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DETERMINANTS OF COMMERCIAL BANKS' PERFORMANCE: AN EMPIRICAL STUDY ON ETHIOPIAN PRIVATE COMMERCIAL BANKS

BY

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ADDIS ABABA, ETHIOPIA

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A thesis submitted to The Department of project management for Partial Fulfillment of the Requirement of Degree of Master of Business Administration in project management

ADVISOR: - ASMAMAW GETIE (Asst. prof)

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Statement of Declaration

I, Melis Zeber Shikur, hereby declare that this thesis entitled “Determinants of Commercial Bank performance: An Empirical Study on Ethiopian Private Commercial Banks” submitted by me for the award of the degree of Master of MBA in project management, Saint Mary University at Addis Ababa, Ethiopia, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

Name: Melis Zeber Shikur

Signature: _____

Place: Addis Ababa

Date of Submission: June, 2018

ENDORSEMENT

This Masters thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

Advisor: Asmamaw Getie (Asst. prof)

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Date _____

St. Mary University

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This is to certify that the thesis entitled, "Determinants of commercial Bank performance: An Empirical Study on Private Commercial Banks' was carried out by Melis Zeber Shikur under the supervision of Asmamaw Getie (Asst.prof) and submitted in Partial Fulfillment of the Requirement for Master of Business Administration (MBA) in project management complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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List of Acronyms & Abbreviation

AIB	Awash International Bank
BoA	Bank of Abyssinia
BJ	Bera-Jarque
BLUE	Best Linear Unbiased Estimators
BS	Bank Size
BSD	Banking Sector Development
CAMEL	Capital adequacy, Asset quality, Management quality, earning quality, Liquidity
CPI	Consumer Price Index
CLRM	Classic Linear Regression Methods
EPRDF	Ethiopian People Revolutionary Democratic Front
FEM	Fixed Effect Model
GDP	Gross Domestic Product
GMM	Generalized Method of Moment
INFL	Inflation
ISHOPA	Imperial Savings and Home Ownership Public Association
ISHOPA	Imperial Savings and Home Ownership Public Association
LIQ	Liquidity
LOGTA	Logarithms of Total Asset
MGE	Management Efficiency
NBE	National Bank of Ethiopia
NIB	Nib International Bank
OLS	Ordinary Least Square
REM	Random Effect Model
RMP	Relative-Market-Power
ROA	Return on Asset
ROE	Return on Equity
SMCE	Saving and Mortgage Corporation of Ethiopia
UB	United Bank
WB	Wegagen Bank

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Abstract

This paper investigates the determinants of Ethiopian private commercial banks performance considering bank specific, industry specific and macroeconomic variables on six selected private commercial banks' ranging from 2001 to 2017. The bank's Audited financial statement and National Bank of Ethiopia has been the main source for the study and the panel analysis has been carried out to obtain the result for this empirical study. The fixed effect regression technique was used to estimate the model using the econometric package E-Views 8.The study used ROA as Dependent variable and Managerial efficiency, Bank Size, Financial Leverage, Number of Branches, Liquidity, Banking sector Development, GDP and inflation as independent variables. The study finds that Managerial Efficiency, Bank size and GDP have positive and significantly affect bank Profitability. On the other hand Number of Branches, liquidity and financial leverage has significant and inverse relationship with Private Bank's performance. However the result shows insignificant relationship between performance of Ethiopian private commercial banks with Banking sector development and inflation.

Keywords: Private Commercial Banks, bank Performance

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Financial institutions play a major role in oiling the wheel of growth in any economy of the world. They are financial intermediaries between end users of deposit and various investors Dereje (2015). Banks are one of the most important groups of financial intermediaries. The financial sector in Ethiopia is composed of the banking industry, insurance companies, microfinance institutions, saving and credit cooperatives and the informal financial sector (Zerayehu et.al 2013).

Banks play a vital role in economic development through engaging themselves in an intermediary role which enhances investment and growth. Bashir (2007) observes that commercial banks contribute positively to economic growth by channeling surplus funds to their most productive investment opportunities. The literature not only showed the greater function of banks in the economy but also stressed that without the existence of a sound and efficient banking system, the economy can't function well. When a bank fails, the whole of a nation's payment system is thrown in to jeopardy (Ikhide 2000, as cited in Tesfaye, 2014).

Banks also play key role in trade and payment system by significantly reducing transaction costs and increasing convenience. In less monetized countries, like Ethiopia, whilst financial sector is dominated by banking industry, effective and efficient functioning of the latter has significant role in accelerating economic growth (Zerayehu et al., 2013). To enhance the role of banks in an economy, profitability is an important driving force.

In order to survive in the long run identifying factors affecting performance is important for banks, because it helps to take initiatives to increases performance by managing the dominant determinants Evans (2014). The existence, growth and survival of a business organization mostly depend upon the profit which an organization is able to earn. The performance of the organization will definitely contribute to the economic development of the nation by way of providing additional employment and tax revenue to government exchequer (the fund of a government). Moreover, it

will contribute the income of the investors by having a higher dividend and thereby improve the standard of living of the people Samuel (2015).

Bank performance is also vitally important for all stakeholders, such as the owners, the investors, the debtors, the creditors, and the depositors, the managers of banks, the regulators and the government. The performance of banks gives directions to the stakeholders in their decision making Evans (2014).In the developed nations, financial markets and the banking system work in unison to achieve this main purpose. Unlike this, in the developing countries financial markets are usually underdeveloped and undersized so in that case the banks fill in the gap between borrowers and savers and provide the profitable and secure funds channeling Samuel (2015). Sustaining banks performance is very important for those underdeveloped countries. This is particularly true in the case of Ethiopia where no capital market exists. Banks are the main providers of funds, and their stability is of paramount importance to the financial system. As such, an understanding of determinants of their performance is essential and crucial to their stability.

In the developed nations, financial markets and the banking system work in unison to achieve this main purpose. Unlike this, in the developing countries financial markets are usually underdeveloped and undersized so in that case the banks fill in the gap between borrowers and savers and provide the profitable and secure funds channeling. Taking in to consideration that savings and investments are among the most important determinants of economic growth, the health of the general economy of a country is in a great way dependent on the well-functioning financial system. That is especially true for countries like Ethiopia, where the banking sector is the backbone of the economy. Abebaw and Kapur (2011) mention that ensuring the financial health of this institution is likely going to ensure the health of the performance of the financial system of the country. As Ethiopia is one of developing countries, the bank plays this role to fill the gap.

Moreover, Lelissa (2007) mentioned that the banking environment in Ethiopia has, for the past two decades, undergone many regulatory and financial reforms like other African countries and the rest of developing world. These reforms have brought about many structural changes in the

banking sector of the country and have also encouraged private banks to enter and expand their operations in the industry.

In addition to that according to Gemechu (2016) the banking industry has experienced some profound changes in recent decades, as innovations in technology and the inevitable forces driving globalization continue to create both opportunities for growth and challenges for banking managers to remain profitable in this increasingly competitive environment. Both internal and external factors have been affecting the profitability of banks over time. Hence, identification and analysis of the determinants of bank performance have attracted for many years the interest of academic researchers as well as bank management, supervisors and financial service participants.

Despite these changes, currently, the banking industry in Ethiopia is characterized by operational inefficiency, little and insufficient competition and perhaps can be distinguished by its market concentration towards the big government owned commercial bank and having undiversified ownership structure (Lelisa, 2007). The existence of less efficiency and little and insufficient competition in the country's banking industry is a clear indicator of relatively poor performance of the sector compared to the developed world financial institutions. Thus, it is important to study the determinants of banks performance for an efficient management of banking operations aimed at ensuring growth in profits and efficiency (Abera, 2012).

1.2. Statement of the problem

Recent data testifies that, the banking sector has experienced a trend of growing performance alongside positive trends related to balance sheet expansion. However, the contributing factors, whether internal or external, to increase their performance in the industry was not well analyzed (Abera, 2012). It is important therefore, to understand if the banking sector performance is being driven by factors related to the bank or are from external sources or both.

Moreover from various literatures Ethiopian banking industry is still at its infancy stage (Wubitu, 2012). In addition the access capital banking sector review for the 2010 fiscal year shows; the Ethiopian private commercial banking industry enjoyed high growth, high profits, and high

dividends. even though Ethiopian banks looks like good performance, lack of competition, limited number of branches, poor asset quality, low efficiency, higher levels of liquidity and others clearly indicate as they are still not performing well and attaining the maximum profit that they can achieve (Habtamu, 2012).

