



**THE EFFECT OF LEVERAGE ON ETHIOPIAN PRIVATE COMMERCIAL
BANKS' PROFITABILITY**

By

Seyoum Tesfaye

**A Thesis submitted to the department of accounting and finance in partial
fulfillment for requirement of Degree of Masters Science in Accounting and
Finance**

Advisor

Degefe Duressa (PhD)

Addis Ababa University

College of Business and Economics

Department of Accounting and Finance

June, 2018

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School of Graduate Studies
Statement of certification

This is to certify that the thesis entitled, “**The effect of leverage on Ethiopian Private Commercial Banks’ profitability**” was carried out by Seyoum Tesfaye under the supervision of Degefe Duressa (PhD), submitted in partial fulfillment of the requirements of the degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Internal examiner: Tekalign Nega (PhD) Signature _____ Date _____

External examiner: Arega Siyoum (PhD) Signature _____ Date _____

Advisor: Degefe Duressa (PhD) Signature _____ Date _____

Chair of the department or graduate program coordinator

Statement of Declaration

I, Seyoum Tesfaye declare that this thesis entitled “**The effect of leverage on Ethiopian Private Commercial Banks’ profitability**” is outcome of my own effort and that all sources of materials used for the study have been properly acknowledged. I have produced it independently except the guidance and suggestion of the thesis Advisor. This empirical Study submitted for the award of degree of Master Science in Accounting and Finance, to Addis Ababa University at Addis Ababa, Ethiopia, is my original work and it has never been presented in any universities.

By: Seyoum Tesfaye

Signature_____

Date_____

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List of Acronym

ATM - Automatic Teller Machine

CLRM - Classical Linear Regression Model

DCL - Degree of Combined Leverage

DFL - Degree of Financial Leverage

DOL - Degree of Operating Leverage

EBIT - Earnings before Interest and Tax

EBT - Earnings before Tax

EPS - Earning Per Share

ERCA - Ethiopian Revenue and Custom Authority

GDP - Gross Domestic Product

MFI - Micro-Finance Institutions

MM - Modigliani and Miller

NBE - National Bank of Ethiopia

NPV - Net Present Value

OLS - Ordinary Least Square

ROA - Return on Asset

ROE - Return on Equity

ROI - Return on Investment

SP - Share Price

Abstract

The main objective of this study is to examine the effect of leverage on Ethiopian private commercial banks' profitability. For this purpose, from private commercial Banks engaged in commercial banking activities ten private commercial banks was studied. The study covered nine years' period (2008/09-2016/17). The dependent variable was the return on equity (ROE) used to measure the profitability. And the independent variables were the degree of operating leverage and degree of financial leverage to measure the leverage of the institutions. To ensure the accuracy of the result of the regression model used two control variables these were operational efficiency and bank size. In order to address the main objectives of this study balanced panel data was used. The panel data were obtained from the audited financial statements of ten private commercial banks' and National Bank of Ethiopia. The data were analyzed by using panel data analysis techniques by using Eviews 8. The descriptive statistics and diagnostic tests were discussed, followed by, regression analysis. Then, regression result indicates that, the degree of operating leverage had positive and statistically insignificant impact, the degree of financial leverage had negative and statistically significant impact on profitability of private commercial banks. Moreover, operational efficiency also had negative and statistically strongly significant relationship with profitability. Finally, bank size had statistically significant impact on profitability. Therefore, private commercial banks could be increased income to improve profitability since they are operating above breakeven point. They should also give due consideration to manage their debt properly, increase loan and raise equity financing optimize profitability.

Key words: Return on equity, Degree of operating leverage, Degree of financial leverage, Private Commercial Banks and Panel data

Chapter One

Introduction

1.1. Background of the study

With increasing globalization, industrialization has increased too many folds and requires enormous resources to produce expected returns to end users and investors (Zafar, 2010). Wealth creation is a central message of conducting a business (Myers, 2003). The business will succeed if a proper supply of fund when it is needed and at a required amount will be properly managed. The idea of running a business is surrounded by many decisions which determine the success of that particular business. The general decisions are how to finance the business, how to structure the business, how to manage the business and more of such nature. The major decision to the business owner is financing decision since the finance acts as a pillar for business success which is used for different purpose in the operations. Financing decision could do with attention. Uses of the fund comes from and aiming at exploring the benefits and advantage of each source to the success of the business.

The long-term decisions are a mode of capital sourcing and dividend decisions while the short-term financing decisions involve liquidity decisions. The key responsibility of determining the optimal mix of debt and equity that will ensure maximization of shareholders wealth falls under the financial managers (Maina, 2013). The criteria used by financial managers to choose equity or leverage financing have been a problem for many years. Modigliani and Miller (1958), in their proposition I without tax, argue that leverage is independent of a firm's cost of capital. Subsequently, Modigliani and Miller (1963), in their proposition II with corporate tax, argue that leverage reduces firm's cost of capital, but tax savings from debt is offset by the rising cost of equity. These propositions increased the attention of researchers in conducting research to inquire the truth of this proposition.

The total combination of common equity, preferred stock and short and long-term liabilities is referred to as a financial structure. That is the manner in which the firm finances its assets constitute its financial structure. If short-term liabilities are subtracted from the firm's financial structure, we obtain its capital structure. In other words, the firms permanent or long-term financing consisting of common equity, preferred stock, and long-term debt is called capital structure (VanHorne, 2002). A firm can finance its investment by debt and/or equity. An

unlevered firm is an all-equity firm, whereas a levered firm is made up of ownership equity and debt.

In various literature operating and financial leverage considered as a benchmark for capital structure. Operating leverage refers to the percentage of fixed costs that a company has. According to Head (2007) degree of operating leverage provides a dramatic explanation of the extent to which an organization relies on fixed costs in its mission for maximizing its operating profit. In effect, if the variable cost component is largest among the operating cost of the organization then there is also the possibility that the operating leverage of the company will decline and an equivalent effect can be predicted on the net profit for a company with a high degree of financial leverage. In relation with this, Zubairi (2014) noted that:

“...it makes such companies riskier because if the level of income is not sufficiently high, the fixed operating costs may not be sufficiently covered, in this manner resulting in an operating loss or a low operating profit. Thus, while a high degree of operating leverage will increase financial performance in times of rising sales or inflow of income; operating profits will reduce rapidly when sales are showing a declining trend” (p.8).

Financial leverage refers to the amount of debt in the capital structure of the business firm. The use of fixed-charged funds, such as debt and preference capital along with the owners' equity in the capital structure is called financial leverage or gearing (Dare, 2010). The degree of financial leverage is higher in those companies which operate with a large amount of debt capital.

Several types of researches have been done concerning the leverage and firms' performance they reached conflicting conclusions or report mixed results using various approaches. For example, Edson (2015) and Gatsi (2013) revealed that capital structure has a negative effect on firms' performance. Besides, researchers such as, Anton (2016); Kumar (2014); Khanfar (2014) and Gweyi (2014) also documented leverage has a positive effect on profitability.

However, financing decision in commercial banks is not similar to other business firms due to the nature of operations of financial institutions. Although commercial banks are able to raise finance using equity and debts, the fact that they mobilize deposits which can act as a source of finance, make their capital structure unique as compared to other business firms (Taani, 2013). To what extent does leverage in commercial bank affect performance and in which direction, is among the major concern of studies in commercial banks. Different studies have tried to examine the application of different capital structure theories in the banking sector and other financial

institutions and their results are diverse for example Tamirat (2015) in his study show that capital structure has a positive effect on profitability. Contrary, Aragaw (2015) conclude debt capital has negative effect on profitability. Among the theoretical arguments on banks' capital structure versus performance, the amount of deposits mobilized in most banks are lower than the amount of loan required by clients hence banks use debts and equity to finance such need as well as investing in other chosen projects (Yafeh, 2003). Hence, banks should have highly levered as compared to other non-financial institutions to enable them to serve more clients' needs. Aragaw (2015) Established, commercial banks are highly leveraged. He observed that 89% of the total capital of commercial banks in Ethiopia in the period his study conducted was made up of debt. Of this, 75% constitute deposit and the remaining was non-deposit liabilities. Although banks need enough capital to finance its operation, most managers often seek to hold less capital due to a cost associated with holding capital, as a result most of them hold capital as per requirements of laws and regulation on minimum capital reserves.

1.2. Statement of the problem

The degree of leverage can be classified into operating and financial leverage. By way of clarification, the degree of operating leverage evaluates the extent to which firms of which private commercial banks are consider fixed cost as part of their operational cost to determine the level of profit (Zubairi, 2014). While the degree of financial leverage measures the extent to which debt finance which forms a component of the capital, contribute to the debt obligation of the financial institution (Gatsi, 2013).

Both types of leverage affect the level and variability of the firm's after-tax earnings, and hence the firm's overall risk and return. As indicated by Zafar (2010) fixed financial charges are to be paid irrespective of the level of EBIT as they are fixed in nature and do not vary with earnings before interest and tax. Hence, an increase in earnings before interest and tax will result in a higher percentage increase in return on equity. It is because the degree of financial leverage largely depends on the amount of interest and fixed financial charges. If firms have more debt than equity which further requires paying more interest on the debt. Since, payment of debt is required by law regardless of a company's profit margins (Mwangi, 2014). This resulted in the degree of financial leverage is higher ultimately financial risks are higher. On the other hand, when financial institutions which decide to operate with high levels of fixed cost are likely to increase their cost

of operations which will eventually be reflected in the interest charged to their clients, all things being equal when the lending rate a financial institution offers to its client's increases, they will explore other sectors in which they can borrow with the minimum cost as possible. This may reduce their client base and cause a significant effect on revenue generation capacity (Gatsi, 2013). Commercial banks represent the primary source of credit to small businesses and many individuals. As indicated by Zafar (2010) commercial banks must optimally justify the adopted measures for exploring profitability and optimizing efficiency. It has to establish itself better than international standards and have to develop the best capital adequacy system, prudential regulations, accounting and disclosure standards, financial soundness and consistent supervisory practices and level of compliance with the Basel Committee's Core Principles for Effective Banking Supervision. Even though the private commercial banks in Ethiopia share 89% of the banking industry, publicly owned banks are shared more than half of the entire capital of the sector (Hailu, 2015).

In addition, in the contexts of Ethiopia, there are studies in relation to determinants of capital structure, the impact of capital structure on profitability and determinants of profitability by different researchers. For example, Asrat (2016) wrote capital structure and financial performance using evidence from Ethiopian cement factories. Moreover, in the banking industry of the country, Aragaw (2015) conducted a study on the impact of capital structure on profitability of commercial banks; Abera (2012) assessed factors affecting profitability of banks with a focus on overall performance in addition Tamirat (2015) investigated the effect of debt financing on profitability of commercial banks. Beside, Belayneh (2011); Dawit (2017) and Habtamu (2012) conducted their study on the determinant of commercial banks profitability.

However, in all these studies carried out locally, the researcher found that no one scholar has emphasized the effect of leverage on private commercial banks. One major goal of firms are maximizing profits and shareholders' wealth; besides these commercial banks also need to comply with various requirements laid down by the National Bank and one of the requirements is capital adequacy. One may want to know, to what extent Ethiopian private commercial banks profitability affected by its leverage position. Therefore, this study is aiming to determine how the profitability of private commercial banks in Ethiopia is affected by leverage.

1.3. Objective of the study

1.3.1. General Objective

The general objective of this study is to examine the effect of leverage on Ethiopian private commercial banks' profitability.

1.3.2. Specific Objectives

- To examine the operating leverage of Ethiopian private commercial banks'.
- To evaluate the financial leverage of Ethiopian private commercial banks'.
- To examine the relationship between leverage and profitability.
- To determine the effect of leverage on private commercial banks profitability.

1.4. Research Hypothesis

Based on the theories and empirical studies the following research hypotheses were developed to find out the impact of leverage on profitability.

- H1: Degree of operating leverage has positive and significant effect on return on equity.
- H2: Degree of financial leverage has negative and significant effect on return on equity.
- H3: Operational efficiency has negative and significant effect on return on equity.
- H4: Bank size has positive and significant effect on return on equity.

1.5. Significance of the study

As indicated in Kothari (2004) beside used as integral tool to facilitate the decisions of the policymaker research has special significance in solving various operational and planning problems of business and industry, way to attain a high position in the social structure and a mean to development of new styles and creative work. The results of this research used managers of private commercial banks to decide appropriate leverage policy. In addition, it will serve as a base for policymakers such as National Bank of Ethiopia. It also enables investors and customers to have information on status of their banks. It also provides basic information for future researchers in the sector.

1.6. Scope (delimitation) of the study

The scope of this study was limited to the effect of leverage on profitability of private commercial banks over the period 2008/2009-2015/2017. From the financial institutions those operating in Ethiopia, this study considers particularly the banking sector. Of sixteen private commercial banks operating in Ethiopia, this study taken ten private commercial banks that were registered and licensed based on banking business Proclamation No. 592/2008 before nine years ago. This study used two degree of leverage measures these are: degree of operating leverage and degree of financial leverage. Operational efficiency and bank size were taken as control variables to ensure the accuracy of the result of the regression model.

