitative approaches panel data analysis methodology. The panel data were collected from audited financial statements particularly balance sheets and income statements of a

sample of eight banks over the time period from 2007-2016. The collected data were analysed by employing a fixed effect model using statistical package 'EVIEW 8 software'.

In order to conduct the empirical analysis, one dependent variable and six independent variables were selected from prominent previous research works on the impact of capital structure on profitability and by taking in to account the nature of banks operation. Net interest margin was taken as dependent variable, while the independent variables were debt to asset ratio, deposit to asset ratio, loan to deposit ratio, spread, growth and size.

It was observed that 30% of the total capital of commercial banks in Ethiopia in the period under study was made up of debt. Of this, 70% constitute deposit on average and the remaining was non-deposit liabilities. This has reaffirmed the fact that banks are highly leveraged institutions.

The results of the fixed effect estimation model showed the existence of the following relationship between profitability and six independent variables.

Capital structure/Leverage as measured by debt to asset ratio had statistically significant negative relationship with profitability, which was in line with prior expectation. This result also supports the pecking order theory and prefers using internal finance before raising debt or equity. On the other hand, deposit to asset ratio had statistically insignificant negative relationship with profitability, which was not also in line with prior expectation. Similarly, liquidity (loan to deposit) had a negative and statistically insignificant relationship with profitability, which was not also in line the expected sign. Furthermore, the effect of control variables on profitability of banks in this study, the result shows that as there was positive and statistically significant relationship between spread and profitability, which is in line with prior expectation Besides, the results of the study indicated that bank size had statistically significant positive relationship with profitability, which was consistent with prior empirical evidences and the expected sign. The result also implies that the bigger the bank, the more economics of scale and hence more profitability. However, Growth had statistically insignificant relationship with profitability of core business operations of commercial banks.

In conclusion, the finding of the study suggests that capital structure had significant impact on profitability of core business operations of commercial banks. And implies managers need to consider this impact in their financing or capital structure decision.

5.2 Recommendations

Based on the findings obtained from the results, the following recommendations were made. In line with the results of this study banks management should pay greater attention to those significant variables in determining their optimal capital structure and optimize level of profitability of their core business operations and hence, wealth of shareholders.

The managements of banks should also place greater emphasis on rising equity capital through retain earnings and /or issuing shares of stocks in order to obtain sufficient capital in financing their core business operations and to expand their branch network which in turn creates greater market share and profitability. And hence, advised to reduce non-deposit source of debt financing.

In addition, taking in to account the effect of equity capital on profitability and stability of banks in the country, the policy maker, National Bank of Ethiopia also recommended reconsidering to raise the minimum capital requirement for banks. This also supported due to the fact that, while Ethiopia's new minimum capital requirement is higher than that of East African neighbours such as Kenya, Tanzania, and Uganda, it is lower than the minimum capital requirement for banks in Ghana, Zambia (foreign banks), and Nigeria (Ecobank, 2014)

Moreover, the management of banks should give due attention on deposit mobilization strategies so that to mobilize more fund in financing its core business operations and assets.

Furthermore, banks management should give due consideration to manage their debts in a way that reduce its negative impact on profitability of core business operations, and increase loan advances keeping the profitability of their loan portfolio in line with prescribed objectives and hence generate more interest income from loan advances.

Besides, the commercial banks also recommended developing strategies that will increase spread without affecting their competitive base in the banking business industry. Similarly, increase bank size and manage efficiently taking in to account the economics of scale benefit of bank size.

Finally, this study examined the impact of capital structure on profitability of core business operations of banks in Ethiopia using net interest margin as dependent variable and some of the measures of capital structure as independent variables. Thus, future researcher may address limitations by including internal variables such as equity to asset ratio and debt to equity ratio as well as external variable like as control variables, sales growth, GDP growth, inflation, operational efficiency, and spread, etc. So that to demonstrate the impact of other measure of capital structure and capital adequacy as well as external variables on the profitability of banks. Furthermore, future researcher may assess the impact of capital structure on the overall performance of banking industry and other sectors of the economy too.