In Ethiopia, few studies have been made on the determinants of bank performance in case of private commercial banks, with varying types and numbers of variables taken into consideration. According to Belayneh (2011) analyzed determinants of bank performance in Ethiopia as whole by taking government as well as private banks in Ethiopia. He concluded that bank specific drivers have immense effect in explaining bank profitability. Besides, Abebaw and Kapuer (2011) concluded that capital strength, expense management, bank intermediation and bank sizes were the main determinants of Ethiopian bank profits covering the period of 2001-2008.Dawit (2017) also concluded that capital, operational efficiency, income diversification, concentration and money supply are the main determinants of Ethiopian private commercial banks profitability covering the period of 2005-2015.Moreover, the major findings of Melaku (2017) based on selected Private Banks data from 2001 to 2011, shows that bank specific determinants were very important in explaining profitability than external variables. Asset size, capitalization, labor productivity, liquidity and noninterest income were positively and significantly related to bank' s profitability, while credit risk and overhead efficiency have a negative impact on profitability of bank specific drivers. These varying results indicate that it needs further investigation to identify factors that determine the profitability of Ethiopian Private commercial Banks.

Therefore, the main purpose of this study was to analyze the financial data of Ethiopian private commercial banks from 2001 to 2017 in order to investigate the determinants of bank performance. To examine the relationship among measures such as Bank specific factors(managerial efficiency, liquidity, Financial leverage, bank size, Number of Branches(Branch expansion)), Industry specific (Banking Sector Development) and macroeconomic factors(Inflation and level of GDP) which measured by Return on Asset (ROA) by adding variables financial leverages a determinant of performance which are not included in previous study. Therefore, this study seeks to fill the gap by providing full information about the internal and external factors that affects private banks performance by examining the untouched

one, and replicating the existing in the Ethiopian context by using Private Commercial Banks operated in the country that had 17 years data.

1.3.Objective of the Study

1.3.1. General Objective

The main objective of this study is to identify the bank specific, industry specific and macroeconomic determinants of performance in Ethiopian Private Commercial Banks.

1.3.2. Specific Objectives

The specific objectives of the study are:

- To examine how bank specific factors (Bank size, Number of Branches, liquidity, financial leverage and managerial efficiency) affect Ethiopian private commercial banks performance
- To identify the effect of industry specific factor i.e. Banking sector development on private commercial banks performance.
- To assess the impact of macroeconomic factors like growth in gross domestic product (GDP) and inflation on private commercial banks performance.

1.4. Significance of the Study

The main objective of this study is to identify the internal and external factors that influence performance of Private Commercial Banks in Ethiopia and expected to provide empirical evidence on the performance of Private Commercial banks in Ethiopia.

Hence, this research may have significant role to play in shading light on how to better understand what determines financial institutions' particularly Private Commercial banks performance in Ethiopia. Furthermore, this study will be important in providing a better ground for bank managers, business professionals, business initiatives and policy makers. Moreover, the researcher also contributes that this study would be a stepping stone for further research in the area.

1.5. Hypothesis of the study

Hypothesis of the study stand on empirical findings related to bank's performance that has been developed over the years by banking area researchers. Therefore, the followings three general research hypotheses about the determinants of bank performance are formulated based on theories and past empirical studies related to bank's performance.

***HO1*:** Bank specific factors significantly (Financial Leverage, Liquidity, Managerial efficiency, Bank size, number of Branches) affect bank performance

***HO2*:** Industry specific drivers (Banking sector development) not significantly affect bank performance

***HO3*:** Macroeconomic factors (GDP and Inflation) significantly affect bank performance

1.6. Scope and Limitation of the Study

The scope of the study was bound on the effect of bank specific, industry specific and macroeconomic factors on the performance of selected private commercial banks in Ethiopia over the year 2001 to 2017 and banks included only establish before 2001.

The study used more of financial related variables than that of non-financial measure variables which may have influence and might need a further investigation. Financial reports within seventeen years may be affected by different non modeled variables in the state of the economy. The other limitation of the study is samples taken based on the age of the banks. This might fail to measure the actual effects of the internal and external determinants of performance of private banks.

1.7.Organization of the paper

The paper organized under five chapters. The first chapter deals with the introduction part which contains introduction, statement of the problem, objective, scope and limitation of the study. The second chapter includes both theoretical and empirical reviews. The third chapter covers methodologies and model specification of the study. The fourth chapter is about data analysis. The final chapter, which is Chapter five, was designed to provide conclusion and recommendation based on the study obtained from analysis.

CHAPTER TWO

2. LITRATURE REVIEW

From the literature, the determinants of bank performance are divided into two: those which can be controlled by the management, and those which are beyond the control of bank management. The factors that can be controlled by the management are called internal factors while those outside their control are called external factors. The internal determinants of bank performance reflect the banks` management policies and decisions made on sources and uses of funds, capital, liquidity management and expenses management. This information is usually available on the bank`s balance sheet and in the profit and loss accounts.

Financial performance shows that entire performance of the company due to its various business and operating activities. However profitability shows financial performance related to profit or loses of the business activities. Performance is the accomplishment of a given task measured against preset known standards of accuracy, completeness, cost, and speed. In a contract, performance is deemed to be the fulfillment of an obligation, in a manner that releases the performer from all liabilities under the contract (Andebet, 2016). Bank performance is described in the capacity to generate sustainable profit (European central Bank, 2010).

The external determinants both industry-related and macroeconomic variables, they are not related to bank management but reflect the economic and legal environment that affect the operation and performance of banks. Globally many researches are conducted to identify internal and external determinants of Bank performance. However, few researches are conducted in Ethiopia.

2.1.Overview of banking history in Ethiopia

The history of the use of modern money in Ethiopia can be traced back more than 2000 years. It flourished in the Axumite era which ran from 1000 BC to around AD 975. Leaving that long history aside modern banking in Ethiopia started in 1905 with the establishment of Abyssinia Bank which was based on a fifty year agreement with the Anglo- Egyptian National Bank Alemayehu (2006). The agreement that was reached in 1905 between Emperor Minilik II and Gillivray, representative of the British owned National Bank of Egypt marked the introduction of

modern banking in Ethiopia. Following the agreement, the first bank called Bank of Abyssinia was inaugurated in Feb.16, 1906 by Emperor Minilik II. The Bank was totally managed by the Egyptian National Bank Samuel (2015).

In 1908 a new development Bank (called society Nationale De'Ethiope Pour le Development d'l Agriculture et du commerce) and two other foreign Banks (Banque de l'Indochine and the Compagnie de l'Afrique Orientale) were established (Pankrust1968, cited in Alemayehu, 2006).

Generally, in its short period of existence, Bank of Abyssinia had been carrying out limited business such as keeping government accounts, some export financing and undertaking various tasks for the government. Moreover, the Bank faced enormous pressure for being inefficient and purely profit motivated and reached an agreement to abandon its operation and be liquidated in order to disengage banking from foreign control and to make the institution responsible to Ethiopia's credit needs. Thus by 1931 Bank of Abyssinia was legally replaced by Bank of Ethiopia shortly after Emperor Haile Selassie came to power.

According to Mersea'hazen W/kirkos (2009 EC) after a long discussion with the Bank (bank of Abyssinia) the government bought the share and changed the name to Ethiopian Bank and inaugurated in Oct 1 1931 by the Emperor Haile Selassie. To run the operation smoothly, the emperor formulates an advisory committee which contains high level government officials and foreign professionals. The committee members are Bejirond (Minster of Finance) Teklehawariyat T/mariam, Fitawrary Tafesse H/micheal, Mekonnen H/Wold, Sahile Tsedalu, Muse Kolson**,** Muse Colior and Muse Kiworkof**.**

According to NBE 2009/2010 annual report, the newly Bank called Bank of Ethiopia, was a purely Ethiopian institution and was the first indigenous Bank in Africa and established by an official decree on August 29, 1931. The transfer of ownership took place very smoothly and the offices and personnel of the Bank of Abyssinia including its manager, Mr. Collier, being retained by the new Bank. Ethiopian government owned 60 percent of the total shares of the Bank and all transactions were subject to scrutiny by its Minister of Finance

After nearly thirteen years operation according to Abreh (2015) in 1943 the Ethiopian government has established its own bank called State Bank of Ethiopia, which was serving both

the commercial bank and central bank activities. Later on it is further dissolved into today‘s National Bank of Ethiopia (NBE) and Commercial Bank of Ethiopia (CBE).

The State Bank of Ethiopia had established 21 branches including a branch in Khartoum, Sudan and a transit office on Djibouti until it ceased to exist by bank proclamation issued on December, 1963. Then the Ethiopian Monetary and Banking law that came into force in 1963 separated the function of commercial and central banking creating National Bank of Ethiopia (NBE) and commercial Bank of Ethiopia (CBE). Moreover it allowed foreign banks to operate in Ethiopia limiting their maximum ownership to be 49 percent while the remaining balance should be owned by Ethiopians.

After the Ethiopian Monetary and Banking law that came into force in 1963 the first privately owned bank, Addis Ababa Bank S.C., was established on Ethiopians initiative and started operation in 1964 with a capital of 2 million in association with National and Grindlay Bank London, which had 40 percent of the total share. There were other financial institutions operating in the country like the Imperial Savings and Home Ownership Public Association (ISHOPA) and saving and Mortgage Corporation of Ethiopia (SMCE). But following the declaration of socialism in 1974 the government extended its control over the whole economy and nationalized all large corporations.