1.7. Limitation of the study

Operating and financial leverage need detail separate investigation. But, for the current study these two variables were used together. Operating leverage was used to investigate the effect of private commercial banks cost structure on their profitability and financial leverage (to examine debt capital effect on profitability). Regarding the operating leverage most literatures previously done were in favor of non-financial sectors since, the nature of banks financial statement format differs from non-financial sectors this was a challenge tackled by the researcher.

1.8. Organization of the paper

This paper organized in to five chapters. The second chapter briefly presents the theoretical and empirical literatures. Then the third chapter deals about research methodology. The fourth chapter presents data presentation and analysis. Finally, chapter five states the conclusion and recommendation of the researcher.

Chapter Two

Literature Review

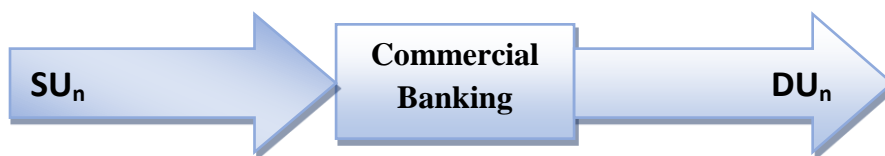
2.1. Introduction

This chapter presents the theoretical and empirical literature review regarding leverage and financial performance relationship. In a separate section nature of commercial banks, the theoretical background behind Leverage, scientific studies which examined the impact of leverage on firm's financial performance, conclusions on the literature review and identification of the knowledge gap will present. Finally, based on theoretical and empirical literature the conceptual framework was construct.

2.2. Commercial Banks

Banks are major financial institutions play an important role by transferring fund from surplus unit to deficit unit in the economy. Bank means accompany licensed by the national bank to undertake a banking business or bank owned by the government. Banking business such as: receiving fund form the public via a means that the national bank has declared to be an authorized manner of receiving fund, using the fund received the whole or in part for the account and at the risk of the person undertaking the banking business for loan or in the manner acceptable by the national bank, buying and selling of gold and silver bullion and foreign exchange, transfer fund to other local and foreign person on behalf of the bank themselves or their customers, discounting and negotiation of promissory note, draft, bill of exchange and other evidence of debt, any activities recognized as customer banking business (NBE, 2008). The definition points out those commercial banks are doing a business of finance. It does by collecting deposits on one side and makes the loan using the collected finance in another side. These are two main activities of a commercial bank can be conceptualized as shown below:

Figure 2.1: Commercial Bank Conceptual Framework



Source: researcher compilation from literatures

Where:

SU = Surplus unit

DU = Deficit unit

n = is 1, 2, 3....., representing either depositors or lenders

Total deposit (TD) is expressed as:

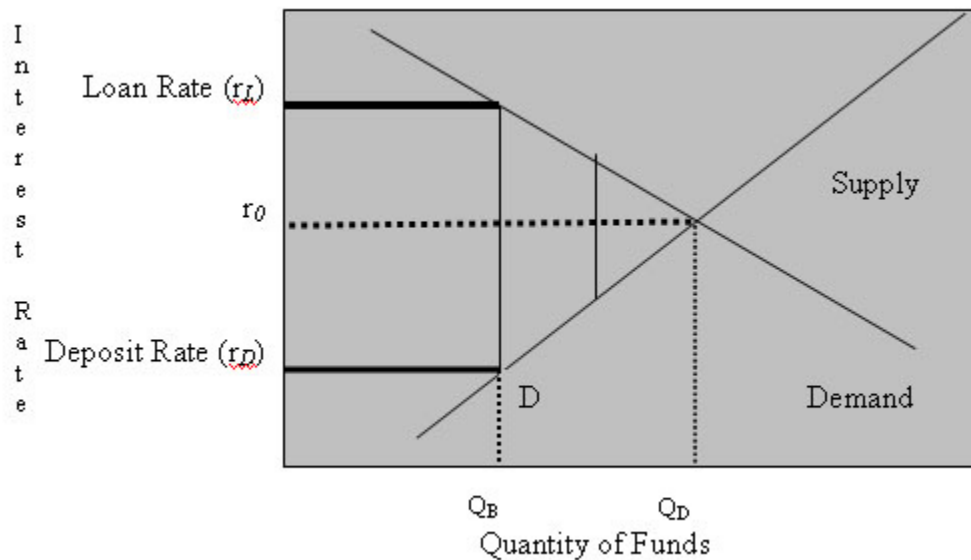
$$TD = SU1 + SU2 + SU3 + \dots + SUn$$

Total loan (TL) is expressed as:

$$TL = DU1 + DU2 + DU3 \dots + DUn$$

For efficient banking sector, the total loan (TL) demanded by the lenders is equal to the amount of total deposits (TD). This point is called market equilibrium of the banking sector. At equilibrium point, the profit (spread) is zero since the lending rate and deposit rate is very close as explained in the illustration below for Market and Bank Equilibriums and Efficient Bank Intermediation which is assuming two intermediation services that are mobilizing deposit and lending (Edson, 2015).

Figure 2.2: Market and Bank Equilibriums and Efficient Bank Intermediation



Source: (Edson, 2015, p 11)

If there are no costs of operating the bank, the market equilibrium point is E₀, at which the equilibrium interest rate, r₀, represent both deposit and loan/lending rates i.e. Deposit rate (r_D) = Lending rate (r_L) also the Demand (D) and Supply (S) of loanable funds are equal. But in reality, the costs for operating a bank are there, which makes the lending rate to be high compared with

the deposit rate. The commercial bank obtains the profit by giving the depositors low-interest rate and demanding higher interest rate from the borrowers called the spread (Edson, 2015). Mathematically is expressed as:

$$\text{Spread} = rL - rD$$

Where

rL = is the interest rate the bank charges the lender,

rD = is the interest rate the bank gives to the depositors

For a well-regulated banking sector, the spread is very small and the bank profitability then depends on economies of scale through mobilizing many deposits. Naturally, it can be conceptualized that high deposits with low lenders will result from the commercial bank into lost while low deposits with high lenders will result high profit because the interest rate will increase as the law of demand and supply states (Edson, 2015).

According to Mayer (2003) deposits come from economic agents with surplus funds; which means deposits depends on the economic state of the depositor. A booming economy, the deposits will be high compared during an economic recession. The commercial banks get profit offer by charging fee and commissions for offering respective services like safekeeping of valuables, documents and securities, acting as agents for collection of utility bills, providing credit information or references, providing financial guidance and advice (advisory services) e.g. financial planning and counseling, financial management advices for customers, other income still comes from service charge on customer accounts, loan application fees ,ATM withdrawal charges , VISA card fees. Commercial banks also get profit from commission on letters of credit, fee on issue of bank cards, fee on local transfers and drafts, point of sale fees , fee on international telegraphic transfers, commission on guarantees and indemnities, commission on mobile banking, salary processing fees, bills discounted and significant cash withdrawal without prior notice (Edson, 2015).

2.3. Leverage

Leverage has various meaning in different disciplines. It is the employment funds on which the company has to incur fixed cost or return (Elangkumaran, 2013). One of the major reasons that companies using debt is to enhance shareholders earning. Firms employed debt on their operation

pay less tax than those unlevered firms because interest payment is tax deductible expense. The asset or source of fund is used as a force to make better the firm's ability to increase profitability higher. Higher leverage implies that higher outside borrowing and hence it is riskier if the firms earning capacity is reduced. But, only when return on investment higher than the cost of outside borrowing the leverage effect will be complimentary (Elangkumaran, 2013).

2.3.1. Operating leverage

A breakeven analysis shows us that there are essentially two types of costs in a company's cost structure: fixed costs and variable costs. Operating leverage means the relative importance of fixed cost in the firms cost structure. It is the relationship between fixed and variable cost in the firm's cost structure. Fixed costs are costs that have to be met regardless of output and revenue. The higher the proportion of fixed cost to variable cost in the firms cost structure, the higher the firms break-even volume of output. Companies Such as highly automated and capital intensive, employed a highly skilled worker who must be retained and paid even when sales are low and have high product development cost that must be maintained to complete research and development projects (Brigham, 2011). When there is a high percentage of fixed cost in their cost structure, the firm is said to have a high degree of operating leverage. A degree of operating leverage defined as other things remains constant the percentage change in EBIT relative to a percentage change in sales. Since EBIT depend on sales, the change in sales will affect EBIT. Hence, the variability in EBIT due to change in sales is affected by the composition of fixed and variable costs (Elangkumaran, 2013).

2.3.2. Financial leverage

Financial leverage defined as a firm's decision using fixed charge source of fund. When the firms use financial leverage the business risk is concentrated on the common stockholders. Return on invested capital is the same before and after using financial leverage because the firms financing decision doesn't affect operation. Since there is interest payment (share of creditor), net income is lower after using financial leverage but, net income is shared over small equity bases and return on equity will be higher (Brigham, 2011). Firms employed debt on their operation (levered firms) pay less tax than unlevered because interest payments are tax deductible for tax purpose. For instance in Ethiopia as stated in ERCA (2016) Proclamation No. 979/2016, article 23 sub-article 1 deduction of interest paid or payable on debt or other instrument or agreement that give rise to the

interest to derive business income within the rate used between national bank of Ethiopia and commercial banks shall be allowed in determining the taxable income of tax year.

Even though the net income of levered firm distributed to stockholder as a dividend lower than that of unlevered firm, total distribution is higher because total distribution by the levered firm includes both to debt holder and stockholder (interest and dividend respectively). Financial leverage measures firms' exposure to the financial risk. Financial leverage used by firms is required to earn more return on fixed charge fund than their cost. It has a direct relationship with return on equity means surplus increase owners' equity deficit decrease owner equity (Elangkumaran, 2013). Muthusamy (2011) Point out that financial leverage is Precondition for achieving optimal capital structure. An optimal capital structure can also guide firms' value and wealth of shareholders by reducing the cost of capital. Hence shaping the optimal debt level and its impact on firms overall capital structure is considered as a central issue under the firms' financial decision.

2.3.3. Leverage and return on equity (ROE)

There is a close relationship between companies' leverage and ROE. Leverage has a good and bad effect. Operating leverages cause a wide fluctuation in earnings before interest and tax for a given change in sales. If a degree of operating leverage (DOL) is higher and return on investment is greater than the cost of debt, the impact of leverage on return on equity will be favorable. But, if earning capacity of a firm is below expected return by lenders impact will be unfavorable (Elangkumaran, 2013). According to Patel (2014), operating leverage is greater for firms with a higher proportion of fixed operating costs. Higher financial leverage increases expected earnings until the debt to asset ratio reaches the optimum level. He also noted that the financial leverage used by every firm is anticipated to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owner's equity.

2.4. Capital Structure

There are many methods for the firm to raise its required funds; the most basic instruments are stocks or bonds. The mix of the different securities is known as its capital structure, so it can be defined as the combination of debt and equity used to finance firms. Effective financial management and what characters affect their capital structure are important for firms to obtain better operational performance. A false decision about the capital structure may lead to financial distress and even to bankruptcy. Capital structure varies considerably across industries even vary within the same industries. What makes this difference? And Capital structure and firms' performance are the main issues in finance. In an attempt to answer this question in early years different scholars develop a number of theories and later these theories have been subject to empirical tests (Brigham, 2011).

2.5. Theory of capital structure

A number of theories have been developed in explaining the capital structure. Among all these theories, MM's theory, static trade off theory, pecking order theory and agency cost theory are the most recognized which explains the formulation of capital structure.

2.5.1. Modigliani and Miller (MM) proposition I

This was the first published work which captured the attention of researchers. It was the most influential financial article initially written by Professor Modigliani and Morton Miller (MM) in 1958. This seminar presentation sometimes called leverage irrelevant theorem. Thus MM proved that nature of financing doesn't affect the firms' value. Based on this theory managers can decide to debt or equity financing but under very restrictive assumptions that exclude transaction cost, tax payment, at perfect capital market and with a homogeneous expectation (Miller, 1958). This theory was criticized for lack of credibility since no business can operate in an ideal environment. Even though some of MM's assumptions are unrealistic, their result is important by indicating conditions in which capital structure is irrelevant.

$$VL = Vu$$

Where:

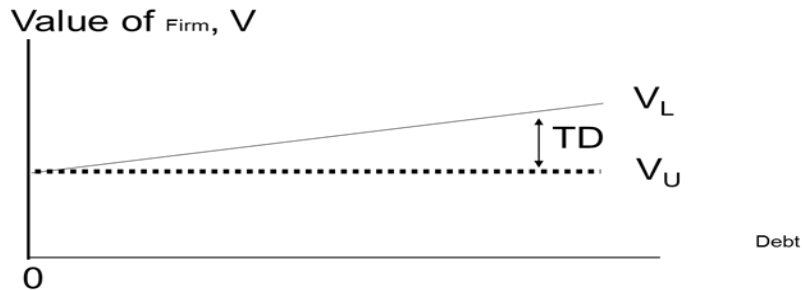
VL : Value of a levered firm

Vu : Value of an unlevered firm

2.5.2. Modigliani and Miller (MM) proposition II

After postulating the irrelevant theory in order to respond to the criticism (Miller, 1963) review the earlier position and proposed a new version by incorporating tax benefit of debt financing in the firm capital structure. Since interest is tax deductible expense firms that pay interest to receive a partial offsetting interest “tax shield” in the form of lower tax paid. Under this theorem even though on the initial work researchers argued that financial leverage is irrelevant on the financial performance to introduce the second way of looking that the value of a levered firm is equal to the value of identical un levered firm plus the value of tax effect. As shown on the following Figure 2.3 under MM with corporate taxes, the firm’s value increases continuously as more and more debt is used.