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APPENDIXES

Appendix I

Table 4.5 fixed effect model regression result

Dependent Variable: NIM
Method: Panel Least Squares
Date: 05/28/19 Time: 17:03
Sample (adjusted): 2007 2016
Periods included: 10
Cross-sections included: 9
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.264913	0.055588	4.765638	0.0000
DBA	-0.385032	0.106953	-3.600026	0.0006
DPA	-0.028095	0.015809	-1.777137	0.0802
LD	-0.005770	0.001272	-4.537032	0.0000
BS	0.032451	0.006869	-4.724409	0.0000
SPREAD	2.552050	0.405590	6.292200	0.0000
GROWTH	0.150598	0.034644	4.346966	0.0000

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.486684	Mean dependent var	0.042411
Adjusted R-squared	0.377799		
S.E. of regression	0.016196		
Sum squared resid	0.017312		
Log likelihood	227.3230		
F-statistic	4.469702	Durbin-Watson stat	3.608458
Prob(F-statistic)	0.000015		

*** Significant at 1% and ** significant at 5%**

Source: Financial statements of sample banks

Appendix ii panel data

number	bank	year	NIM	DBA	DPA	LD	BS	spread	growth
1	1	2007	0.02	0.3215	0.756466	0.3	4.63805	0	0.2122
2	1	2008	0.03	0.322814	0.74645	0.46	3.702517	0	0.2122
3	1	2009	0.04	0.340964	0.732002	0.4807	3.973636	0.02	0.16016
4	1	2010	0.03	0.317751	0.192609	0.4395	4.870328	0.01	0.17842
5	1	2011	0.0368	0.307172	0.742126	0.4243	5.057913	0.0152	0.2487
6	1	2012	0.0413	0.383719	0.734091	0.5345	5.057	0.0158	0.54023
7	1	2013	0.095	0.353494	0.773125	0.4538	4.199042	0.0176	0.38988
8	1	2014	0.0176	0.352975	0.799786	5.294695	3.530968	0.0176	0.2411
9	1	2015	0.045	0.387141	0.794877	5.380949	3.630422	0.0194	0.211971
10	1	2016	0.046	0.277778	0.750222	5.66079	3.738513	0.0212	0.022402
11	2	2007	0.051	0.646938	0.818312	0.8471	3.79796	00.046.	0.19831
12	2	2008	0.053	0.468643	0.098287	0.81	3.862012	0.046	0.25734
13	2	2009	0.035	0.446032	0.094808	0.6028	3.915927	0.055	0.2826
14	2	2010	0.044	0.464968	0.093153	0.6136	4.005567	0.037	0.14661
15	2	2011	0.047	0.440368	0.090822	0.5458	4.052155	0.042	0.159
16	2	2012	0.035	0.460801	0.110073	0.5756	4.135691	0.04	0.13212
17	2	2013	0.05	0.45503	0.109389	0.5534	4.226034	0.034	0.22937
18	2	2014	0.049	0.448829	0.135598	0.5534	3.583199	0.043	0.10806
19	2	2015	0.053	0.432061	0.132471	0.5311	3.683047	0.045	0.37616
20	2	2016	0.052	0.476086	0.126243	0.5876	3.807738	0.047	0.28234
21	3	2007	0.043	0.541701	0.768534	0.7075	3.900094	0.048	0.41754
22	3	2008	0.044	0.39919	0.123859	0.5467	4.005009	0.039	0.3979
23	3	2009	0.029	0.377218	0.116768	0.5152	4.076895	0.046	0.5405
24	3	2010	0.027	0.379794	0.118313	0.5148	4.17199	0.027	0.18531
25	3	2011	0.027	0.448689	0.134875	0.598	4.301655	0.022	0.24084
26	3	2012	0.04	0.448689	0.135339	0.615	4.377845	0.039	0.12184
27	3	2013	0.045	0.506898	0.126069	0.61	4.471433	0.035	0.40389
28	3	2014	0.048	0.44776	0.129453	0.674	2.424882	0.03	0.2581179
29	3	2015	0.05	0.513832	0.7759	0.677	2.758912	0.032	0.4861676
30	3	2016	0.0289	0.513855	0.771102	0.738	2.978637	0.039	0.193835
31	4	2007	0.618	0.278195	0.746334	0.6148	3.134814	0.0271	0.007519
32	4	2008	0.041	0.313589	0.65331	0.4813	3.257198	0.0618	0.536585
33	4	2009	0.043	0.488445	0.739496	0.6682	3.391464	0.0329	0.397059
34	4	2010	0.05	0.421554	0.746334	0.5739	3.468643	0.0347	0.302053
35	4	2011	0.05	0.368916	0.717367	0.52	3.557868	0.04	0.245575
36	4	2012	0.05	0.388145	0.705238	0.56	3.767823	0.3	0.265936
37	4	2013	0.06	0.442216	0.71584	0.63	3.909515	0.03	0.162814
38	4	2014	0.05	0.426515	0.743703	0.57	3.339054	0.04	0.185718
39	4	2015	0.0574	0.483188	0.780069	0.64	3.511883	0.05	0.383342
40	4	2016	0.065	0.530024	0.799464	0.6795	3.66764	0.04	0.27838
41	5	2007	0.076	0.626661	0.801391	0.915	3.770557	0.03	0.5625
42	5	2008	0.076	0.556923	0.751692	0.761	3.887955	0.04	0.36492
43	5	2009	0.077	0.448409	0.067928	0.595	3.943841	0.041	0.4891
44	5	2010	0.08	0.427069	0.801391	0.553	3.999043	0.044	0.43131
45	5	2011	0.12	0.412374	0.785141	0.54	4.074684	0.05	0.26754