In Ethiopia, during the pre-1975 imperial era, there had few banks (dominated by foreign ownership) and the absorptive capacity of the economy was too low even to accommodate moderate competition. In the Derg regime (1975-1991), private banks were fully nationalized and left no room for competition.

Following the fall of the Dergue regime in 1991 that ruled the country for 17 years under the rule of command economy, the EPRDF declared a liberal economy system. In line with this, Monetary and Banking proclamation of 1994 established the National Bank of Ethiopia as a judicial entity, separated from the government and outlined its main function. Monetary and Banking proclamation No.83/1994 and the Licensing and Supervision of Banking Business No.84/1994 laid down the legal basis for investment in the banking sector. Consequently after the proclamation issued private equity holders began to join the Ethiopian banking industry Samuel (2015).

According to Abebaw and Kuper (2011) the Ethiopian banking sector remains isolated from the impact of globalization. The government believes that liberalization may result in loss of control over the economy and may not be economically beneficial. Ethiopia has no capital market and investing in shares of private companies is limited. A series of financial sector reforms has been introduced since 1994, after private banks were allowed to operate. But, the state-owned bank, Commercial bank of Ethiopia continues to dominate the market in terms of capital, deposit, profit and assets.

After 1994 private commercial banks plays major role in Ethiopian economy. Their number and market share was growing from time to time. Following the Proclamation of Licensing and Supervision of Banking Business Proclamation No. 83/1994 and 84/1994, Awash International Bank S.C was registered as the first private commercial bank in modern Ethiopia banking business. So far currently 16 private commercial banks are operating in the country. The following table contains list of private commercial banks, their year of establishment and number of Branches.

Table 2.1. List of private commercial banks

Sr .No.	Name of the Bank	Year Established
1	Awash Bank S.C	1994
2	Dashen Bank S.C	1996
3	Bank of Abyssinia S.C	1996
4	Wegagen Bank S.C	1997
5	United Bank S.C	1998
6	NIB International Bank S.C	1999
7	Cooperative Bank of Oromia	2005
8	Lion International Bank S.C	2006
9	Oromia International Bank S.C	2008
10	Zemen Bank	2009
11	Buna International Bank S.C	2009
12	Berhan International Bank S.C	2010
13	Abay Bank S.C	2010
14	Addis International Bank S.C	2011
15	Debub Global Bank S.C	2012
16	Enat Bank	2013

Source:-National Bank of Ethiopia Annual report 2016/2017.

2.2.Theoretical literature on Banks' performance

2.2.1. Market-Power Hypotheses of bank performance

A more organized study of bank performance started in the late 1980's Olweny and Shipho (2011) with the application of Market Power (MP) and Efficiency Structure (ES) theories (Athanasoglou et al., 2005). The MP theory states that increased external market forces results into profit. Moreover, the hypothesis suggest that only firms with large market share and well differentiated portfolio (product) can win their competitors and earn monopolistic profit. The market power hypothesis asserts that increased market power yields monopoly profits. A special case of the MP hypothesis is the Relative-Market-Power (RMP) hypothesis; this suggests that if a bank intends to increase its profits by increasing leverage, the equity to asset ratio (capital) has to be reduced.

Other theories that suggest the determinants of bank profitability are the Market Power and Efficiency Structure theories. Market Power suggests that performance of banks is determined by market structure of the industry. The Efficiency Theory argues that banks earn more profits because they are more efficient in their operations than their competitors OLweny and Shipo (2011), which leads to low operational costs and high profits Zouari (2010).

2.2.2. Signaling theory, bankruptcy cost hypothesis and risk-return hypothesis.

The relationship between capital and profitability is explained by signaling theory, bankruptcy cost hypothesis and risk-return hypothesis. The signaling theory put forth that firms that is most profitable provide the market with more and better information. According to Ommeren (2011), the signaling theory suggests that a higher capital is a positive signal to the market value of a bank. Lower leverage indicates that banks perform better than their competitors who cannot raise their equity without further deteriorating the profitability. On the other hand, bankruptcy cost hypothesis argues that where bankruptcy costs are unexpectedly high, a bank holds more equity to avoid period of distress Berger (1995).

The signaling theory and bankruptcy cost hypothesis support a positive relationship between capital and profitability. The risk-return hypothesis suggests that increasing risks, by increasing leverage of the firm leads to higher expected returns. However, if a bank expects increased returns (profitability) and takes up more risks, by increasing leverage, the equity to asset ratio

(capital) will be reduced. Risk-return hypothesis revealed a negative relationship between capital and profitability Sharma and Gounder (2012).

Consequently, the Market Power (MP) and Efficiency Structure (ES) theories explain the relationship between the bank size and profitability. Olweny and Shipho (2011) observed that the market power posits that performance of banks is influenced by the market structure of the industry and that the Efficiency Structure hypothesis maintains that banks earn high profits because they are more efficient than the others. Olweny and Shipho (2011) argue that MP theory assumes that the profitability of a bank is a function of external market factors, while ES assume that profitability is influenced by internal efficiencies.

2.2.3. Efficiency Hypothesis

A theoretical attempt to offer an alternative explanation on the market Structure Conduct Performance (SCP) relationship was first made by Demsetz (1973) who also proposed the Efficiency Hypothesis. He stated that higher profits of banks are not due to their collusive behavior but because of high efficiency level, which in turn, leads to larger market shares that banks possess. In other words, profitability of bank is determined not by the market concentration but by bank efficiency Grygorenko (2009).

This hypothesis stipulates that a bank which operates more efficiently than its competitors gains higher profits resulting from low operational costs. The same bank holds an important share of the market. Consequently, differences at the level of efficiency create an unequal distribution of positions within the market and an intense concentration Mensi and Zouari(2010).

On the other hand, Rhoades (1985) doubted the conclusion that the positive relation between market share and profitability was due to efficiency. He stated that this pattern might occur because of product diversification and correspondingly, ability of some banks to set higher prices on their services. According to Grygorenko (2009), further empirical investigations did not bring clarification to the issue as to which of the theories mentioned above is best in explaining bank profitability: (Ahmad and Haron (1998) and Yu and Neus (2005) confirmed Structure-Conduct-Performance (SCP) theory, while Mamatzakis C and Remoundos (2003) and Naceur (2003) found evidence for Efficient-Structure Hypothesis as cited in Melaku2017).

2.2.4. **Modern monetary theory (MMT)**

Modern monetary theory explains exclusively how the government, central bank and the commercial banking sector interacts, with some economists arguing that understanding of reserve accounting is critical to understanding monetary policy options. This theory was developed by a group of economist including Randal Wray (2009). All of the commercial banks will also have an account with the central bank.

This permits the banks to manage their reserves that is, the amount of available short-term money that a particular bank holds. So when the government spends, treasury will debit its cash operating account at the central bank, and deposit this money into private bank accounts (and hence into the commercial banking system). This money adds to the total reserves of the commercial bank sector. MMT argues that taxes and bond offerings are not best conceptualized as funding sources for the Treasury, but rather as reserve draining devices to maintain price and interest-rate stability Tymoigne (2013).

2.2.5. Inverted U-curve theory

The inverted U-curve theory suggests that profitability will first rise as the bank size increases, eventually level-off overtime, and then begin to fall as the bank becomes extremely large. A large financial institution can contract with a huge number of borrowers which results in diversification which further reduces the anticipated cost of overcoming information asymmetries. This results in cost savings which leads to higher profits. In other words, a large bank will be able to take advantage of economies of scale. The counter argument is that as the bank becomes too large, profits will start to fall because of bureaucratic reasons thus exhibiting a nonlinear relationship Paula Kibathi (2014).

2.3. Determinants of commercial bank performance

Determinants of commercial bank performance can be split between those that are internal and those that are external. Internal determinants of bank performance can be defined as those factors that are influenced by the bank's management decisions and policy objectives Staikouras and Wood (2002). External determinants of commercial bank performance are concerned with those factors which are not influenced by specific banks decisions and policies, but by events outside

the influence of the bank. Several external determinants are included separately in the performance examination to isolate their influence from that of bank structure so the impact of the formers on profitability may be more clearly discerned Eliona (2013).

2.3.1. The Internal Determinant

Internal determinants of bank performance can be defined as factors that are influenced by a bank's management decisions. More precisely, the internal factors are bank specific variables which influence the performance of specific bank (Al-Tamimi 2010; Aburime2005).

2.3.1.1.Management Efficiency

Management Efficiency is one of the key internal factors that determine the bank performance but appears to be one of the complexes subject to capture with financial ratios Ongore (2013). However, different authors try to use financial ratios of the financial statements to act as a proxy for management efficiency. One of these ratios used to measure management quality is operating profit to income ratio (Rahman et al., 2009; Sangmi and Nazir, 2010). However, some used the ratio of costs to total assets Nassreddine (2013). In whatever way the argument goes measuring the management efficiency requires to get deep into evaluation of the management systems, organizational discipline, control systems, quality of staff, and others. In the Ethiopian context the regulatory organ considers all the aforesaid variables. Hence, a single quantitative measure of the management performances not set Tesfaye (2016).