Figure 2.3 MM’s theory with tax



Source: Adopted from literatures

$$V_L = V_U + \text{value of side effect} = V_U + PV \text{ of tax shield}$$

Under this assumption the present value (PV) of tax shield is equal to the corporate tax rate.

$$V_L = V_U + TD$$

Where:

V_L: Value of levered firm

V_U: Value of unlevered firm

T: Corporate tax rate

D: The amount of debt

2.5.3. Trade of theory

This theory was stated by Myers (2001) the MM's result was based on one of the assumption that there is no bankruptcy cost. Debt financing not only produces tax benefit; it may also lead to bankruptcy. The firm faces financial distress due to the extremely high-interest payment which may lead to higher probability of bankruptcy. The question is how to balance between the tax benefit and the bankruptcy cost. According to this theory using debt in the capital structure offers tax shield and in order to gain this advantage firms try to follow high level of debt however high level of debt increase the possibility of bankruptcy because firms couldn't repay their obligation. Trade off theory suggested that firms should keep their debt level at optimum debt benefit or tax advantage equals the cost of possible financial distress. But, a highly profitable firm may have high debt since less likely to be subject to bankruptcy risk.

So debt financing is good but when optimized. In reality, the optimal level is not stable since bad circumstance normally occurs in the firm's environment as a result, the managers will struggle to adjust the level up to the optimal and it is a cyclic process. The target adjustment level in a simple form states that the changes in debt ratio are explained by the deviation of current debt ratio from the target. This model is expressed as a linear regression equation.

$$\Delta D_{it} = \alpha + \beta(D_{it} - D_{it-1}) + \epsilon_{it}$$

Where:

ΔD_{it} = Adjustment debt ratio for firm i at time t,

D_{it} = Target debt ratio for firm i at time t,

D_{it-1} = Current debt ratio,

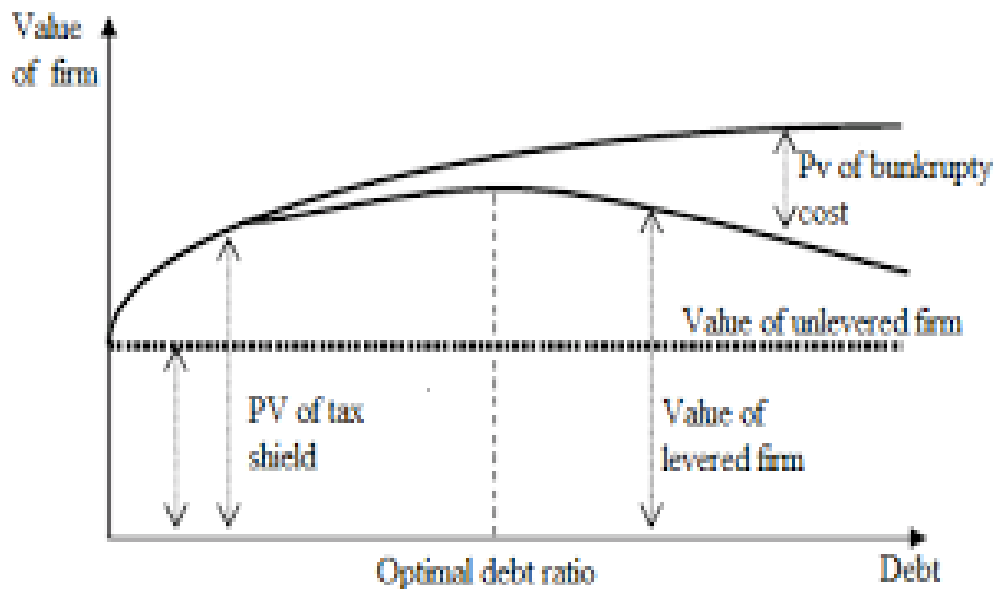
β = Target adjustment coefficient,

ϵ_{it} = Error term

A debt ratio of the gain due to tax shield is maximum but beyond that, the loss due to financial distress occurs. The hypothesis to be tested is $\beta > 0$ indicating the adjustment is towards the target, but also $\beta < 1$ which implying positive adjustment costs. The task for managers is to calculate the target debt ratio or optimal level by using historical data then using it as the benchmark for judging the level of debt. The problem with this model is that each firm will have its own optimal level of debt since the amount of tax shield differ from one firm to another.

The figure 2.4 shows that the market value of a company with more debt increases up to a certain point (optimum). More debt above this point decreases the value of the company due to the cost of financial distress. It can be concluded that companies need to search for a balance between the tax benefit and cost of financial distress which gives the highest firm value.

Figure 2.4 static trade off theory



Source: Adopted from literatures

2.5.3.1. Empirical test on a trade of theory

According to the studies of Ramadan (2015) test the trade-off theory during the period 2000-2014 utilizing data from Jordanian industrial listed firms. Found that there was a direct relationship between firms' size and leverage this is in line with the trade-off theory because large firms finance their needs of the fund through issuing debt rather than equity. And finally, conclude that Jordanian industrial firms partially follow trade-off theory.

2.5.4. Packing order theory

The pecking order theory of capital structure is one of the most influential theories of corporate finance. This theory was postulated by (Myers, 1984). The theory focused on how firms' management decides to finance the firms' operations. According to this theory debt financing is connect the company to the obligation of periodically meeting fixed interest charges and to the

repayment of the principal which somehow become burden to the firm. The present of asymmetric information also leads mispricing of new securities. Investors generally perceive that managers are better informed of the price sensitive information of the firms. Investors' perception is such that managers issue risky securities when they are overpriced. This perception of investors leads to the underpricing of new equity issue. Sometimes this underpricing becomes so severe that it causes significant loss to the existing shareholders.

To avoid such problems this theory suggested that firms' first use internally generated fund by reinvesting its net income and selling short-term marketable securities because there is no flotation cost or negative signal. When internal financing exhausted issued debt because it has lower flotation cost than equity and no negative signal. But the required fund is more than this issuing security is the final option. However, if they do require external financing they will issue the safest security first, showing that equity financing will be least favorable as compared to debt financing.

2.5.4.1. Empirical test on pecking order theory

In the past, the pecking order theory is tested by different researchers. For instance, in the article of Goyal (2003) Test the pecking order theory of corporate leverage on a broad cross-section of publicly traded American firms from the period of 1971 to 1998. The researchers finding showed that in contrary to the pecking order theory, net equity issues follow the financing deficit more closely than do net debt issues. Therefore, this research doesn't support the pecking order theory.

Khan (2015) test the pecking order theory of capital structure by taking a cross-section of 12,244 publicly traded corporations in the U.S. from the time period of 1999 to 2009. And observed that, there was stronger relationship between net equity issued and financing deficit than net debt issuance and financing deficit. Finally, conclude that there is limited evidence to support pecking order theory.

2.5.5. Agency theory

The conflict that arises between the managers and the shareholders is; shareholders assume that managers do not spend the cash in the right way; this is due to the different interests. The goal of the managers is to find investments that will lead to the development of the company. More growth means more power for them, because of the increasing resources. A developing company usually means a higher compensation for managers as well. Another reward for managers when

they bring good work can be a promotion. Therefore, managers first investigate how they can increase their own wealth before thinking about the shareholders' interests. The shareholders of the company want the manager to spend money in such a way that they will get the highest value or dividend for their investment in the shares of the company. To let the company, grow, investments must be made. Hence, managers use some of the money that can be paid as dividends for their own interest to expand the company's value (Jensen, 1976).

According to Myers (2001) the free cash flow theory is developed due to a sensitivity of companies to overinvest. This is the case when firms have a large amount of cash flow but there is not enough profitable investment. Managers act in their own interests. Therefore, if there were no profitable investments left, managers would like to invest in unprofitable projects to do everything in their power to let the company grow. By borrowing money companies can prevent this threat, due to the lower amount of free cash flow that is available. Only this is not intended for companies with potential high profitable investments. It is not the intention that managers have no free cash flow to spend on profitable projects (Jensen, 1976).

Agency costs can be described as the costs that are needed to monitor and control the managers of the company (Myers, 2001). The management acts as an agent for the shareholders to invest their money in the right way. To control that whether the money is invested in the right way or not, costs must be made, because of the different perceptions and interest of the managers (Jensen, 1976).

Another threat that leads to agency costs is underinvestment; this is the case when companies need to invest in low risk assets by means of the debt agreement. The problem is that even if the asset has a positive NPV, only the debt providers will get their money due to the low return which has been provided with the asset. This leads to a conflict between the shareholders and debt providers. To control the manager's not investing into risky projects agency cost must be made (Myers, 1984)

Table 2.1 Summary of theoretical proposition

S No.	Theories	The effect of increase in debt
1	MM's proposition I& II	Debt has no effect under the assumed conditions
2	Trade of theory	Debt has negative effect on profitability if not optimized
3	Pecking order theory	Debt has negative effect on profitability
4	Agency cost theory	Debt has positive effect on profitability

Source: researcher compilation

2.6. Empirical studies on the impact of leverage on profitability

This section examined the studies conducted to investigate the impact of leverage on the profitability of financial firms and non-financial firm. Therefore, only relevant studies conducted in this area are examined. Methodology, year of study and the outcome of it is summarized to observe their harmonization with the theories explained above. Comparison between the outcome of these studies and the claim of the theories will be established in order to see their implication.

2.6.1. Empirical Studies on non-financial Sectors

Elangkumaran (2013) Investigate the impact of leverage on earning per share and share price. The investigation was performed using 20 sampled companies listed on the Colombo Stock Exchange (CSE) in Sri Lanka for the period from year 2007/2008 to 2011/2012. The study used Degree of Operating Leverages (DOL), Degree of Financial Leverage (DFL) & Degree of Combined Leverage (DCL) as the independent variables and Earning per Share (EPS) and Share Price (SP) as the dependent variable. Correlation coefficient and linear regression used to measure the variables. The findings revealed that only 4% earnings can be explained by DOL, DFL, and DCL and there is no significant relationship with EPS. It is also found that 3% SP is attributed by DOL, DFL, and DCL and there is no significant relationship with SP. Therefore, leverage has no significant impact on the earning capacity of the listed companies in CSE, in addition, the results indicated that highly leveraged firms were less risky.

Kumar (2014) in the study of leverage and its relationship between profitability in Bata India Limited argued the financial performance of the Bata India is satisfactory and the Bata India is employing fewer debt funds so it can't get the financial leverage benefits. With regard to profitability and leverage relationship analysis, the researcher observed that degree of financial leverage positively correlated with the ROI but it was not at optimum level; the degree of operating leverage is a statistically significant positive correlation with the ROI. Moreover, degree of combined leverage is positively correlated with ROI of Bata India. The study suggested to Bata revise its capital structure which should include the optimum blend of equity and borrowed funds so that it has a positive impact on Return on Investment. Therefore, the Bata India has to revise its capital structure so that financial leverage will help to maximize the shareholders' wealth.

Khanfar (2014) Conducted a study to identify the financial leverage ratio and the rate of return on investment on profitability for sources of the funding in tourism companies operating in Jordan. The results indicate financial leverage has statistically significant impact on profitability of the Tourism companies.

Anton (2016) also studied the impact of leverage on firm growth in periods of economic growth and economic uncertainty using data from sample of 63 Romanian listed firms on the Bucharest Stock Exchange over the period 2001-2011 and several alternative measures for firm growth such as sales growth, assets growth, and employment growth and total liabilities to total assets as a measure of leverage were used. The results of fixed effects regression model show that the leverage has a positive effect on firm growth. Furthermore, this study shows that highly leveraged firms grow faster as lower leveraged firms during the period examined.

Saxena (2016) Investigated whether high financial leverage has a significant and positive impact on firm's value. Eleven sampled companies listed on Indian stock exchanges, having more than fifty percent of debt ratio in their capital structure for the time period of 2001-2015 were used in their study. The dataset was analyzed using descriptive analysis; correlation test and multiple regression analysis. ROE was a dependent variable representing the firms' value and DR and DER were independent variables as a proxy for financial leverage. The study revealed that DR has a low degree of positive correlation with (ROE) whereas DER has a negative relationship with (ROE) therefore financial leverage has either very low degree of positive correlation or negative correlation. But only 16.4 percent of the dependent variable (ROE) was explained by the independent variables DR and DER.

Asrat (2016) Studied the relationship between capital structure and financial performance of cement companies in Ethiopia for the period over 2010-2014. The researcher used return on asset (ROA) and return on equity (ROE) to measure financial performance, debt to equity ratio (LTDTE) as a measure of capital structures and control variables such as: tangibility (TAN), capital adequacy (CA), liquidity (LOGLQ), size, gross domestic product (GDP) and business risk. The study applied explanatory research design. In connection to this, a sample of 8 cement companies was taken and secondary data was collected from the audited financial statement of the selected companies. The result of random effect multiple regressions showed that capital structure measured by long-term debt to equity ratio (LTDTE) has a significant positive relationship with return on asset (ROA). Beside this, capital structure measured by a logarithm of long-term debt to equity ratio (LOGLTDTE) has a significant negative relationship with return on equity (ROE) Finally the researcher concludes that an appropriate mix of the capital structure should be adopted in order to increase the financial performance of cement companies in Ethiopia.