46	5	2012	0.12	0.45408	0.769091	0.605	4.157181	0.07	0.31026
47	5	2013	0.13	0.463319	0.808078	0.584	4.237289	0.08	0.13737
48	5	2014	0.13	0.420715	0.749807	0.569	3.416141	0.08	0.13552
49	5	2015	0.12	0.047157	0.821981	0.581	3.562293	0.08	0.209191
50	5	2016	0.051	0.004877	0.754936	0.655	3.681874	0.08	0.168444
51	6	2007	0.064	0.673188	0.691174	0.967	3.776047	0.042	0.28614
52	6	2008	0.073	0.55726	0.676712	0.8586	3.851992	0.057	0.40012
53	6	2009	0.048	0.440607	0.685667	0.6736	3.91782	0.071	0.31681
54	6	2010	0.06	0.409814	0.691174	0.967	3.961184	0.04	0.24217
55	6	2011	0.06	0.372891	0.725112	0.54	4.031299	0.04	0.19111
56	6	2012	0.08	0.435959	0.725112	0.64	4.122416	0.03	0.1637
57	6	2013	0.07	0.484308	0.72772	0.68	4.199491	0.04	0.10499
58	6	2014	0.08	0.503173	0.737237	0.68	3.781109	0.04	0.180989
59	6	2015	0.09	0.520065	0.737328	0.71	3.893706	0.04	0.215581
60	6	2016	0.0487	0.474529	0.784758	0.7	3.988247	0	0.082261
61	7	2007	0.0492	0.643768	0.785796	0.546685	4.091786	0.0421	0.32886
62	7	2008	0.0.0458	0.546685	0.785796	0.44683	4.166128	0.0444	0.32886
63	7	2009	0.268	0.44683	0.81424	0.399789	4.243535	0.0498	0.32886
64	7	2010	0.0275	0.399789	0.821196	4.655532	4.295505	0.0217	0.32886
65	7	2011	0.0369	0.415686	0.807736	0.415684	4.341676	0.0211	0.32886
66	7	2012	0.0351	0.45373	0.802829	0.45373	4.393819	0.0255	0.32886
67	7	2013	0.058	0.438708	0.80271	0.438708	4.456008	0.052	0.32886
68	7	2014	0.0395	0.429357	0.805081	0.429357	2.627366	0.0281	0.100856
69	7	2015	0.0372	0.457646	0.800121	0.436677	2.83123	0.035	0.113136
70	7	2016	0.048	0.436677	0.796408	0.511702	3.009876	0.0284	0.133419
71	8	2007	0.08	0.556604	0.776018	0.863	3.247482	0.037	0.471698
72	8	2008	0.05	0.469027	0.722714	0.658	3.398114	0.07	0.374631
73	8	2009	0.052	0.57478	0.771261	0.756	3.564784	0.043	0.337243
74	8	2010	0.04	0.39819	0.776018	0.526	3.815511	0.049	0.42138
75	8	2011	0.05	0.314274	0.791683	0.4	3.866346	0.04	0.357387
76	8	2012	0.04	0.314274	0.682826	0.49	4.05926	0.03	0.318714
77	8	2013	0.07	0.04282	0.791683	0.47	4.02637	0.03	0.438599
78	8	2014	0.387651	0.495715	0.741396	0.67	3.541579	0.05	0.110206
79	8	2015	0.08	0.572849	0.64282	0.89	3.615424	1.05	0.358663
80	8	2016	0.046	0.550725	0.790702	0.7	3.7091	0.042	-0.07867
81	9	2007	0.05	0.591954	0.683211	0.7913	3.759063	0.038	*0.5405*
82	9	2008	0.059	0.535273	0.71903	0.7911	3.906389	0.048	*0.18531*
83	9	2009	0.045	0.413793	0.683211	0.5666	3.92153	0.047	*0.24084*
84	9	2010	0.044	0.294753	0.73899	0.6306	4.016783	0.03	*0.12184*
85	9	2011	0.048	0.344622	0.689829	0.4885	4.050866	0.029	*0.40389*
86	9	2012	0.051	0.416796	0.726444	0.6192	4.137081	0.03	*0.03549*