Moreover, operational efficiency in managing the operating expenses is another dimension for management efficiency. The capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by financial ratios. As (Indranarain 2009; Bourke 1989 and Molyneux and Thornton 1992; cited in Samuel 2015) the ratios of operating expenses to operating income and operating expenses to total assets are commonly used to measure Managerial efficiency of the banks. Operating expense to operating income and stated that Higher the efficiency level of a bank, higher its profits level. Hence a positive relationship is expected between efficiency and profitability of banks.

2.3.1.2. Liquidity

Liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner. There are variations among scholars with regard to the measurement ratios. The most common financial ratios that reflect the liquidity position of a bank according to Samad (2004) are customer deposit to total asset and total loan to customer deposits. Other scholars use different financial ratio to measure liquidity. For instance Ilhomovich (2009) used cash to deposit ratio to measure the liquidity level of banks in Malaysia

The managers of commercial banks must take refers to the liquidity management and specifically the ability of an organization to meet its obligations and the solvency of organization. It indicates the percentage of bank's loans funded through deposits. The ratio of bank's advances to deposits is used as a measure of liquidity. (Al-Qudahet.al. (2013) discovered that negative relationship exists between the level of liquidity and profitability. However, Samad (2015) found a significant positive relationship between liquidity and bank profitability. Thus the relationship between liquidity and profitability is indeterminate.

Étienne and Christopher (2010) analyzed that the impact of liquid asset holdings on bank profitability for a sample of large U.S. and Canadian banks. Results suggest that profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a banks' profitability, all else equal. Moreover, empirical evidence also suggests that this relationship varies depending on a bank's business model and the state of the economy.

2.3.1.3. Bank Size

As Habtamu (2012) cited (Civelic and Al-Alami 1991, Smirlock,1 985) Bank size measured by total assets or total deposits is one of the control variables used in analyzing performance of the bank system. This is included to control for the possibility that large banks are likely to have greater product and loan diversification. The impact of bank size on profitability is uncertain a prior for the fact that on the one hand, increased diversification implies less risk and hence a lower required return, and on the other hand, bank size takes into account differences brought about by size such as economies of scale. For large firms their size permits them to bargain more

effectively, administer prices and in the end realize significant higher prices for the particular product.

In addition to that, according to Belayneh (2011) one of the most important questions regarding bank profitability is whether or not bank size optimizes profitability. Generally, the effect of size on profitability is expected to be positive to a certain extent. However, for banks that become extremely large, the effect of size could be negative due to bureaucracy and other reasons. Hence, the size-profitability relationship may be expected to be nonlinear and the study also used the banks' logarithm of total assets in order to capture the possible non-linear relationship and to remove the scale effect.

The other researchers (Athanasoglou et al., 2008) suggest that in general the effect of a growing size on profitability has proven to bepositive to a certain extent. Dr. Rajesh K. Singh and S. Chaudhary (2009), and Devinaga Rasiah (2010) also agree on their result. In this respect, (Goddard et al., 2004) supported their arguments on economies of scale and showed that, at small asset sizes, banks can take advantage of economies of scale, but they become exhausted as the size of their assets increases Paolo Saona(2016).

2.3.1.4. Financial Leverage

Leverage means magnification of either profits or losses. Leverage represents metrics tool to determine the possibility of the inability of the firm to pay its debts, particularly in the long term. Therefore, the increase in financial leverage increases the possibility of the firm's exposure to non-financial solvency and bankruptcy. According to (Baggs and Brander 2005; Faulkender and Mitchell 2004 and Seppa, 2008) Leverage measured by total Liability to total assets (TL/TA).

In spite of the importance of using debt in the financing structure because the debt interest achieved a tax shed advantage for the company, but they may cause a conflict of interests of creditors and owners, since creditors are looking for low-risk investments while investors are looking for profitable investments. Financial leverage happened when an organization uses short or long term debt to magnify profits (Booth & Seen Clearly, 2008 cited in Ali Mustafa Al-Qudah1et.al, 2013).

The authors choose in this research paper to use the debt to assets ratio as a measurement of financial leverage. According to Pareja (2010) financial leverage is the degree to which a company uses fixed items, such as debt and preferred equity. A high degree of financial leverage implies high interest payments.

2.3.1.5.Number of Branches

Currently NBE urges private commercial banks to expand their branches in cities and rural areas around the country. According to Erna and Eki (2004) banks usually makes decisions on expanding their branch by considering different factors. Some of the factors could be; level of competition, deposit potential, regional income and existence of road and vehicles. There is a trend of high expansion on the commercial banks in Ethiopia being witnessed in recent years. So, in this paper we will try to analyze whether this expansion and previous expansions has any effect on profitability

According to Dr. Devinaga Rasiah (2010), numbers of branches are one of the explanatory variables in his profitability study. The study found that the number of branches had no effect on profitability and also it can be captured by other variables such as the amount of deposit received or the amount of loan provided.

Beverly (2005), assessed the implications of these developments by examining a series of simple branch performance measures and asking how these measures vary. His finding suggest that banks with mid-sized branch networks may be at a competitive disadvantage in branching activities and find no systematic relationship between branch network size and overall institutional profitability. This may be because banking organizations optimize the size of their branch network operations as part of an overall strategy involving both branch-based and non-branch-based activities. He used cross-sectional data and descriptive method of analysis using mean and median of variables to compare across branches.

Kozo and Kazumine (2011) paper to investigate the effects of branch expansion on cost and profit efficiency for the Japanese regional banks over the period of fiscal year 1999-2009with regard to performance measures using stochastic frontier analysis .They found that focusing on

the local activities without expanding branch network is associated with improved cost efficiency even though regional banks expanding branch network in certain level exhibit higher cost efficiency whereas excessive branch expansion causes lower cost efficiency. In contrast, regional banks focusing on the local activities exhibit lower profit efficiency. Based on their finding they suggest that adequate levels of branch expansion have positive impacts on both cost and profit efficiencies for regional banks through diversifying banks' portfolio and reducing cost of deposit.

In addition Kazumine (2017) conclude that, regarding the cost performance of regional banks, establishing too many branches and maintaining branch networks that are too large can have negative effects on regional banks.

2.3.1.6. Banking sector Development

The total asset of the industry to GDP ratio indicates that financial development plays an important role in the economy. When the market becomes more competitive, banks need to adapt different strategies in order to retain profitability. As Samuel, 2015 cited Demirguc Kunt and Huizinga, 1998), present evidence that financial expansion and structure are important variables. Their results show that banks in countries where bank assets comprise a large portion of GDP generally have smaller margins and less profitability.

On the other hand Smirlock (1985), Bourke (1989) and Molyneux and Thornton (1992) found market growth as an external determinant of bank profitability. This is based on the assumption that an expanding market would produce greater potentials for banks to achieve higher profits.

2.3.1.7. Gross Domestic Product Growth

Gross domestic product has also been identified as another factor. Gross domestic product (GDP) is most commonly used macroeconomic indicator to measure total economic activity within an economy. The growth rate of GDP reflects the state of the economic cycle and is expected to have an impact on the demand for bank loans. The economic conditions and the specific market environment would affect the bank's mixture of assets and liabilities According to Ongore and Kusa (2013), trend of GDP affects the demand for banks asset in the sense that when trends are leaning towards a declining GDP growth, demand for credit falls which in turn negatively affect

the profitability of banks. Favorable economic conditions will affect the demand and supply of banking services positively. Therefore, during boom the demand for credit is relatively high compared to recession periods Sufian and Habibullah (2010).

Another view on the relationship between GDP and commercial bank's profitability is that by Vongand Hoi (2009) who asserts that there is a general perception that loan defaults are normally lower in times of favorable economic growth, while higher during unfavorable economic growth and these developments do affect the profits of the commercial banks in either direction depending on the circumstances.

Bank's profitability is limited by the growth rate of the economy. If the economy is growing at a good rate, a soundly managed bank would profit from loan. Economic growth can enhance bank's profitability by increasing the demand for financial transactions, i.e., the household and business demand for loans. Strong economic conditions also characterized by the high demand for financial services, thereby increasing the bank's cash flows, profits and non interest earnings. Thus there is a positive relationship between the growth rates of Gross domestic product and the profitability of the bank.

2.3.1.8. Inflation

Inflation has an effect on fiscal policy and monetary policy. In addition, the impact of inflation depends on whether it has been anticipated or not anticipated, that is, if it is anticipated the effects on ROA is positive, if not anticipated the effect would be negative on ROA Pan and Pan (2014).An inflation rate that is fully anticipated raises profits as banks can appropriately adjust interest rates in order to increase revenues. The negative effect of inflation could be the result of the inability of banks to correctly forecast and anticipate inflation in the economy.

High inflation rate is associated with higher costs as well as higher income. If a bank’s income rises more promptly than its costs, inflation is expected to exert a positive effect on profitability as inflation was anticipated which gave banks the opportunity to adjust the interest rates accordingly. On the other hand, a negative coefficient is expected when its cost increase faster than its income Eden (2014).