Olang (2017) also conduct a research on 66 listed firms in Nairobi Stock Exchange (NSE) by taking 30 of them using purposive sampling technique in order to investigate the effect of financial leverage on the profitability. In this study, descriptive and inferential statistics technique were employed to analyze data. The study revealed that firm size has a statistically significant effect on profitability. Liquidity and growth opportunity, on the other hand, have no significant effect on the profitability of firms.

2.6.2. Empirical Studies on financial Sectors

A study conducted by Zafar (2010) in order to analyze the leverage position of Indian banking industry and its impact on EPS, its risk and return and profitability. For the purpose 10 year data from 2000-01-2009-10 of ten Indian banks were taken, result reveals that there is a significant relationship between Degree of combined leverage and EPS and Degree of Operating leverage and EPS. But there is no relationship between financial leverage and EPS.

A research on how profitability of insurance firms in Ghana influenced by working capital management and leverage by Gatsi (2013) using 18 firms and taking the current ratio as representative of working capital management policy and financial leverage and operating leverage as the benchmark for capital structure using panel data methodology, found that, financial leverage has a significant negative effect on the profitability of the insurance companies; operating

leverage has a positive and statically significant influence on profitability; further supplementary analysis was also undertaken to assess the impact of premium growth, GDP and firm size on profitability.

Gweyi (2014) Investigate the effect of the financial leverage on financial performance of deposit-taking SACCOS in Kenya. For the purpose 40 sampled Savings and Credit Co-operative Societies (SACCOS) registered by SACCO Society Regulatory Authority (SASRA) extended from the period 2010 to 2012 were taken. In connection, secondary data from the financial statements of the various deposit-taking SACCOS and both descriptive and analytical design were adopted. The results show that there was a positive correlation between financial leverage (DE) with financial performance (ROE).

Research by Wabwile (2014) to analyze and compare performance amongst tier 1 commercial banks listed on NSE (asset base above 100 billion) in relation to their financial leverage. Specific indicators were used to measure and compare variance in their performance were profitability Return on assets (ROA) and Return on capital employed (ROCE), the growth of the firm Earnings per share (EPS) and Dividend yield (DY) and value of the firm Price-book value (PBV) was used. In addition, person correlation analysis and regression analysis were used to the correlation of data, F-test, Durbin Watson test, adjusted R^2 , the mean and standard error of the data. The finding indicated that debt ratio increases, it means the banks' most assets are being financed by both long-term and short-term liabilities and hence the return on such assets as well as that on capital employed is reduced to provide for the outstanding liabilities. This examination found a negative correlation between debt asset ratio and debt to equity ratios with ROAC and ROCEC. There is a positive correlation between the debt asset ratio and the EPS.

Edson (2015) in the study of examine the relationship between the financial leverage and commercial bank's profitability in Tanzania. For the purpose, he used secondary data from audited financial statements of listed commercial banks at Dares Salaam Stock Exchange (DSE) over the time period 2007 to 2013. Descriptive statistics and regression analysis were employed. Both Return on Average Asset (ROA) and Return on Average Equity (ROE) were used as a tool to determine the bank's profitability with independent variable measured by Debt Ratio (DR). The study found that change of debt amount in the capital structure has a negative effect on return on average asset and a no-effect on return on average equity.

There are also other researchers in Ethiopia they investigate the relationship between capital structure and commercial banks profitability. For instance: Hailu (2015) study the impact of capital structure on profitability of core business operations of commercial banks in Ethiopia. To address the objectives quantitative panel data methodology obtained from the audited financial statements of eight commercial banks and National Bank of Ethiopia for the period of twelve years (2001/02 – 2012/13) were used. In addition, for the data analysis panel data fixed effect estimation model was applied. The researcher observed that 89% of the total capital of commercial banks in Ethiopia in the period under study was made up of debt. Of this, 75% constitute deposit and the remaining was non-deposit liabilities. This has reaffirmed the fact that banks are highly levered institutions. The findings revealed that capital structure as measured by total debt to asset had statistically significant negative impact, whereas deposit to asset had statistically significant positive impact on profitability of core business operations of commercial banks. Moreover, loan to deposit, spread and asset size also had statistically significant and positive relationship with profitability. However, growth found to have statistically insignificant impact on profitability. Finally, the researcher recommended that, banks should give due consideration to manage their debts properly, mobilize deposit sufficiently, increase loan advances, spread, and size in their financing decisions. Furthermore, banks also advised to reduce non-deposit debt financing and raise equity financing so that to keep costs of financing at minimum level and hence optimize profitability and the value of banks.

Besides, Tamirat (2015) conducted a study on the effects of debt financing on profitability of Commercial Banks in Ethiopia. For this purpose, sample of eight commercial banks secondary data and primary data over the study period of twelve years (2002-2013) were taken. In connection return on asset (ROA) to measure the profitability, debt to asset ratio, debt to equity ratio and interest coverage ratio as a measure the level of debt on the capital structure of the institution and control variable (firm size) were used. On the basis of findings using panel data analysis technique, the researcher documented that independent variables had a positive relationship with profitability and statistically a significant.

2.7. Empirical studies on banks profitability determinants

In this section, the empirical evidence on factors affecting bank profitability with a particular focus on those that have been conducted more recently is reviewed, as far as they are the best

indicators of the current situation. Determinants of bank profitability studies conducted in Ethiopia and studies carried out abroad.

Belayneh (2011) Study the impact bank-specific, industry-specific and macroeconomic determinants of Ethiopian commercial banks profitability. The study applied the balanced panel data of seven Ethiopian commercial banks that covers the period 2001- 2010. The paper used Ordinary Least Square (OLS) technique to investigate the impact of capital, size, loan, deposits, noninterest income, noninterest expense, credit risk (Bank Specific Determinants), market concentration (Industry specific Determinant), economic growth, inflation and saving interest rate (Macroeconomic Variables) on return on asset (ROA). The estimation results show that all bank-specific determinants, with the exception of saving a deposit, significantly affect commercial banks profitability in Ethiopia. Market concentration is also a significant determining factor in profitability. Finally, the study shows that economic growth was the only macroeconomic variables has a significant relationship with banks' profitability.

A research by Amdemikael (2012) to examines the bank-specific, industry-specific and macroeconomic factors affecting bank profitability for a total of eight commercial banks in Ethiopia, covering the period of 2000-2011. The study adopted a mixed methods research approach by combining documentary analysis and in-depth interviews. The findings of this study show that capital strength, income diversification, bank size, and GDP have statistically significant and positive relationship with banks' profitability. On the other hand, variables like operational efficiency and asset quality have a negative and statistically significant relationship with banks' profitability. However, the relationship between liquidity risk, concentration and inflation is found to be statistically insignificant. The study suggests that focusing and re-engineering the banks next to the key internal drivers could enhance the profitability as well as the performance of the commercial banks in Ethiopia.

A thesis paper conducted by Habtamu (2012) to investigate determinants of private commercial banks profitability in Ethiopia, by using panel data of seven private commercial banks from year 2002 to 2011 found that bank-specific factors such as; capital adequacy, managerial efficiency, bank size and macroeconomic factors; level of GDP, and regulation have a strong influence on the profitability of private commercial banks in Ethiopia.

Sori (2014) also in his thesis paper examined factors affecting the profitability of private commercial banks' in Ethiopia. This study adopted quantitative research approach and the

statistical cost accounting model. The finding of the study shows that loan and advance, current deposit, other liabilities, and GDP have statistically significant and positive relationship with banks' profitability. Contrary, variables like fixed deposit, market concentration have a negative and statistically significant relationship with banks' profitability. However, the relationship of deposit with other banks, the sum of investment, saving deposit and inflation is found to be statistically insignificant. Based on the finding the researcher recommended that private commercial banks should focus on increasing public awareness to mobilize more savings to enhance their performance in the provision of loans and advance to customers.

Besides Dawit (2017) consider bank specific, industry-specific and macroeconomic factors that determine the profitability of Ethiopian private commercial banks. For the purpose, the researcher used six private commercial banks were subject to the study ranging from 2004/2005 to 2014/2015. The panel analysis has been carried out to obtain the result for this empirical study. Supplementary the study used ROA as a Dependent variable and capital adequacy, operational efficiency, liquidity, income diversification, concentration, GDP, inflation and money supply as independent variables. This empirical investigation showed that capital, operational efficiency, income diversification, concentration and money supply have a significant relationship. Conversely liquidity, GDP and inflation have an insignificant relationship with the profitability of Ethiopian private commercial banks.

2.8. Conclusions and Research Gap

The concept of leverage, in general, is used in breakeven analysis and in the development of the capital structure of a business firm. Operating leverage refers to the percentage of fixed costs that a company has. Firms with high operating leverage are very sensitive to changes in sales and it affects their earnings before interest and tax quickly. Financial leverage refers to the amount of debt in the capital structure of the business firm. Investors in a business prefer the business to use debt financing but only up to a point. Beyond a certain point, investors get nervous about too much debt financing as it drives up the company's default risk.

A number of modern capital structure theories were developed following the publication of capital structure irrelevance framework by Miller (1958) they argued that a firm value couldn't change with changing its capital structure. A later study in 1963 by M&M concluded that by including corporate tax, the market value of the firm is increased and the overall cost of capital is reduced

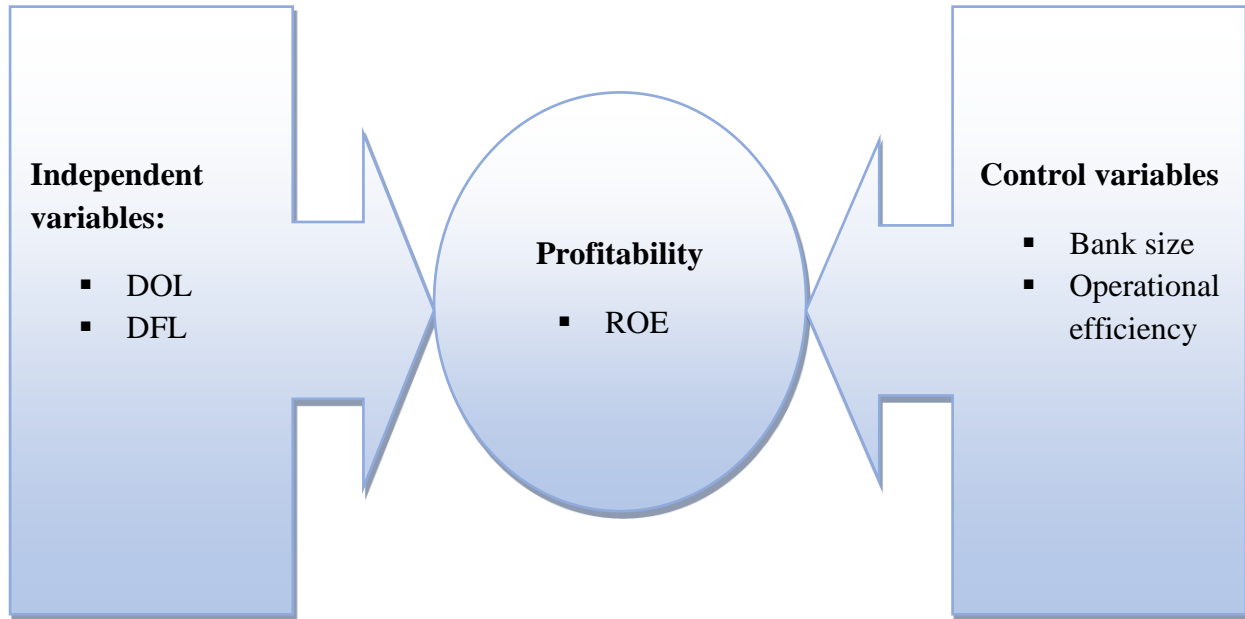
since interest is tax deductible expense (Miller, 1963). Those studies were conducted by undertaking different assumptions, which fit into the Particular situation. Trade-off theory, pecking-order theory, agency-theory and some other theories are empirical evidences that challenge Modigliani and Miller' capital structure studies in relation to these theories scholars postulate empirical tests.

Various empirical studies reviewed in this chapter have further revealed the opposing views of researchers on the issue of leverage and firms' performance. In Ethiopia, as far as the knowledge of the researcher is concerned, there are a few types of researches conducted about capital structure but those researchers have entirely emphasized on investigating determinants of capital structure and the impact of capital structure on firm's performance. Even though there were studies on capital structure and firms' profitability, all are focused on financial leverage (fixed charge financing instrument). Hence there is no empirical study in Ethiopia concerning the relationship between all types of leverage (operating and financial) and firm's performance in the context of the Ethiopian private banks'. Therefore, this study was address the knowledge gap on the effect of leverage on private commercial banks' profitability in Ethiopia.

2.9. Conceptual Framework

After carefully reviewed the theoretical and empirical literature those concentrated on leverage and firms' profitability, the following conceptual model is formulated to investigate the relationship between leverage and private commercial banks' profitability in Ethiopia.

Figure 2.5 Conceptual frame works



Source: researcher compilation from the literatures

The variables used to develop the above conceptual framework were in reference to: Zafar (2010); Habtamu (2012); Amdemikael (2012); Elangkumaran (2013) and Gatsi (2013).