87	9	2013	0.081	0.44112	0.745779	0.6212	4.209224	0.034	*0.24519*
88	9	2014	0.053	0.402713	0.71991	0.5492	4.137074	0.08	0.075479
89	9	2015	0.054	0.442839	0.683939	0.6151	4.209224	0.03	0.180054
90	9	2016	0.029	0.463657	0.937658	0.6775	4.321167	0.027	0.153053

Source: audited financial statements and balance sheet of commercial banks in Ethiopia

Appendix iii: Correlation Matrix

Table 4.3 Correlation Matrix between variables

	NIM	DBA	DPA	LD	BS	SPREAD	GROWTH
NIM	1.000000						
DBA	0.147085	1.000000					
DPA	0.217250	0.260951	1.000000				
LD	-0.20523	0.004066	0.337061	1.000000			
BS	0.055244	-0.02313	-0.46597	-0.66242	1.000000		
SPREAD	0.298333	0.157430	0.321140	0.485491	-0.09799	1.000000	
GROWTH	0.312414	0.692200	0.159802	-0.4517	0.500619	-0.0676	1.000000

Appendix iv; List of commercial banks in Ethiopia 2019

This is a list of banks in Ethiopia.

	Bank Name	Web Site	Year Est.	No of Branches	SWIFT	Profit in EB (2013/14)
1	Abay Bank S.C.	http://www.abaybank.com.et/	2010	79	ABAYETAA	75,000,000.00
2	Addis International Bank	http://www.addisbanksc.com/	2011	18	ABSCETAA	60,000,000.00
3	Awash International Bank	http://www.awashbank.com/	1994	191	AWINETAA	861,000,000.00
4	Bank of Abyssinia	http://www.bankofabyssinia.com/	1996	111	ABYSETAA	351,300,000.00
5	Berhan International Bank	http://berhanbanksc.com/	2010	46	BERHETAA	131,000,000.00
6	Bunna International Bank	http://www.bunnabanksc.com/	2009	72	BUNAETAA	109,000,000.00
7	Commercial Bank of Ethiopia	http://www.combanketh.et/	1963	909[2]	CBETETAA	9,700,000,000.00
8	Cooperative Bank of Oromiya(s.c.)	http://www.coopbankoromia.com.et/	2005	190	CBORETAA[3]	485,000,000.00
9	Dashen Bank	http://www.dashenbanksc.com	2003	146[4]	DASHETAA	928,000,000.00
10	Debub Global Bank	http://www.debubglobalbank.com/	2012	32	DEGAETAA	19,000,000.00
11	Development Bank of Ethiopia	http://www.dbe.com.et/home/	1909	43	BEETETAA	491,000,000.00
12	Enat Bank	http://www.enatbanksc.com/	2013	7	ENATETAA	39,000,000.00
13	Lion International Bank	http://www.anbesabank.com/	2006	67	LIBSETAA	128,000,000.00
14	Nib International Bank	http://www.nibbank-et.com/index.php	1999	98	NIBIETTA	420,000,000.80
15	Oromiya International Bank	http://www.orointbank.com/	2008	115	ORIRETAA	205,000,000.40
16	United Bank	http://www.unitedbank.com.et/	1998	108[5]	UNTDETAA	350,000,000.00
17	Wegagaen Bank	http://www.wegagenbanksc.com/	1997	98	WEGAETAA	394, 000,000.30
18	Zemen Bank	http://www.zemenbank.com/	2009	1	ZEMEETAA	131,000,000.00
	Total			2357		14,425,000,000.00

Source, /Website of the National Bank of Ethiopia/

Appendix v

Heteroscedasticity Test: White test

F-statistic	1.251137	Prob. F(21,65)	0.2421
Obs*R-squared	25.04361	Prob. Chi-Square(21)	0.2453
Scaled explained SS	352.8930	Prob. Chi-Square(21)	0.0000

Appendix vi

Table 4.3 Correlation Matrix between independent variables

	NIM	DBA	DPA	LD	BS	SPREAD	GROWTH
NIM	1.000000						
DBA	0.147085	1.000000					
DPA	0.217250	0.260951	1.000000				
LD	-0.20523	0.004066	0.337061	1.000000			
BS	0.055244	-0.02313	-0.46597	-0.66242	1.000000		
SPREAD	0.298333	0.157430	0.321140	0.485491	-0.09799	1.000000	
GROWTH	0.312414	0.692200	0.159802	-0.4517	0.500619	-0.0676	1.000000

Source: Financial statements of sample banks and own computation