Several economists have found that countries with high inflation rates have inefficiently small banking sectors and equity markets. This effect suggests that inflation reduces bank lending to the private sector, which is consistent with the view that a sufficiently high rate of inflation induces banks to ration credit as stated by John and Bruce (2006). High doses of inflation may result in chain of events that ultimately leads to underdeveloped economic growth. The chain begins when high inflation lowers the real return on assets. Inflation is negatively associated with real money market rates, real Treasury bill rates, and real time-deposit rates; i.e., as inflation increases the real rate of return increases.

(Staikouraset.al, 2003) also point out that inflation may have direct effects and indirect effects on the profitability of the banks. From the literature review, the impact of inflation on profitability depends on whether the inflation is anticipated or unanticipated. If anticipated, the interest rates are adjusted accordingly resulting in revenues, which increase faster than costs, with a positive impact on profitability. If inflation is unanticipated, the banks may be slow in adjusting their interest rates, which results in a faster increase of bank costs than bank revenues that consequently have a negative impact on bank profitability.

The effect of inflation on bank profitability depends on the rate at which the bank's wages and other operating expenses increase compared to inflation. This usually depends on accuracy of the prediction of the future inflation which enable banks manage their operating costs. Perry (1992) supports this argument by stating that when inflation expectations are fully anticipated by the bank management, it provides room for interest rate adjustment in order to accelerate increase in revenues faster than the costs and subsequently, higher economic profits. On the contrary, Rasiah (2010) argues that the move by central banks in their quest to control inflation result in increased cost of borrowing as well as a fall in credit-creating capacity and subsequently the loans given to the commercial banks. This trickles down to a decline in the loans given by commercial bank. Furthermore, inflation has an adverse effect on commercial bank's profitability as it erodes the real value of bank's assets relative to their liabilities, hence it affects profits.

2.4. Empirical study on performance of Banks

2.4.1. Studies on other country

Paolo (2016) conducted a study by using data on commercial banks in seven Latin American countries from 1995 to 2012, the study identified several major relationships involving bank profitability, including: an inverse U-shaped relationship between banks' capital ratios and profitability, a positive relationship between asset diversification (e.g. security trading, hedge funds, foreign exchange, assurance ,etc.) and profitability, a negative relationship between revenue diversification (e.g. interests, fees, commissions, etc.) and profitability, a positive relationship between market concentration and profitability, and improvements in the legal and regulatory system are associated with a negative impact on banks' profitability. This paper contributes to the literature by assessing these relationships using data on Latin American banks and by estimating their models using a system GMM approach that addresses issues arising from endogenous independent variables and heterogeneity among individual banks

Cross country research by Andreas et. al, (2013) also analyses how bank-specific characteristics, macroeconomic variables, and industry-specific factors affect the profitability of 10,165 commercial banks across 118 countries over the period from 1998 to 2012. Grouping the countries according to three income levels, they showed that the determinants of bank profitability included on their model can explain existing profitability differences among commercial banks in low, middle, and high income countries. The profitability determinants vary quite widely across the different levels of income in terms of significance, sign and size of the effect. The level of income has thus an important impact on the determinants of bank profitability.

As Dereje (2015 cited Kunt and Huizinga 1999), using bank level data for 80 countries in the 1988-1995 periods, showed that differences in interest margins and banks' profitability reflect a variety of determinants. Such as the characteristics of the bank, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators.

When we come to single country studies Alper and Anbar (2011) investigated bank specific and macroeconomic determinants of commercial bank profitability in Turkey over the period of

2002-2010. The study uses both return on asset (ROA) and return on equity (ROE) as proxy for bank profitability. By employing balanced set of panel data and fixed effect model, the result shows that only real interest rate is positively related with profitability in regards to macroeconomic variables. In other words, an increase in real interest rate which is influenced by increase in inflation rates would lead to an increase in commercial banks' profitability in Turkey. Berger (2010) studied that countries with higher inflation observes that there is depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates resulting into a positive relationship between inflation and performance of banks.

By considering internal and external factors (Athanasoglou et al., 2005) conclude that the effect of bank-specific, industry-specific and macroeconomic determinants of bank profitability, using an empirical framework that incorporates the traditional Structure-Conduct-Performance (SCP) hypothesis. The results indicated that all bank-specific determinants, with the exception of size, affect bank profitability significantly in the anticipated way.

Despite the above result Dereje (2015) also cited Staikouras and Wood (2004) constructed the OLS and fixed effect models to examine the determinants of European bank profitability from 1994 – 1998. The authors found that the profitability of European banks is influenced not only by factors related to their management decisions but also to changes in the external macroeconomic environment.

Khrawish (2011) accessed the Jordanian commercial bank profitability from 2000 through 2010, and categorized the factors affecting profitability into internal and external factors. The author found that there is significant and positive relationship between return on asset (ROA) and exchange rate of the commercial banks and that there is significant and negative relationship between ROA of the commercial banks and annual growth rate for gross domestic product and inflation rate.

Mohammad Sajid Saeed (2014) investigates the impact of bank-specific, industry-specific, and macroeconomic variables on bank profitability before, during, and after the financial crisis of 2008 of United Kingdom. For this purpose, 73 UK commercial banks are selected on the basis of availability of required information. The empirical data for these banks are collected for the

period from 2006 to 2012 from Bank scope and Data-stream databases. The regression and correlation analyses are performed on the data and concluded that bank size, capital ratio, loan, deposits, liquidity, and interest rate have positive impact on ROA and ROE while GDP and inflation rate have negative impact

The study in Switzerland, Detrich and Wanzennied (2009) investigated the determinants of the profitability of commercial banks using data of 453 banks from 1997 to 2006. In employing panel data approach, the results from the study show that macroeconomic factors, GDP growth variable has a positive effect on bank profitability, while the effect of tax rate and market concentration rate has a significant negative effect on bank profitability.

On the other side there are findings that favor internal determinants than external as a major factor of profitability. Olweny and Shipho (2011) evaluated the effects of banking sector factors on the profitability of commercial banks in Kenya, using panel data from 2002 to 2008 of 38 commercial banks. The authors concluded that the bank-specific factors are more significant factors influencing the profitability of commercial banks in Kenya than market factors. The study revealed that profitable commercial banks are those that strive to improve their capital bases, reduce operational costs, improve assets quality by reducing the rate of non-performing loans, employ revenue diversification strategies as opposed to focused strategies and keep the right amount of liquid assets Dereje (2015).

2.4.2. Empirical studies in Ethiopia

Most literatures that are examined in this study used banks specific, industry specific and macroeconomic factors as a determinant of banks profitability. Empirical evidence which included in this study are determinants of commercial banks profitability: an empirical study on Ethiopian commercial banks by, Demena (2011), determinants of commercial banks profitability: an empirical review of Ethiopian commercial banks by Belayneh (2011), factors affecting profitability: an empirical study on Ethiopian banking industry by Amdemikael (2012), determinants of commercial banks profitability: an empirical evidence from the commercial banks of Ethiopia by Birhanu (2012), determinants of bank profitability: an empirical study on Ethiopian private commercial banks by Habtamu (2012), Determinants of commercial Banks

Profitability: The case of Ethiopian Commercial Banks by Samuel (2015), Determinants of Bank Profitability in Ethiopia: A Case Study of Private Commercial Banks by Melaku (2016), The Determinants of Private Commercial Banks Profitability: In the Case of Selected Ethiopian Private Banks by Moges (2017) and The Determinants of Private Commercial Banks Profitability: an Empirical study on Ethiopian Private Commercial Banks by Dawit (2017). This particular section provides a detailed review of the above mentioned papers chronologically

Belayneh (2011) examined the 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 some internal as well as external variables on major profitability indicator i.e., ROA, The estimation results of his study show that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks profitability in Ethiopia. Market concentration is also a significant determining factor of profitability. Finally, with regard to macroeconomic variables, only economic growth exhibits a significant relationship with banks' profitability.

The study made by Amdemikael (2012) examined the determinants of Ethiopian commercial banks profitability. The study applied the balanced panel data of eight Ethiopian commercial banks that covers the period 2001- 2011. The study adopts a mixed methods research approach by combining documentary analysis and in-depth interviews to investigate the impact of some internal as well as external variables on major profitability indicator i.e., ROA. The findings of the study show that capital strength, income diversification, bank size and gross domestic product have statistically significant and positive relationship with bank's profitability. On the other hand, variables like operational efficiency and asset quality have a negative and statistically significant relationship with bank's profitability. However, the relationship for liquidity risk, concentration and inflation is found to be statistically insignificant.

Habtamu (2012) examined the determinants of Ethiopian private commercial banks profitability. The study applied the balanced panel data of seven Ethiopian commercial banks that covers the period 2002- 2011. The paper used Ordinary Least Square (OLS) technique to investigate the impact of some internal as well as external variables on profitability indicator i.e., ROA, ROE &

NIM, the finding shows The empirical results shows that bank specific factors; capital adequacy, managerial efficiency, bank size and macro-economic factors; level of GDP, and regulation have a strong influence on the profitability of private commercial banks in Ethiopia.