Chapter Three

Research Methodology

3.1. Introduction

According to Kothari (2004), research methodology is a way to systematically solve the research problems. It is also a science of studying how research is conducted scientifically. This chapter introduces research design, the population of the study, Sample and sampling techniques, types and source of data, data collection method, methods of data analysis used in this study, variables and their measurement and finally model specification.

3.2. Research design and approach

As noted in Creswell (2009) research design is a plan or proposal to conduct research. It involves the intersection of philosophy, strategies of inquiry and specific methods. This study is an explanatory research. Besides, there are three types of research approach namely qualitative, quantitative and mixed approach. Even though, each approach has its own objective and application time, in the selection process one should take into account the nature of research problem or issues being addressed, the researchers' personal experience and the audience for whom the report presented. Therefore, in this study the quantitative research approach was used, since, quantitative nature of the data used.

3.3. Population of the Study

There are 18 banks, 17 insurance companies, and 35 micro-finance institutions operating in the financial sector under National Bank's supervision (NBE, 2016/17). The banking sector was considered under this study specifically all Ethiopian private commercial banks.

3.4. Sample and sampling technique

“Sampling is the process or technique of selecting a suitable sample for the purpose of determining parameters or characteristics of the whole population. To carry out a study, one might bear in mind what size the sample should be, and whether the size is statistically justified and lastly, what method of sampling is to be used” (John, 2007). Kothari (2004) also define sample as the selected respondents constitute the total population and sampling technique is the selection

process. As stated in NBE 2016/17 annual report from these 18 banks, only 17 banks are Commercial Banks (16 private and 1 public). This is excluding the Development Bank of Ethiopia which provides banking service to the selected priority sectors.

In line with balanced panel data, to meet the desired objective of this study and to make a generalization from sample to population, the researcher used a maximum combination of years and number of private commercial banks' and achieved the maximum number of observations through purposive sampling technique. Thus, private banks that operate less than nine years were excluded from the sample. Because of this, from 16 private commercial banks operating in the country this study takes sample of ten private commercial banks of which audited financial statements are available within the study period namely, Awash bank (AB), Dashen bank (DB), Bank of Abyssinia (BOA), Wegagen bank (WB), United bank (UB) and Nib international bank (NIB), Cooperative bank of Oromia (CBO), Lion international bank (LIB), Oromia international bank (OIB) and Zemen bank (ZB) for the period of 2008/2009 to 2016/2017.

According to NBE 2016/17 annual report, the sample private banks market shares from the sector in terms of branch network and capital account for 52.6 % and 28.3% respectively and their share from the total private sector in terms of branch network and capital account for 79% and 79.5% respectively. Besides this, they have good experience in the banking operation and the sample taken also 62.5 % of the total population of 16 private commercial banks in the country (see appendix I for detail). Hence, it is believed to make a generalization from sample to the population.

3.5. Types and Source of Data

As noted in Gujarati (2009) there are three types of data available for empirical analysis namely: time series, cross-section, and panel or pooled (i.e., a dimension of both time series and cross-section) data. The nature of data used in this study enables the researcher used panel data type. Hence, in this study balanced panel data (companies have the same number of observations) were used. Since panel data has the combination of both cross-sectional and time-series it is more useful data as it captures individual variability (cross-sectional information), and captures dynamic natures of the data (time-series information). And it ensures more variability, more degrees of freedom, more efficiency, and less collinearity among variables (Gujarati, 2009). According to

Saona, 2011 cited in Tamirat (2015) the main advantage of using panel data is that it allows overcoming of the unobservable, constant, and heterogeneous characteristics of each bank included in the study. Even though each has its own strength and limitation there are two sources of data namely: primary and secondary source (John Adams, 2007). In order to gather the required information which attains the research objectives, only secondary data (annual audited financial statements) were collected.

3.6. Data Collection Method

Once the research design including sampling plan formalized the coming phase is collect data. In this study, secondary data were used to meet the stated objectives. The audited financial statements for this study were gathered from national bank of Ethiopia for sampled private commercial banks within nine year's period from 2008/2009 up to 2016/2017.

3.7. Method of Data analysis

Data analysis is the coming task following the data collection. "The term analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data-groups" (Kothari, 2004). Hence, statistical techniques such as descriptive statistic and regression were performed to analyze the collected data. The descriptive statistic used to determine the minimum, maximum, mean and standard deviation. The regression analysis applies to find the causal relationship between leverage measures and profitability measure. For this purpose, Eviews 8 econometric software package was used.

Besides this, as noted in Brooks (2014) there are assumptions required to confirm that the ordinary least square (OLS) estimation technique and also hypothesis tests concerning the coefficient estimates could genuinely be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS have a number of desirable properties and are known as Best Linear Unbiased Estimators (BLUE). Therefore, diagnostic tests were performed to ensure whether the assumptions of the CLRM are violated or not in the model. Thus, the following section discusses the nature and significance of the model misspecification tests.

3.7.1. Test for Heteroscedasticity $\{E(u_i^2) = \sigma_i^2\}$

According to Brooks (2014), it has assumed that the variance of the error term is constant (homoscedastic). To test the presence of heteroscedasticity, one can use different detection methods. Like a graphic method, Goldfield–Quandt (1965) test, in this study the popular test white's (1980), general test for heteroscedasticity was employed. This test involves testing the variance of the errors is constant (homoscedasticity) or not. The formulated hypothesis for Heteroscedasticity test is:

H0: There is no Heteroscedasticity problem in the model.

H1: There is Heteroscedasticity problem in the model.

$\alpha = 0.05$

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

3.7.2. Test for Autocorrelation $\{cov(u_i, u_j) = 0 \text{ for } i \neq j\}$

There is an assumption that the errors are linearly independent of one another. If the errors are correlated with one another, it would be stated that they are auto correlated. To test the existence of autocorrelation, the Breusch–Godfrey test is a more general test for autocorrelation. Because, it allows examination of the relationship between error and several it's lagged values at the same time. If the test statistic exceeds the critical value from the chi-squared statistical tables, reject the null hypothesis of no autocorrelation. The formulated hypothesis for autocorrelation test is as follow:

H0: There is no autocorrelation problem in the model.

H1: There is autocorrelation problem in the model.

$\alpha = 0.05$

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

3.7.3. Test for Multicollinearity

The problem of multicollinearity usually arises when certain explanatory variables are highly correlated. To test the independence of the explanatory variables or to detect any multicollinearity problem in regression model the study used a correlation matrix of independent variables.

3.7.4. Test for Normality $\{u_t \sim N(0, \sigma^2)\}$

As noted in Brooks (2014) a normal distribution will thus have a coefficient of excess kurtosis of zero. One of the most commonly applied tests for normality is Bera-Jarque (1981) testing whether the coefficient of skewness and the coefficient of excess kurtosis are zero. BJ also states that, if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant at 5% significant level. The formulated hypothesis for normality test is as follow:

H0: Error term is normally distributed

H1: Error term is not normally distributed

$\alpha = 0.05$

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

3.8. Variables and Measurement

3.8.1. Dependent Variable (profitability measure)

This study examined the effect of leverage on private commercial banks profitability by using return on equity (ROE) as dependent variable or measure of profitability. The reason for choosing return on equity (ROE) as a proxy of financial performance is that it measures the rate of return for ownership interest (shareholder equity) of common stock owners or it also measures the efficiency of a firm at generating profits from each unit of shareholder equity (Donaldson, 1961). Besides, operating leverage influences the top half of statement of profit and loss and financial leverage influences the bottom half of statement of profit and loss. When the return on equity (ROE) breaks down into three parts: $ROE = \text{net income}/\text{equity}$

$$\frac{\text{Assets}}{\text{Equity}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Net income}}{\text{Sales}}$$

Leverage ratio * Asset turns over ratio * Operating profit margin

The product of asset turns over and operating profit margin is the return on assets (ROA). It depends on the firm's production and marketing skills and is unaffected by the firm's financing mix. However, the Leverage ratio depends on the debt-equity mix. When the firm is financed entirely by equity, the leverage ratio is one, and the return on equity is identical to the return on assets. If the firm borrows, however, the leverage ratio is greater than one (assets are greater than

equity). Thus, leverage can either increase or reduce the return on equity (Myers, 2001). Therefore, return on equity is preferable to measure of commercial banks performance. Return on equity (ROE) has been used as a proxy of financial performance measurement by Asrat (2016); Saxena (2016); Gatsi (2013) and Gweyi (2014) in their previous study. Return on equity (ROE) is calculated by the following formula:

$$ROE = \text{Net income after tax} / \text{Total equity}$$

3.8.2. Explanatory Variables

This subsection describes the independent variables in the econometric model to estimate the dependent variables. Following prior researchers towards the leverage and banks profitability, the independent variables are classified into leverage proxies and control variables. Moreover, these subsection present hypotheses, by offering the expected sign of the coefficients, based on academic literature.

3.8.2.1. Degree of operating leverage

Operating leverage means the extent to which fixed costs are used in a firm's operations. Operating leverage affects a firm's operating profit. Other factors held constant, a high degree of operating leverage, implies that a relatively small change in sales results in a large change in return on equity. Prior researchers used different measure of degree of operating leverage (DOL) for example: Gatsi (2013) used the ratio of percentage change in earnings before interest and tax (EBIT) to percentage change in the premiums received; Zafar (2010) ratio of contribution margin to earnings before interest and tax (EBIT) and another measure according to Elangkumaran (2013) the ratio of percentage change in earnings before interest and tax to percentage change in sales. For this study, the measurement by Elangkumaran (2013) is adopted with modification because it is more direct to the nature of the study.

$$DOL = \frac{\% \Delta EBIT}{\% \Delta \text{Total income}}$$

3.8.2.2. Degree of financial leverage

A company is described as levered if it is financed partly through debt simply because of the tax shield element of debt. But, debt carries a fixed financing cost, which means that if the company increases its debt the degree of financial leverage also increases (Gatsi, 2013). The degree of financial leverage is defined as the percentage change in earnings after interest and before taxes (EBIT) that results from a given percentage change in earnings before interest and taxes (EBIT). Based on previous literature, the degree of financial leverage of a company's computed in different ways. But, for the purpose, this study employed the ratio of earnings before interest and taxes (EBIT) to earnings before taxes (EBT) for calculating the degree of financial leverage (DFL). This mode of computation was used since; it focuses directly on the impact of interest on earnings before taxes.

$$DFL = EBIT/EBT$$

3.8.3. Control variables

There are a number of factors that affect the private commercial bank's profitability rather than leverage; this is the reason for control variables are including in the model. In this study, the researcher used explanatory factors those have a significant effect on commercial banks profitability under prior literature such as firm size and operational efficiency as a control variable.

3.8.3.1. Firm size

In most literature, the effect of size on banks profitability is positive and significant. Gatsi (2013) Used as a control variable in the study of the Degree of Financial and Operating Leverage and Profitability of Insurance Firms in Ghana. The researcher found that growth of profitability is positively associated with the size of the firm. In developing economies like Ethiopia, the impact of bank size on profitability is positive because it makes large banks capable of providing extended banking service for a large number of customers. Moreover, Belayneh (2011) indicated that larger banks enjoy the higher profit than smaller banks in Ethiopia banking sector because they are exploiting the benefit of economies of scale. In most previous studies, firm size is expressed by the logarithm of total assets. Total assets are defined as the sum of net fixed assets, total intangibles, net current assets, and other assets.

$$Bank\ Size = Ln(Total\ asset)$$

3.8.3.2. Operational efficiency

The cost to income ratio shows the overheads or costs of running the bank, including staff salaries and benefits, occupancy expenses and other expenses such as office supplies, as a percentage of income. It is used as an indicator of management's ability to control its expenses. It is also one of the key drivers of profitability that is examined. However, different authors try to use financial ratios of the financial statements to act as a proxy for management efficiencies such as Dawit (2017), Amdemikael (2012) and others. It expected to have a negative relation to profits, since improving the management of these expenses will increase efficiency and therefore raise profits (Dawit, 2017).

$$OEFI = \text{operating expense} / \text{Total income}$$

Table 3.2 Summaries of Variables, Measures and Expected Sign

Category	Variables	Measurement	Expected sign
Dependent	Return on equity	$ROE = NI / TotalEquity$	NA
Explanatory	Degree of operating leverage	$DOL = \% \Delta EBIT / \% \Delta Income$	+
	Degree of financial leverage	$DFL = EBIT / EBT$	-
Control	Bank size	$Ln(Total\ asset)$	+
	Operational efficiency	$OEFI = \text{operating expense} / \text{Total income}$	-

Source: researcher compilation

3.9. Model specification

To meet the objective of the study and to find out the impact of leverage on private commercial banks profitability in Ethiopia, the model used by (Gatsi, 2013) and (Patel, 2014) with some modification by including relevant variable is used. The modification is to include ROE as a dependent variable, bank size and operational efficiency were control variables. The general model is:

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

Where:

Y_{it} = is the dependent variable

α = Constant term

β = 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 impact of leverage on private commercial banks profitability examined using the model outlined below;

$$ROE_{it} = \alpha + \beta_1 DOL_{it} + \beta_2 DFL_{it} + \beta_3 OEF_{it} + \beta_4 LOG(size)_{it} + \mu_{it}$$

Source: develop by the researcher

Where:

ROE_{it} =Return on Equity for bank i in year t

α = Constant term

DOL_{it} =Degree of operating leverage for bank i in year t

DFL_{it} =Degree of financial leverage for bank i in year t

OEF_{it} = Cost to income ratio for bank i in year t

$Log(Size)_{it}$ =Log of Total asset for bank i in year t

μ_{it} =The error term

According to Brooks (2008), when omitting a relevant independent variable, including an unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. If the omitted variable is correlated with the included variable, the estimators are biased and inconsistent. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent. Ramsey RESET test was used to see whether the developed model is correctly regressing. To test this the following hypothesis is formulated:

H0: the model is correctly specified

H1: the model is not correctly specified

$\alpha = 0.05$

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

Chapter Four

Result and Discussion

In the preceding chapter, the research methodologies employed in this study were presented and discussed in detail. In this chapter, the collected data are presented, interpreted and analyzed using E-views 8. Therefore, the purpose of this chapter is to present results and analysis of data involved in the study. Accordingly, the descriptive statistics of all the variables used in this study and the results of hypothesis testing i.e. the estimated parameters of the regression equation, their significance, the connection between the independent variables and dependent variable according to the sign and the value of the parameters (coefficients) for the regression model are presented and discussed in detail. The current chapter has three sections. Under these sections in section 4.1 descriptive statistics of the dependent and independent variable followed by the diagnostic test for the classical linear regression model (CLRM) under section 4.2 were presented and the results of the regression analysis under section 4.3. Finally, discussion on regression output of dependent and independent variables in the models were presented in section 4.4.