The paper by Tesfaye (2014) investigates the determinants of Ethiopian banks performance considering bank specific and external variables on selected banks' profitability for the 1990-2012 periods. The empirical investigation uses the accounting measure Return on Assets (ROA) to represent Banks' performance. He finds that bank specific variables by large explain the variation in profitability. High performance is related to the ability of banks to control their credit risk, diversify their income sources by incorporating non-traditional banking services and control their overhead expenses. In addition, he found that bank's capital and liquidity status are not significant to affect the performance of banks. On the other hand, he found that bank size and macro-economic variables such real GDP growth rates have no significant impact on banks' profitability except the inflation rate is determined to be significant driver to the performance of the Ethiopian commercial banks. He used multiple linear regression model with endogenous and exogenous variables separately first and then combined

The research done by Dereje (2015) main objective was to examine the effect of external determinants on Ethiopian commercial banks from the period 1985 -2013. He classified the external determinants in to two namely in to industry-specific and macroeconomic determinants. The study used OLS estimation method to measure the effects of external determinants on profitability. Profitability was measured by three indicators: Average Return on Asset, Average Return on Equity and Net Interest Margin in order to analyze the behavior of each across years. The results show that real GDP growth was found to have a positive effect on profitability of commercial banks of Ethiopia as measured by ROA and Concentration ratio was found to have a negative effect on profitability of commercial banks of Ethiopia as measured by ROA while the Inflation rate, Real interest rate and Exchange rate were not significant in determining the profitability of commercial banks of Ethiopia as per the linear regression model.

On the other hand Samuel (2015) identified the determinants of Ethiopian commercial Banks Profitability. His objective is to investigate determinants of commercial banks profitability in Ethiopia by using panel data of eight commercial banks from year 2002 to 2013. The study used

mixed research approach and secondary financial data are analyzed by using multiple linear regressions models for the bank profitability measure, Return on Asset (ROA). The findings of the study show that bank size, capital adequacy and gross domestic product have statistically significant and positive relationship with bank's profitability. On the other hand, variables like liquidity risk, operational efficiency, funding cost and banking sector development have a negative and statistically significant relationship with banks' profitability. However, the relationship for Management efficiency, employee efficiency, Inflation and foreign exchange rate is found to be statistically insignificant.

Tesfaye (2016) Investigated that the determinants of Ethiopian banks performance by considering bank specific and external variables on selected banks' profitability for the 1990-2012 periods. The empirical investigation uses the accounting measure Return on Assets (ROA) to represent Banks' performance. High performance is related to the ability of banks to control their credit risk, diversify their income sources by incorporating non-traditional banking services and control their overhead expenses. In addition, the paper finds that bank's capital and liquidity status are not significant to affect the performance of banks. On the other hand, the paper finds that bank size and macro-economic variables such real GDP growth rates have no significant impact on banks' profitability. However, the inflation rate is determined to be significant driver to the performance of the Ethiopian commercial banks.

Melaku (2016) investigated that the determinants of bank profitability in Ethiopian private banks by using audited financial statements of six sampled private commercial banks for the period of 2004 to 2011 and National bank of Ethiopia. Novel features of the study were the analysis of variables which are missed by other researcher; labor productivity, overhead, liquidity, and market share. The study used return on assets (ROA) as dependent profitability variable. Moreover, the study used both bank specific and external variables as explanatory variables. Both descriptive statistics and econometrics model specifically fixed effects estimation were used to analyze the relationships of dependent variable with explanatory variables. The major findings of the study shows that bank specific determinants were very important in explaining profitability than external variables. The Asset size, capitalization, labor productivity, liquidity and non-interest income were positively and significantly related to bank's profitability, while

credit risk and overhead efficiency have a negative impact on profitability of bank specific drivers.

According to Dawit (2017) the determinants of bank profitability in Ethiopian private banks by using audited financial statements of six sampled private commercial banks for the period of 2005 to 2015. Both internal and external determinants of Bank profitability affect the profitability of Private Commercial Banks in Ethiopia. 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. The empirical results showed that capital, operational efficiency, income diversification, concentration and money supply have significant relationship with profitability of Ethiopian private commercial banks. However the result shows insignificant relationship between profitability of Ethiopian private commercial banks with liquidity, GDP and inflation.

As Moges (2017) econometric result shows that, the variable bank size and GDP growth rate has a positive and significant impact on private commercial banks ROA and ROE. While, interest rate spread has a negative and significant impact. The variable Loan to deposit ratio has negative and significant impact on banks ROA while, it has no effect on their ROE. Inflation also an important variable in explaining ROA at 10% significant level but, it has no effect on ROE. The other important variable in explaining ROE is loan concentration index it has positive and significant impact on banks ROE. But, it does not significantly explain ROA.

2.5. Conceptual Framework

Different empirical evidences suggest that profitability of financial institutions specifically banks is affected by internal (Bank Specific), Industry Specific and Macro Economic determinants. This study also used both internal and external factors. The internal determinant includes Number of Branches (Branch expansion), Financial Leverage, Liquidity, Managerial efficiency, and Bank size. On the other hand, Industry specific determinants of bank profitability Banking sector Development and macroeconomic determinants include level of GDP and Inflation. The dependent variable is ROA.

From the literature review, discussed above, the researcher constructed the following conceptual framework to summarize the main focus and scope of this study in terms of dependent and independent variables

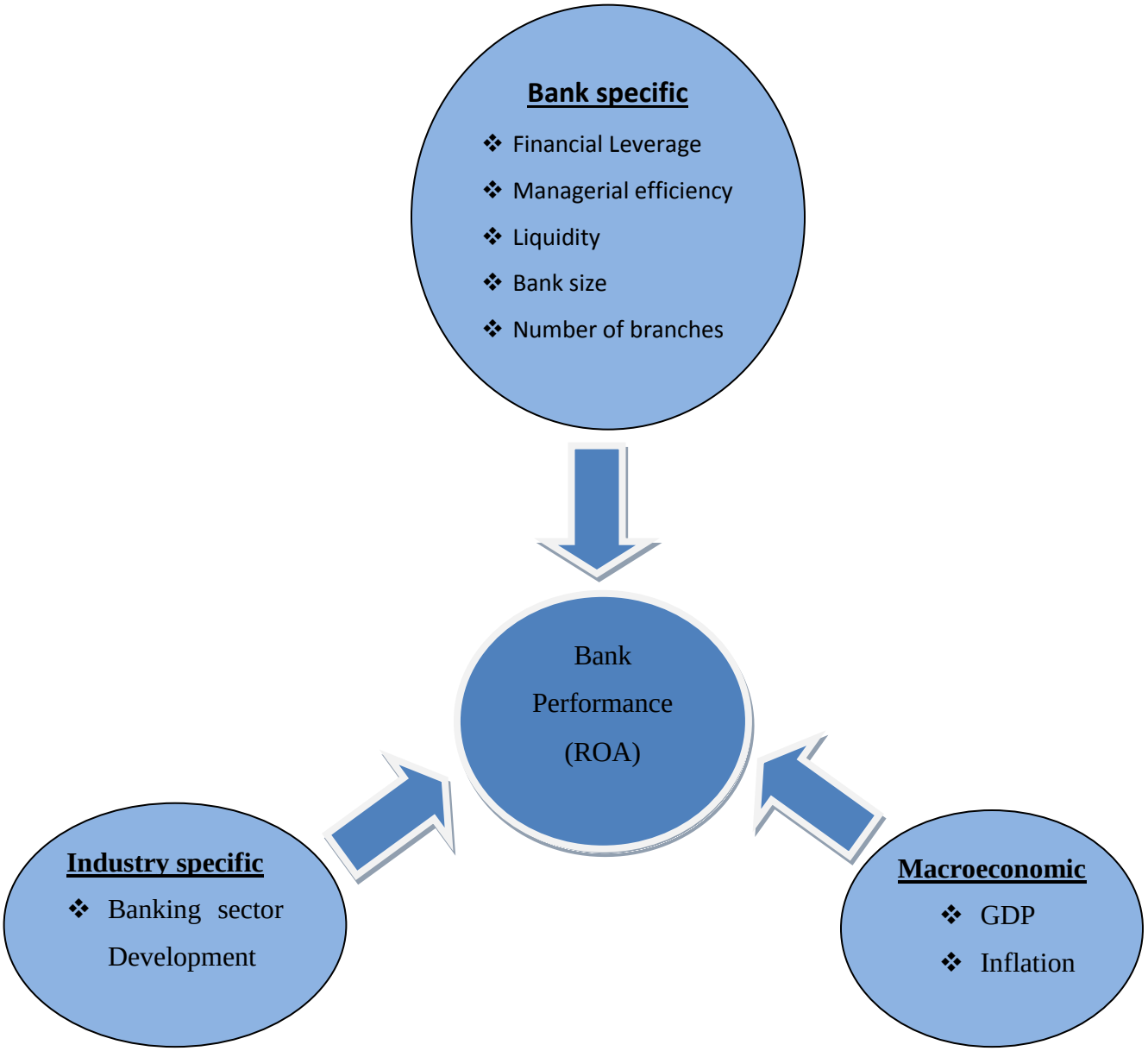


Figure 2.1: Conceptual Framework for the Study

2.6.Summary and Knowledge gap

In line with the above theoretical as well as empirical review, financial performance is important to all business specially for banking industry since the stability of commercial banks depends on their performance and the whole economy stability of the nation highly related to the stability of commercial banks. The empirical literatures that are discussed so far showed that, banks performance is determined by both internal (Bank Specific) and external (Industry specific and macroeconomic) factors. However, Most of the literatures that are discussed so far appeared to have focused on studies that were conducted in the banking sector of different countries outside Ethiopia. This is because not many studies have been assessed on internal and external determinants of Ethiopian Private commercial banks performance.