4.1. Descriptive statistics

As clearly mentioned in the earlier chapter, in this study descriptive statistic used to determine minimum, maximum, mean and standard deviation. The following table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables for ten Ethiopian private commercial banks for the period of 9 years from year 2008/09-2016/2017 with a total of 90 but, after adjustment of 89 observations. This was generated to give an overall description of data used in the model.

Table 4.1 Summary of descriptive statistics of dependent and independent variables

	ROE	DOL	DFL	OEFI	LOG_SIZE
Mean	0.193965	0.800817	1.686401	0.407546	0.657940
Median	0.194121	0.897802	1.600573	0.370754	0.663306
Maximum	0.356701	4.589139	7.161982	2.115385	0.708199
Minimum	-0.100998	-5.678932	0.681904	0.202742	0.567100
Std. Dev.	0.076777	1.041727	0.699798	0.229958	0.028074
Observations	89	89	89	89	89

Source: E-views 8 output

As shown in chapter three, return on equity was used as a profitability measure of Ethiopian private commercial banks for this study. Which in turn calculated profit after tax divided by total equity. For the total sample, the mean value of return on equity was 19.4% with a minimum of -10.09% and a maximum of 35.67%. This indicates that sampled Ethiopian private commercial banks, generate the average return on equity of 19.4% during the study period. The most profitable banks earned 0.35 cents return from each unit of invested shareholder fund. On the other hand, the maximum loss incurred by sampled banks is -0.10 cents for each unit of invested shareholder fund. The standard deviation of return on equity (ROE) was 0.0767 this statistical measurement implies that the volatility of return on equity (ROE) from the mean value is 0.0667.

Regarding the explanatory variables, the descriptive statistics indicates that Ethiopian private commercial banks under the study period have a mean degree of operating leverage of 80.08% showing the ratio of percentage change in earnings before interest and tax (EBIT) to percentage change in total income, thus indicating on average a one unit change in total income produced 0.8 unit change in EBIT. DOL for sampled banks also ranged from -5.678932 to 4.589139. This show that banks with a high degree of operating leverage, the more its profits will vary with a given percent change in total income this tends to be associated with increasing systematic risk. DOL had the highest standard deviation (1.041727). Indicating that Degree of operating leverage shows highest fluctuating trend than other variables. It is found that the tendency of operating profit too enormous with higher income.

Again, it is indicative of above table, that the degree of financial leverage has higher mean value (1.686401) and is less volatile (0.699798) as compared to the degree of operating leverage. This means that for every change in earnings before taxes, on average there is a 1.686 times change in EBIT.

On the other hand, the operational efficiency (cost to income ratio) indicated by the range between 211.53% and 20.27%. The mean of operational efficiency equals 40.75%. The relatively higher range between the minimum and maximum value implies that the most efficient bank has a reasonably large cost advantage compared to the least efficient bank. Beside this, the maximum value indicates that at the initial stage of operation operating cost is high.

Likewise, bank size which is measured by the natural log of total asset had the average growth of 65.8%. The total assets growth for the sample banks in the study period were ranged from 56.71% to 70.82% with a standard deviation of 2.8%.

4.2. CLRM Assumptions and Diagnostic Test

In this study as mentioned in chapter three diagnostic tests were carried out to ensure that the data fits the basic assumptions of the classical linear regression model. Hence, the following subsections discuss the results of the diagnostic tests (i.e., heteroscedasticity, autocorrelation, multicollinearity, and normality test) and model specification test and Hausman test that ensure whether the data fits the basic assumptions of classical linear regression model or not.

4.2.1. Zero mean: $\{E(u_i) = 0\}$

According to Brook (2014), it required that the average value (mean) of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Since there is the constant term “ α ” in the regression model it could conclude that the mean value of the errors is zero.

4.2.2. Test for Heteroskedasticity $\{E(u_i^2) = \sigma_i^2\}$

The classical assumption required for the OLS estimator to be an effective state that, the variance of error term has to be constant and the same for all observers. This is referred to as a homoskedastic error term. When that assumption is violated and the variance is different for different observation we refer to this as Heteroskedasticity, If the assumption of constant variance is violated, the standard errors could be wrong and hence any inferences made could be misleading. In general, the OLS standard errors will be too large for the intercept when the errors are heteroscedastic. In order to test the following hypothesis White’s (1980) general test for heteroscedasticity was applied. The hypothesis for the Heteroskedasticity test was formulated as follow;

H0: There is no Heteroskedasticity problem in the model.

H1: There is Heteroskedasticity problem in the model.

$\alpha = 0.05$

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

Table 4.2 Result of Heteroskedasticity Test

Heteroskedasticity Test: White

F-statistic	0.859540	Prob. F(7,81)	0.5421
Obs*R-squared	6.153909	Prob. Chi-Square(7)	0.5219
Scaled explained SS	6.674690	Prob. Chi-Square(7)	0.4635

Source: E-views 8 output

As shown in table 4.2 all versions of the white test statistic (F-statistic, Chi-Square and Scaled explained SS) gave the same conclusion that there was no evidence for the presence of Heteroskedasticity, since the p-values of 0.5421, 0.5219 and 0.4635 for F-statistic, Chi-Square and Scaled explained SS respectively (see Appendix II for detail) were in excess of 5 percent level of significant, so the null hypothesis does not be rejected. This implies that there is no significant evidence for the presence of heteroskedasticity in this research model.

4.2.3. Test for Autocorrelation $\{cov(u_i, u_j) = 0 \text{ for } i \neq j\}$

It is assumed that the error terms are uncorrelated with one another. If the errors are not uncorrelated (correlated) with one another, it would be stated that they are ‘autocorrelated’ or that they are ‘serially correlated’. The consequences of ignoring autocorrelation when it is present are similar to those of ignoring heteroskedasticity. The coefficient estimates derived by using OLS are still unbiased, but they are inefficient, meaning that the standard errors are biased. Furthermore, the R square is likely to be inflated (Brooks C., 2014). Breusch– Godfrey tests allow examination of the relationship between error term and several of its lagged values at the same time. Therefore, to check the presence of autocorrelation in this study, the researcher used Breusch–Godfrey test.

The hypothesis for the autocorrelation test were formulated as follow:

H0: There is no autocorrelation problem in the model.

H1: There is autocorrelation problem in the model.

$\alpha = 0.05$

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

Table 4.3: Result of Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.610183	Prob. F(2,79)	0.2063
Obs*R-squared	3.485907	Prob. Chi-Square(2)	0.1750

Source: E-views 8 output

On the above table 4.3, autocorrelation test, E-views offer an F version and a χ^2 version, while the second table presents the estimates from the auxiliary regression (see Appendix III for detail). Initially, there was autocorrelation problem in this model. But, after remedy namely: Cochrane-Orcutt Iterative Procedure taken, the result enables to conclude from both versions of the test result in this case is do not reject the null hypothesis of no autocorrelation. Since the p-values of both F version and a χ^2 version 0.2063 and 0.1750 respectively were greater than significance level of 0.05. Thus, it can be concluded that there is no autocorrelation problem in the model.

4.2.4. Multicollinearity Test

Brooks C. (2014), states that when using the OLS estimation method the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change. However, in any practical context, the correlation between explanatory variables will be non-zero, although this will generally be relatively benign in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision.

There are two classes of multicollinearity: perfect multicollinearity and near multicollinearity. Perfect multicollinearity occurs when there is an exact relationship between two or more variables. It shows the regression model has difficulty in explaining which independent variables are affecting the dependent variable. If multicollinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped. Cooper & Schindler (2009) suggested that a correlation above 0.8 should be considered as a problem of multicollinearity. In addition, Hair (2006) concluded that correlation coefficient

below 0.9 may not cause serious multicollinearity problem. The correlation matrix between independent variables was used in this study to test the existence of multicollinearity problem.

Table 4.4 Correlation Matrix between independent variables

	DOL	DFL	OEFI	LOG_SIZE
DOL	1.000000			
DFL	0.222264	1.000000		
OEFI	-0.035315	0.021081	1.000000	
LOG_SIZE	0.141212	0.073078	-0.493489	1.000000

Source: E-views 8 output

As it is indicated in table 4.4 the result shows that there is no strong correlation between the explanatory variables. In this result, the highest correlation coefficient is 0.4934 between the log of the total asset (size) and operational efficiency. Thus, it can be concluded that almost all variables have low correlation power which implies no multicollinearity problem in the model.

4.2.5. Normality test (errors are normally distributed $\{u_t \sim N(0, \sigma^2)\}$)

According to Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped, and also a normal distribution will thus have a coefficient of excess kurtosis of zero. One of the most commonly applied tests for normality is the Bera-Jarque (BJ) test. When the p-value given at the bottom of the normality test screen greater than 5 percent do not reject the null hypothesis that the data is normally distributed. The hypothesis for the normality test was formulated as follow;

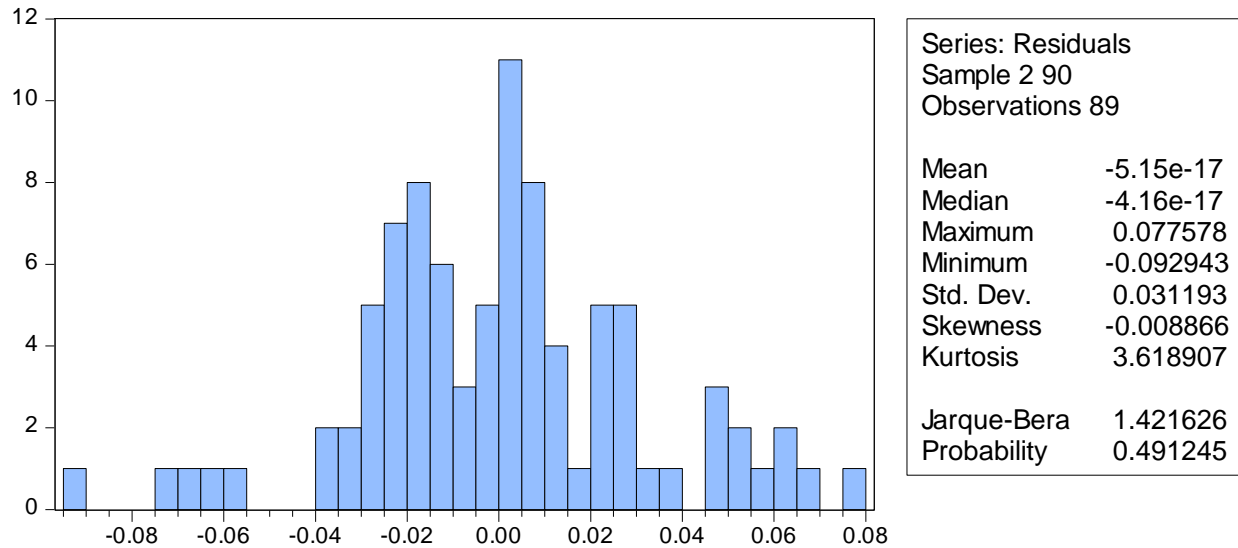
H0: the data is normally distributed.

H1: the data is not normally distributed.

$\alpha = 0.05$

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

Figure 4.1 Normality test result



Source: E-views 8 output

After the remedial measure taken namely make the outlier observation dummy the normality problem is fixed. As shown in the above figure 4.1 the Bera-Jarque statistic has a P-value of 0.491245 which implies that it is greater than 0.05. which indicates that there was no evidence for the presence of an abnormality in the data. Thus, the null hypothesis that the data is normally distributed should not be rejected since the p-value was in excess of 5 percent significance level. It can conclude that there is no problem of normality. Furthermore, it indicates that the inferences made about the population parameters from the sample parameters tend to be valid.