In the context of Ethiopia, the studies conducted by Demena (2011), Melaku (2016), Kebede (2014), Samuel (2015), Dereje (2015), Dawit (2017) assessed the determinants of profitability in Ethiopian commercial banks by using both internal and external factors. Accordingly, as per the knowledge of the researcher, all the studies conducted in Ethiopian banking sector clearly failed to identify all the determinants of performance and also this research added one variable Financial Leverage to the study of determinants of profitability of banks in Ethiopia that has not been tested in the previous researches moreover, the result from different researchers as indicated in the literature review reveals the existence of controversial conclusions that results from different studies made so far. Hence, the purpose of this study is to investigate the determinants of performance in Ethiopian private commercial banking sector by utilizing an econometrics model so as to estimate both the internal and external determinants of performance of private commercial banks in Ethiopia which is proposed to fill the existing knowledge gap.

CHPTER THREE

3. Research Methodology

3.1. Approach and design

When conducting a research, there are different ways of approaching the problem. According to Creswell (2009), there are three approaches of research; quantitative, qualitative and mixed.

Quantitative research is a means for testing objective theories by examining the relationship among variables. On the other hand, qualitative research approach is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem with intent of developing a theory or pattern inductively Creswell(2009). Finally, mixed methods approach is an approach in which the researchers emphasize the research problem and use all approaches available to understand the problem Creswell (2003).As the objective is examining the relationship between variables, this study employed quantitative approach.

3.2. Research design

The main objective of this study is to examine the relationship between bank specific, industry specific and macro Economic variables with private commercial banks performance in Ethiopia for the period covers 2001 to 2017.

This research employed an explanatory research method that adopts a quantitative research design by using a secondary data. Because the explanatory research method is useful especially when a study needs to measure the cause and effect relationships between dependent and independent variables**.**

3.3. Population and sampling design

3.3.1. Study population

All operational private commercial banks in Ethiopia were taken as the study population. Currently there are 16 operational private commercial banks in Ethiopia.

3.3.2. Sampling design

The study prefers to use Purposive sampling technique for selecting the sample units from population. The rationale behind to select purposive sampling techniques than others is, it considered more appropriate when the universe happens to be small and a known characteristic of it is to be studied intensively. The ground behind to select samples among Private Banks is time of establishment. Therefore the population of this study was all Private Commercial Banks in Ethiopia which started their operation before 2001. As results, among 16 private commercial banks, six private commercial banks such as Awash Bank, Abyssinia Bank, Dashen Bank, Wegagen Bank, United Bank, and Nib International Bank were included in the study.

3.4. Data Type and Sources

The types of data that used in this study were balanced panel data and Quantitative in nature. Balanced panel data meaning that, each cross sectional units will be same number of time series observation. The investigator will collect Secondary data from annual reports of each sampled banks and NBE to conduct this study. Therefore, the main Secondary data of the study will be financial statements of the respective banks and Macroeconomic data will be gathered from National bank of Ethiopia (NBE). The collected data were analyzed by using E-views 8 windows software package.

3.5. Financial Performance Measures

Financial performance of commercial banks is measured through the following variables:-

- **ROE**:- is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is what the shareholders look in return for their investment. A business that has a high return on equity is more likely to be one that of generating cash internally. Thus, the higher the ROE the better the company is in terms of profit generation. It is further explained by Khrawish (2011) that ROE is the ratio of Net Income after taxes divided by Total Equity Capital. It represents the rate of return earned on the funds invested in bank by its stockholders. ROE reflects how effectively a bank management is using shareholders' funds. Thus, it can be deduced from the above statement that the better the

ROE the more effective the management in utilizing the shareholder's capital. It measures the efficiency in generating profit from every unit of equity ownership.

- **ROA**: is also another major ratio that indicates the performance of a bank. It is a ratio of Income to its total asset. It measures the ability of the bank management to generate income by utilizing company assets at their disposal.
- **NIM**: is a measure of the difference between interest income and interest expense relative to the value of the assets. It is as a rule articulated as a percentage of what the bank earns on loans and other assets in a time period minus the interest expensed on borrowed funds divided by the average value of the assets on which it earned income in that time period (Gul et. al, 2011).

3.5.1. Dependent variable

All the strategies designed and activities performed thereof are meant to realize this grand objective. However, this does not mean that commercial banks have no other goals. Commercial banks could also have additional social and economic goals. However, the intention of this study is related to the first objective, performance.

As Samueal (2015 cited Alexandru et. al., 2008) to measure the profitability of commercial banks there are variety of ratios used. Earlier research works indicated that Return on assets (ROA) is an important measurement used in comparing the operating performance of banks; some of them are (Rivard& Thomas 1997; Kosmidou2008; Belayneh 2011; Chan &Vong2010; Anwar et al., 2011 and Chen Mei et al.2013).

3.5.1.1. ROA

As Tobias and Themba (2011) points out, the ROA has emerged as key ratio for the evaluation of bank performance and has become the most common measure of bank profitability. More over as Dereje (2015), the following authors also used ROA as a measure of bank performance (Yuqi Li 2006; Abebaw and Depaack 2011; Berger 1995; Indranarain Ramlall 2009; Tobias and Themba 2011;Belayneh 2011 and Athanasoglou et al. 2008).

Rivard and Thomas (1997) suggested that bank performance is best measured by ROA in that ROA is not distorted by high equity multipliers and ROA represents a better measure of the ability of a firm to generate returns on its portfolio of assets. Moreover, ROA is a substantial performance measure for the reason that it is directly related to the profitability of banks (Kosmidou 2008; Melaku 2016). Accordingly, bank performance in this study was measured by ROA since it showed a better measurement as compared to ROE and NIM and consistent with above writers.

It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities.

ROA is the major ratio that indicates the profitability of a bank. It is a ratio of net income to its total asset Khrawish (2011). It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution Khrawish (2011). As Samuel (2015) cited Wen (2010) higher ROA shows that the company is more efficient in using its resources. Hence this study will use a dependent variable ROA to measure profitability.

ROA= Net Income/Total Asset

3.5.2. **Independent Variables**

3.5.2.1. Bank-specific variables

The Bank-specific variables are selected by using some key drivers of profitability like earnings, efficiency, risk taking and leverage. Profitability is driven by the ability of a bank in generating sufficient earnings or in lowering operational cost, implying being more efficient. Furthermore, due to the special nature of banks, risk taking and leverage are also very important drivers for profitability. According to Samuel (2015) theoretical academic literature suggests that there is a risk-return tradeoff, higher risks is associated with higher profits. Risk taking could relate to the quality of assets, liquidity of assets and to the capital structure of a bank. Hence, the following

part of this particular section clearly presents the bank-specific variables that are used in this particular study.

3.5.2.1.1. Managerial efficiency

The ratios of operating expenses to operating income and operating expenses to total assets are commonly used to measure Managerial efficiency of the banks. Indranarain (2009), and Molyneux and Thornton (1992) stated that Higher the efficiency level of a bank, higher its profits level. Hence a positive relationship is expected between efficiency and profitability of banks. The analysis of the quality of a management is based on the experience of the management and their track record in terms of their vision and competence in running the bank.

MGE= Operational expense/ operational income

3.5.2.1.2. **Bank Size**

According to Belayneh (2011) one of the most important questions regarding bank profitability is whether or not bank size optimizes profitability. Generally, the effect of size on profitability is expected to be positive to a certain extent. However, for banks that become extremely large, the effect of size could be negative due to bureaucracy and other reasons. Hence, the size-profitability relationship may be expected to be nonlinear and the study also used the banks' logarithm of total assets in order to capture the possible non-linear relationship and to remove the scale effect.

BS= Natural LOG of total Asset

3.5.2.1.2. Liquidity

Another important decision that the managers of commercial banks must take refers to the liquidity management and specifically the ability of an organization to meet its obligations and the solvency of organization. It indicates the percentage of bank's loans funded through deposits.

The ratio of bank's advances to deposits is used as a measure of liquidity. As (Al-Qudahet.al. 2013) discovered that negative correlation exists between the level of liquidity and profitability. However, Samad (2015) found a significant positive relationship between liquidity and bank profitability. Thus the relationship between liquidity and profitability is indeterminate.