4.2.6. Model Specification test

The assumption of the CLRM that the econometric model used in the analysis is correctly specified has two meanings. One, there are no equation specification errors, and two, there are no model specification errors. The equation specification error is due to the omission of an important variable(s), the inclusion of unnecessary variable(s), adoption of the wrong function form, incorrect specification of the error term, and errors of measurement in the regressand and regressors. When appropriate variables are omitted from a model, the OLS estimators of the variables retained in the model are biased and inconsistent. Additionally, the variances and standard errors of these coefficients are incorrectly estimated. The consequences of including irrelevant variables in the model are also that the estimated variances tend to be larger than

necessary, thereby making for less precise estimation of the parameters. That is, the confidence intervals tend to be larger than necessary (Gujarati, D. 2009).

Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification. The hypothesis for the model specification test formulated as follow;

H0: The model specification is correct.

H1: The model specification is incorrect.

$\alpha = 0.05$

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

Table 4.5 Result of Model Specification Test

Ramsey RESET Test

Equation: UNTITLED

Specification: ROE C DOL DFL OEFI LOG_SIZE DUM34 DUM73 DUM74

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.708763	80	0.0914
F-statistic	2.919871	(1, 80)	0.0914
Likelihood ratio	3.190481	1	0.0741

Source: E-views 8 output

From table 4.5, it can be concluded that do not reject the null hypothesis (H0), that The model is correctly specified. Since, the p-values of t-statistics, F-statistics and likelihood ratio are 0.0914, 0.0914 and 0.0741 respectively (see Appendix IV for detail). Which are greater than significance level of 0.05. Thus, it can be concluded that the model is correctly specified.

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

There are broadly two classes of panel data estimator approaches that can be employed in empirical research: namely, fixed effects models and random effects model. According to Brooks C. (2014); it is often said that the random effect model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more plausible when the entities in the sample effectively constitute the entire

population. The question is which model is more appropriate fixed effect model or random effect model in this research models. In order to select the appropriate model, the researcher used Hausman test. The Hausman test that examines whether any unobserved omitted variables are uncorrelated with the included explanatory variables. If they are uncorrelated, a random effects approach can be used; otherwise, the fixed effects model is preferable. The null hypothesis for this test is that unobservable heterogeneity term is not correlated or random effect model is appropriate, with the independent variables. If the null hypothesis is rejected then we employ Fixed Effects method (Brooks C., 2014).

The Hausman test hypothesis is:

H0= Random effect model is appropriate

H1= Fixed effect model is appropriate

Table 4.6 Hausman test result

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.750350	4	0.6004

Source: E-views 8 output

According to above table 4.6 Hausman test shows, the P-value is 0.6004 (see Appendix V for detail), which is more than 5% level of significance. The conclusion from the above Hausman tests results is that the null hypothesis of the random effects does not reject at 5 percent significant level. This implies that for this research random effect model is more appropriate than fixed effect model.

4.3. Regression analysis results

To test the effect of leverage on Ethiopian private commercial banks profitability the following linear regression model was developed.

$$ROE_{it} = \alpha + \beta_1 DOL_{it} + \beta_2 DFL_{it} + \beta_3 OEFI_{it} + \beta_4 LOG(size)_{it} + \mu_{it}$$

Table 4.7 Regression output

Dependent Variable: ROE

Method: Panel EGLS (Cross-section random effects)

Date: 06/02/18 Time: 06:08

Sample: 2009 2017

Periods included: 9

Cross-sections included: 10

Total panel (unbalanced) observations: 89

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.039727	0.066502	0.597381	0.5519
DOL	0.004298	0.003179	1.352011	0.1801
DFL	-0.016850	0.004881	-3.452061	0.0009
OEFI	-0.350944	0.028608	-12.26748	0.0000
LOG_SIZE	0.433332	0.181296	2.390195	0.0192
DUM34	-0.119100	0.032221	-3.696314	0.0004
DUM73	0.412896	0.056958	7.249158	0.0000
DUM74	-0.211899	0.037749	-5.613309	0.0000

Effects Specification		S.D.	Rho
Cross-section random		0.000000	0.0000
Idiosyncratic random		0.031916	1.0000

Weighted Statistics			
R-squared	0.781728	Mean dependent var	0.103802
Adjusted R-squared	0.762864	S.D. dependent var	0.066766
S.E. of regression	0.032513	Sum squared resid	0.085623
F-statistic	41.44226	Durbin-Watson stat	1.611820
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.781728	Mean dependent var	0.103802
Sum squared resid	0.085623	Durbin-Watson stat	1.611820

Source: E-views 8 output

Note: at 5% Significant level

The developed model by Ordinary Least Square (OLS) model:

$$ROE = 0.039727 + 0.004298DOL - 0.016850DFL - 0.350944OEFI + 0.433332LOG_SIZE$$

The panel random effect estimation regression result in the above table 4.7 shows coefficient intercept (α) is 0.039727. This means, when all explanatory variables took a value of zero, the average value ROE would take 0.039727 unit and statistically insignificant at 5% of significance level.

The degree of operating leverage had a positive and statistically insignificant relationship with profitability (p-value = 0.1801) at 5% significance level. Whereas, the degree of financial leverage had a negative and strongly statistically significant relationship with profitability with a p-value of 0.0009 at 1% significance level. Moreover, regarding the control variables, the result shows that operational efficiency statistically significant (p-value = 0.0000) at 1% significance level and had a negative relationship with profitability. Similarly, banks size as measured by the logarithm of total asset statistically significant (p-value = 0.0192) at 5% significance level and had a positive relationship with profitability.

Besides, the adjusted R square was 76.11%. It indicates that the changes in the independent variables explain 76.28% of the changes in the dependent variable. That means the degree of operating leverage, the degree of financial leverage, operational efficiency and natural log of total asset collectively explain 76.28% of the changes in return on equity. While the remaining 23.72% of the change in independent variable is explained by other factors which are not included in this study model. In addition, the presence of dummy observation has a significant impact on profitability. Finally, the result also indicates that the regression F-statistic takes a value 41.44 with the p-value of zeros attached to the test statistic shows that the null hypothesis that all of the slope parameters are jointly zero should be rejected.

4.4. Summary of findings

The previous sections of the chapter presented the overall results of the study. Besides, this section also presents a discussion of the detail analyses of the results for each explanatory variables and their impact on private commercial banks profitability. Additionally, the discussion evaluates the statistical findings in relation to the previous theoretical and empirical evidence. Therefore, the following discussions present the relationship and impact of explanatory variables on profitability.

The degree of operating leverage (DOL)

From table 4.7, it can be observed that the coefficient of degree operating leverage which is measured by the percentage change in earnings before interest and tax (EBIT) divided by percentage change in total income ratio was the smallest positive coefficient (0.004298) as compared to other variables and a p-value of 0.1801. This shows that holding other things remain constant a 1 percent increase in the degree of operating leverage will result in 0.4 percent increased profitability, statistically insignificant at 5 percent significance level. The positive coefficient for degree of operating leverage implies that, whenever private commercial banks' increase the degree of operating leverage, they are faced with the situation of having to increase their profit the result in line with (Jensen, 1986; Larry et al., 1995 and Elangkumaran, 2013) but in contrast the empirical evidence Zafar (2010) Gatsi (2013).

The degree of financial leverage (DFL)

The empirical result shows that listed sampled private commercial banks' return on equity is negative and significantly associated with the degree of financial leverage. This implies that holding other things remain constant, a 1 percent increase in the degree of financial leverage leads to about 1.68 percent decline in profitability, as the estimated coefficient of the degree of financial leverage is about -0.016850. This result shows that debt financing has a negative impact on the profitability of the Ethiopian banking industry. Besides, the result revealed 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 result of this study is consistent with the pecking order theory which postulates a negative correlation between the profitability and the degree of the financial leverage (Myers (1984) and Myers and Majluf (1984)). Besides, a negative relationship between the degree of financial leverage and profitability was observed in the previous empirical studies, for example, Weldemikael (2012), (Gatsi, 2013), (Aragaw, 2015), (Edson, 2015) and (Taani, 2013). But it contrasts the empirical evidence by (Zubairi, 2010), (Gweyi, 2014).

Operational efficiency

The coefficient of the cost to total income ratio, which provides information on the management efficiency regarding expenses relative to total income, was negative and statistically strongly significant at 1 percent significance level (p-value= 0) with a negative coefficient (-35%). These

results imply that a one-birr increase in cost to total income ratio leads to 35 cents decrease in profitability. Which is in line with a prior expectation and makes the variable an important determinant of Ethiopian private commercial banks' profitability. This finding was consistent with many previous studies, e.g. Dawit, (2017), Sufian et.al, (2008) and Suzuki et.al, (2011). It can be Revealed that an increase (decrease) in these expenses reduces (increases) the profits of Ethiopian private commercial banks'. Hence, the increased efficiency i.e. reducing operating expense will result in higher profitability for the banks.

Total asset (Log Size)

The result reveals that banks size had a positive relationship with profitability, and statistically significant (p-value = 0.0192) at 5 percent significance level, and it was in accordance with the expected sign. This implies that holding other things remain constant, every 1 percent increase in the bank's size had a resulted 43.34 percent increase in profitability. The results also suggested that the bigger the bank, the more economies of scale and hence more profitable as well. The possible reason is that larger banks have economies 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), Tamirat (2015), and Gatsi (2013) were some of them. But, it contrasts the empirical evidence by Belayneh (2011),

Table 4.8 The Summary of expected and actual signs of explanatory variables

Explanatory variables	Expected impact	Actual impact
Degree of operating leverage	Positive and significance	Positive and insignificance
Degree of financial leverage	Negative and significance	Negative and significance
Operational efficiency	Negative and significance	Negative and significance
Log _size	Positive and significance	Positive and significance

Source: researcher compilation

Chapter Five

Conclusions and Recommendations

The previous chapter presented the analysis of the findings and discussions of the study. The purpose of this chapter is to discuss the conclusions and recommendations. Accordingly, this chapter is organized into two sub-sections. Section 5.1 presents the conclusions and section 5.2 presents the recommendations.

5.1. Conclusions

The broad objective of this study was to find the effect of leverage on Ethiopian private commercial banks profitability. The degree of leverage can be subdivided into financial and operating leverage. The degree of operating leverage estimates the extent to which an organization relies on fixed costs in its mission for maximizing its operating profit. While, the degree of financial leverage measures the extent to which debt finance which forms a component of the capital structure, contribute to the debt obligation of the private commercial banks.

Based on the review of previous empirical studies and theories, the present study investigated the effect of leverage on the profitability of Ethiopian Private commercial Banks over the period of 2008/09 to 2016/17 with a sample size of ten Ethiopian Private commercial Banks. The two major explanatory variables that were used in this study are - degree of operating leverage and degree of financial leverage. On the other hand, the study used other two control variables namely: - operational efficiency and natural log of a total asset from bank-specific factors. To comply with the objective of this research, the study used quantitative research method. The quantitative data were mainly obtained from the banks themselves and from National Bank of Ethiopia. Regression analysis (OLS) is adopted in order to identify and measure the effect of leverage on private banks profitability.

The regression analyses were made in line with the specific research objectives and stated hypotheses formulated in the study. Consequently, the empirical findings of this particular study suggested the following conclusions.

First, the findings indicated that Degree of operating leverage had a positive and statistically insignificant relationship with Ethiopian private commercial banks profitability. Which indicates

that the fixed operating costs incurred in the hope that produce income, the generated revenue is more than sufficient to cover all fixed and variable operating costs.

Second, the regression result between the degree of financial leverage and profitability showed a negative relationship with strong statistical significance. This shows that unfavorable or negative leverage is said to occur when the firm uses funds obtained by issuing debt at a fixed interest rate less than the fixed financing costs paid.

Lastly, with respect to the control variables, both variables i.e. operational efficiency and asset size were found to be a major factor of profitability in Ethiopian private commercial banks with 1% significance level respectively.

5.2. Recommendations

Based on the findings of the study the following possible recommendations were forwarded:

Based on the finding result, as long as the percentage change in EBIT resulting from a given percentage change in total income is less than the percentage change in total income, the degree of operating leverage is low. This small positive value for the degree of operating leverage indicates a relatively low business risk (i.e., low variability in operating profit) since changes in revenue will bring relatively small changes in operating profits. Hence, Ethiopian private commercial banks can increase income volume to dramatically improve profitability since they are operating above its breakeven point.

Results showed that financial leverage significantly affects the profitability of private commercial banks by reducing taxable income via interest payments. However, with reference to the trade-off theory of capital structure, management of banks should give due consideration to manage their debts in a way that reduce its negative impact on profitability and increase loan keeping the profitability of their loan portfolio in line with prescribed objectives and hence generate more interest income from the loan.

Operational efficiency is one of the key internal factors that determine the performance of private commercial banks in Ethiopia. So, the management would employ resources in ways that would yield higher benefits at least cost to still be profitable like portfolio diversification and new banking technologies.

Besides, the Ethiopian private commercial banks also recommended developing strategies that will increase bank size like increase branch expansion and manage efficiently taking in to account the economics of scale benefit of bank size.

Future Research Recommendation

During the course of this study several ideas and potential research areas have identified. This study examined the effect of leverage on Ethiopian private commercial banks' profitability. There is clearly enormous scope for more research that can inform an understanding of how is the leverage of firms, how it connects with the financial performance and which type of leverage make a difference. The purpose of this section is to serve as a source of motivation for further researchers who want to write research papers within this area of work. Therefore, it is recommended for future researchers to study the effect of leverage in different economic sectors.

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Appendices

Table3.1 Sampled private banks branch network (Number) and capital share (million)

S.No.	Banks	Establishment Year	No. of branch	Paid up Capital
1	Awash Bank S.C	1994	339	3,807.6
2	Dashen Bank S.C	1995	315	3,420.9
3	Bank Of Abyssinia S.C	1996	253	2,371.0
4	Wegagen Bank S.C	1997	223	2,824.5
5	United Bank S.C	1998	204	2,221.0
6	Nib International Bank S.C	1999	203	2,570.2
7	Cooperative bank of Oromia S.C	2004	287	1,281.7
8	Lion international bank S.C	2006	158	1,163.5
9	Oromia international bank S.C	2008	237	1,378.3
10	Zemen bank S.C	2008	22	1,050.7
Total		-	2241	22089.4
Percentage share from private total		-	79	79.5
Percentage share from sector		-	52.6	28.3

Source: NBE annual report 2016/17

Appendix II: Heteroskedasticity Test

Heteroskedasticity Test: White

F-statistic	0.859540	Prob. F(7,81)	0.5421
Obs*R-squared	6.153909	Prob. Chi-Square(7)	0.5219
Scaled explained SS	6.674690	Prob. Chi-Square(7)	0.4635

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 06/02/18 Time: 06:19

Sample: 2 90

Included observations: 89

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004970	0.001916	2.593353	0.0113
DOL^2	-1.53E-05	4.02E-05	-0.379494	0.7053
DFL^2	-6.12E-06	4.13E-05	-0.148270	0.8825
OEFI^2	-0.002633	0.001838	-1.432305	0.1559
LOG_SIZE^2	-0.029690	0.014526	-2.043868	0.0442
DUM34^2	-0.000752	0.001590	-0.473101	0.6374
DUM73^2	0.006706	0.006450	1.039694	0.3016
DUM74^2	-0.000987	0.001597	-0.618495	0.5380

R-squared	0.069145	Mean dependent var	0.000962
Adjusted R-squared	-0.011299	S.D. dependent var	0.001566
S.E. of regression	0.001575	Akaike info criterion	-9.984129
Sum squared resid	0.000201	Schwarz criterion	-9.760432
Log likelihood	452.2938	Hannan-Quinn criter.	-9.893963
F-statistic	0.859540	Durbin-Watson stat	1.955618
Prob(F-statistic)	0.542058		

Appendix III: Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.610183	Prob. F(2,79)	0.2063
Obs*R-squared	3.485907	Prob. Chi-Square(2)	0.1750

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 06/02/18 Time: 06:17

Sample: 2 90

Included observations: 89

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001187	0.067697	-0.017536	0.9861
DOL	0.000166	0.003224	0.051613	0.9590
DFL	-0.000189	0.004973	-0.038034	0.9698
OEFI	0.003510	0.029006	0.121020	0.9040
LOG_SIZE	0.000974	0.184377	0.005285	0.9958
DUM34	0.007709	0.033038	0.233345	0.8161
DUM73	-0.003373	0.057699	-0.058466	0.9535
DUM74	0.003400	0.038226	0.088947	0.9293
RESID(-1)	0.186868	0.114053	1.638426	0.1053
RESID(-2)	0.047988	0.116349	0.412451	0.6811

R-squared	0.039167	Mean dependent var	-5.15E-17
Adjusted R-squared	-0.070294	S.D. dependent var	0.031193
S.E. of regression	0.032270	Akaike info criterion	-3.923802
Sum squared resid	0.082269	Schwarz criterion	-3.644180
Log likelihood	184.6092	Hannan-Quinn criter.	-3.811095
F-statistic	0.357818	Durbin-Watson stat	1.974327
Prob(F-statistic)	0.951477		

Appendix IV: Ramsey RESET Test

Ramsey RESET Test

Equation: UNTITLED

Specification: ROE C DOL DFL OEFI LOG_SIZE DUM34 DUM73 DUM74

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.708763	80	0.0914
F-statistic	2.919871	(1, 80)	0.0914
Likelihood ratio	3.190481	1	0.0741

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.003015	1	0.003015
Restricted SSR	0.085623	81	0.001057
Unrestricted SSR	0.082607	80	0.001033
Unrestricted SSR	0.082607	80	0.001033

LR test summary:

	Value	df
Restricted LogL	182.8312	81
Unrestricted LogL	184.4264	80

Unrestricted Test Equation:

Dependent Variable: ROE

Method: Least Squares

Date: 06/02/18 Time: 06:20

Sample: 2 90

Included observations: 89

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.033702	0.079560	-0.423607	0.6730
DOL	0.004279	0.003201	1.336786	0.1851
DFL	-0.016332	0.004924	-3.316816	0.0014
OEFI	-0.319847	0.034071	-9.387786	0.0000
LOG_SIZE	0.583686	0.202634	2.880490	0.0051
DUM34	-0.109236	0.032951	-3.315144	0.0014
DUM73	0.376058	0.061265	6.138249	0.0000
DUM74	-0.186867	0.040732	-4.587689	0.0000
FITTED^2	0.893746	0.523037	1.708763	0.0914

R-squared	0.789414	Mean dependent var	0.103802
Adjusted R-squared	0.768355	S.D. dependent var	0.066766
S.E. of regression	0.032134	Akaike info criterion	-3.942167
Sum squared resid	0.082607	Schwarz criterion	-3.690507
Log likelihood	184.4264	Hannan-Quinn criter.	-3.840730

F-statistic	37.48645	Durbin-Watson stat	1.674447
Prob(F-statistic)	0.000000		

Appendix V: Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.750350	4	0.6004

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DOL	0.002879	0.003498	0.000001	0.4724
DFL	-0.028248	-0.026308	0.000002	0.1473
OEFI	-0.174275	-0.172338	0.000041	0.7634
LOG_SIZE	0.460231	0.507388	0.019559	0.7360

Cross-section random effects test equation:

Dependent Variable: ROE

Method: Panel Least Squares

Date: 06/02/18 Time: 06:06

Sample: 2009 2017

Periods included: 9

Cross-sections included: 10

Total panel (unbalanced) observations: 89

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003185	0.103112	0.030887	0.9754
DOL	0.002879	0.004483	0.642076	0.5228
DFL	-0.028248	0.006734	-4.195027	0.0001
OEFI	-0.174275	0.024319	-7.166190	0.0000
LOG_SIZE	0.460231	0.283604	1.622795	0.1088

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.623540	Mean dependent var	0.103802
Adjusted R-squared	0.558287	S.D. dependent var	0.066766
S.E. of regression	0.044373	Akaike info criterion	-3.248892
Sum squared resid	0.147675	Schwarz criterion	-2.857421
Log likelihood	158.5757	Hannan-Quinn criter.	-3.091101
F-statistic	9.555719	Durbin-Watson stat	1.993489
Prob(F-statistic)	0.000000		

Appendix VI: Ratio Data

FIRM	YEAR	ROE	DOL	DFL	OEFI	LOG_SIZE
AIB	2009	0.280894	0.951309	1.594108	0.324739	0.656883
	2010	0.258048	-1.165241	1.441583	0.263500	0.663690
	2011	0.269832	1.177031	1.414741	0.229645	0.669661
	2012	0.238953	0.715672	1.537006	0.265768	0.674540
	2013	0.212276	0.573673	1.622033	0.333891	0.683335
	2014	0.238075	1.073859	1.573803	0.321049	0.689634
	2015	0.202616	0.758858	1.741784	0.348074	0.693439
	2016	0.189044	0.785079	1.792882	0.374023	0.699562
DB	2009	0.274984	0.903521	1.565828	0.266632	0.665882
	2010	0.288457	1.013171	1.541594	0.255646	0.672786
	2011	0.322726	1.068086	1.516405	0.241757	0.677742
	2012	0.356701	1.055164	1.459250	0.233233	0.68292
	2013	0.296601	-0.009889	1.602603	0.273125	0.686367
	2014	0.274283	0.968483	1.598543	0.286363	0.689445
	2015	0.249371	0.379774	1.692347	0.346221	0.692921
	2016	0.216524	0.426714	1.779307	0.370526	0.697067
BOA	2009	0.193488	0.471417	1.770240	0.318461	0.649234
	2010	0.240110	1.619520	1.648422	0.441561	0.653195
	2011	0.273820	0.956690	1.633621	0.397989	0.657467
	2012	0.238604	1.044699	1.722333	0.311990	0.661060
	2013	0.239033	1.158779	1.734715	0.294764	0.667127
	2014	0.177055	0.553367	1.899346	0.340903	0.670145
	2015	0.158961	0.603216	1.991695	0.382984	0.675713
	2016	0.176415	0.741493	1.928962	0.424612	0.681736
WB	2009	0.215958	2.194846	1.325844	0.280899	0.647275
	2010	0.212357	0.801840	1.238536	0.304366	0.650604
	2011	0.241735	0.950663	1.218701	0.314877	0.660426
	2012	0.209230	-5.678932	1.305249	0.313149	0.661436
	2013	0.185781	0.194439	1.383339	0.335784	0.667785
	2014	0.148512	0.328508	1.556940	0.400992	0.664828
	2015	0.053730	0.662547	1.643402	0.418435	0.675805
	2016	0.050471	0.666632	1.715900	0.435854	0.680616
UB	2009	0.179982	0.738922	1.656443	0.358708	0.644511
	2010	0.273625	1.230394	1.421100	0.310762	0.651372
	2011	0.257198	1.396613	1.449054	0.248105	0.659195
	2012	0.270359	0.924612	1.488701	0.265470	0.662922
	2013	0.234741	0.300931	1.660977	0.314136	0.666626
	2014	0.176585	0.192504	1.770962	0.384766	0.671646
	2015	0.166832	0.583574	2.077085	0.434065	0.677145
	2016	0.163579	1.110057	2.227422	0.413519	0.682486

	2017	0.151737	0.879053	2.298917	0.422674	0.689367
NIB	2009	0.210832	0.962068	1.342400	0.308753	0.645455
	2010	0.219188	0.892083	1.314510	0.326244	0.651734
	2011	0.210511	1.312275	1.347073	0.294156	0.656798
	2012	0.187333	1.073727	1.390027	0.487142	0.661187
	2013	0.171837	0.338383	1.488540	0.555241	0.664077
	2014	0.159731	0.650961	1.554253	0.379710	0.668753
	2015	0.154812	0.919462	1.681701	0.386730	0.674828
	2016	0.154802	1.048130	1.797601	0.382145	0.679966
	2017	0.174825	1.026121	1.778761	0.377859	0.688175
CBO	2009	0.015069	-0.774974	4.317832	0.721732	0.600655
	2010	0.132793	2.380634	1.755845	0.50614	0.616502
	2011	0.192296	1.518452	1.630800	0.421183	0.626536
	2012	0.242087	1.356824	1.423849	0.345303	0.637650
	2013	0.271931	0.881911	1.257164	0.379138	0.654361
	2014	0.315534	1.138079	1.212174	0.345956	0.657754
	2015	0.221444	0.185081	1.285857	0.49558	0.670618
	2016	0.028645	4.589139	7.161982	0.752262	0.668425
	2017	0.136990	2.769877	2.403424	0.622487	0.683238
LIB	2009	0.013677	1.288342	1.302896	0.691996	0.598590
	2010	0.165263	0.340394	1.395297	0.370982	0.608979
	2011	0.123963	1.012830	1.439125	0.369266	0.617148
	2012	0.170711	1.127519	1.383273	0.340484	0.626098
	2013	0.205571	1.207469	1.370177	0.304817	0.631247
	2014	0.153836	-0.171325	1.581456	0.411936	0.637194
	2015	0.183155	0.749508	1.472913	0.480386	0.651190
	2016	0.183347	0.916803	1.596621	0.492748	0.660634
	2017	0.185286	1.836359	1.685936	0.432579	0.669363
OIB	2009	-0.028704	0.000000	0.935484	2.115385	0.567100
	2010	0.090680	-0.457593	1.707936	0.542276	0.603244
	2011	0.149869	1.574406	1.574553	0.417145	0.619511
	2012	0.112755	0.704790	1.850117	0.474309	0.629680
	2013	0.142567	0.827792	1.623827	0.502577	0.639488
	2014	0.206198	1.331625	1.494897	0.438465	0.652599
	2015	0.223377	0.845243	1.532820	0.469570	0.665288
	2016	0.188430	0.667513	1.728371	0.517168	0.670158
	2017	0.174228	0.912558	1.868132	0.526508	0.680800
ZB	2009	-0.100998	0.000000	0.681904	1.236575	0.577680
	2010	0.263888	-2.135967	1.380289	0.274721	0.601567
	2011	0.351915	1.421923	1.338992	0.215680	0.613859
	2012	0.307812	1.116364	1.536227	0.264586	0.625278
	2013	0.190777	0.354818	1.811902	0.202742	0.634112
	2014	0.194754	1.966747	1.695464	0.264269	0.639588
	2015	0.200398	2.032486	1.681809	0.327392	0.645861
	2016	0.202356	1.031642	1.765526	0.286042	0.657847
	2017	0.201264	0.977372	1.827050	0.267176	0.665692