LIQ= Bank advance/Deposit

3.5.2.1.3. Financial leverage

Leverage measured by total Liability to total assets (TL/TA). Leverage means magnification of either profits or losses. Leverage represents metrics tool to determine the possibility of the inability of the firm to pay its debts, particularly in the long term. Therefore, the increase in financial leverage increases the possibility of the firm's exposure to non-financial solvency and bankruptcy. In spite of the importance of using debt in the financing structure because the debt interest achieved a tax shed advantage for the company, but they may cause a conflict of interests of creditors and owners, since creditors are looking for low-risk investments while investors are looking for profitable investments. Financial leverage happened when an organization uses short or long term debt to magnify profits (Booth & Seen Clearly (2008) cited in Ali Mustafa Al-Qudah1 et.al., 2013).the authors choose in this research paper to use the total debt to total asset ratio as a measurement of financial leverage

FL= Total Debt/Total Asset

3.5.2.1.4. Number of Branches

BR= Total Number of Bank Branches

3.5.2.2. Industry-specific variables

This subsection discusses the industry concentration and banking sector development variables separately from bank-specific variables as far as this variable is to some extent external. That means managers cannot change the variable immediately like that of bank-specific variables.

3.5.2.2.1. **Banking sector development**:

The total asset of the industry to GDP ratio indicates that financial development plays an important role in the economy. When the market becomes more competitive, banks need to adapt different strategies in order to retain profitability. As Samuel (2015) cited Demirguc Kunt and Huizinga (1998), present evidence that financial expansion and structure are important variables. Their results show that banks in countries where bank assets comprise a large portion of GDP generally have smaller margins and less profitability.

BSD= Total Asset/GDP

3.5.3. Macro-Economic Variables

There is wide variety of literatures that support the impact of the macroeconomic factors on bank performance. According to Dereje (2015), the macroeconomic policy stability, Gross Domestic Product Growth Rate, Inflation, Interest Rate and Political instability are macroeconomic variables that affect the performances of banks.

3.5.3.1. Gross Domestic Product (GDP)

Most literatures support the positive impact of economic growth to Bank performance. For instance the trend of GDP affects the demand for banks asset. During boom the demand for credit is high compared to recession (Athanasoglou et al., 2005; Belayneh2011; Andreas and Gabrielle 2009; and Athanasoglou et. al., 2008). Hence the expected relationship between bank profitability and GDP will be positive.

3.5.3.2. Inflation

(Perry, 1992 as cited in Dereje (2015) the effect of inflation is also another important determinant of banking performance. In general, high inflation rates are associated with high loan interest rates and thus high income. However, asserts that the effect of inflation on banking performance depends on whether inflation is anticipated or unanticipated. (Athanasoglou et. al, 2005), state in relation to the Greek situation that the relationship between inflation level and banks profitability is remained to be debatable. The direction of the relationship is not clear Vong and Chan (2009).

Moreover according to Belayneh (2011) high inflation rate is associated with higher costs as well as higher income. If a bank's income rises more rapidly than its costs, inflation is expected to exert a positive effect on profitability. On the other hand, a negative coefficient is expected when its costs increase faster than its income.

3.6. Data analysis

To achieve the broad research objective, the paper was primarily based on panel data, which was collected through structured document review. This is because panel data has the advantage of giving more informative data as it consists of both the cross sectional information, which captures individual variability, and the time series information, which captures dynamic adjustment, the collected panel data were analyzed using descriptive statistics and multiple linear regression analysis. The descriptive statistics (Mean, maximum and minimum values and standard deviations) was used to analyze the general trends of the data from 2001 to 2017. A multiple line regression model and t-static was used to determine the relative importance of each independent variable in influencing profitability. For this study, the regression analysis known as OLS was used to estimate the relationship between profitability and its determinants using E-views 8 econometric software package.

3.7. Model Specification

In this research based on the past literature reviewed, a panel data regression is employed to examine the effect of internal and external variables on banks profitability. Those independent variables are: Liquidity (LIQ), Financial Leverage (FL), Number of Branches (BR), Bank size

(BS), Managerial efficiency (MGE), Banking Sector Development (BSD), gross domestic product (GDP) and inflation (INFL) with dependent variable return on asset (ROA).

The regression model is stating, ROA as a function of the selected bank specific, industry specific and macroeconomic variables are as shown below

ROA = β0 + β1FL + β2BR +β3LIQ + β4BS + β5MGE+β6 BSD + β7 GDP + β8INFL+ε

Source: Developed for the research

As Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators (BLUE). Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not in the model. Thus, the following section discusses about the nature and significance of the model specification tests.

Test for Heteroscedasticity

According to Brooks (2008), Heteroscedasticity means that error terms do not have a constant variance. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. To test for the presence of heteroscedasticity, the popular white test is employed in this study. The hypothesis for the Heteroscedasticity test was formulated as follow:

H_0: There is no Heteroscedasticity problem in the model.

H_1: There is Heteroscedasticity problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value is less than significance level. Otherwise, do not reject H_0.

Test for Autocorrelation

According to Brooks (2008), when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. In this study to test for the existence of autocorrelation, the popular Breusch-Godfrey Serial Correlation LM Test was employed.

The hypothesis for the autocorrelation test was formulated as follow:

H_0: There is no autocorrelation problem in the model.

H_1: There is autocorrelation problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value less than significance level. Otherwise, do not reject H_0.

Test for normality

As noted in Brooks (2008) a normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. One of the most commonly applied tests for normality; the Bera-Jarque formalizes these ideas by testing whether the coefficient of skewness and the coefficient of excess kurtosis are zero and three respectively. Brooks (2008) 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 hypothesis for the normality test was formulated as follow:

H_0: Error term is normally distributed

H_1: Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value of JB less than significance level. Otherwise, do not reject H_0.

Test for Multicollinearity

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable 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. Usually, as noted by (Hair et. al,. 2006) correlation coefficient below 0.9 may not cause serious multicollinearity problem.

3.8. Conclusion

Chapter three included the methodology used to perform data analysis in Chapter four. This study employed quantitative and secondary data and Ordinary least square method to test the relationship between Internal and external factors and profitability of commercial banks in Ethiopia. Besides that, a diagnostic test was conducted to confirm the reliability of the results. Chapter four will show out all the details regarding the hypothesis testing and diagnostic tests carried out for the collected data.

Table 3.1: List of Variables and their Respective Characteristics

Variables			measurement	Notation	Expected sign
Dependent Variable	ROA		The return on Average Total Asset of the bank in year t	ROA	NA
Independent variable	Bank Specific Determinants	Bank size	Natural log of total Asset	BS	+/-
		Number of Branches	Bank Branches	BR	+/-
		Management Efficiency	The ratio of operating expense to operating income	MGE	+
		liquidity	Bank Advance/Deposit	LIQ	+/-
		Financial leverage	Total Liability to Total Asset	FL	-/+
	Industry specific variables	Banking sector development	Total Asset of the industry / GDP	BSD	-
	Macroeconomic Variables	Gross Domestic Product	Real GDP growing (in %)	GDP	+
		Inflation	Annual Inflation Rate	INFL	+/-

CHAPTER FOUR
4. RESULTS AND DISCUSSION

In the preceding chapter the research design employed in this study is presented and discussed in detail. The purpose of this chapter is to present results and analysis of data involved in this 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 for the regression model are presented and discussed in detail.

The regression method used for this study was the Ordinary least square method which is one of the panel data analysis methods. This was used to determine the line of best fit for the model through minimizing the sum of squares of the distances from the points to the line of best fit. Through this method, the analysis assumed linearity between the dependent variable and the independent variables.

4.1. Descriptive statistics

In this section the results from descriptive statistics are discussed. Generally, the data that were collected for this study are secondary in nature. The descriptive statistics was used in order to get insight into the variables of the determinants of banks profitability among the sampled banks and it is used as a base to forward recommendations after determining the relationship between the variables from the regression analyses.

The basic descriptive statistics of the variables (both dependent and independent variables) are presented in Table 4.1. For each variable, the table shows mean, median, standard deviation, minimum and maximum values. In all, a total of 102 observations were presented for six private commercial banks covering a period of 2001-2017.

Table 4.1: Descriptive statistics summary

Number of observation (N) = 102

	ROA	MGE	LIQ	INFL	GDP	FL	BSD	BS	BRN
Mean	2.5650	0.3860	0.4421	11.9235	0.0916	0.7718	0.3476	9.6707	71.8431
Median	2.7410	0.3947	0.4244	9.7000	0.1040	0.7900	0.2592	9.7649	47.0000
Maximum	4.2000	0.6136	0.7820	36.4000	0.1260	0.8800	0.7711	10.6230	316.0000
Minimum	0.4500	0.1789	0.2218	-10.6000	-0.0210	0.6000	0.1405	8.3304	6.0000
Std. Dev.	0.7861	0.0825	0.1388	11.3885	0.0376	0.0591	0.1985	0.5257	67.4228

Source: Researcher own computation

As shown in the table 3 above, the mean value of return on assets (ROA) was around 2.6% for sampled private commercial banks in Ethiopia. This means that a one birr investment in total assets of private banks' generates birr 2.6 average profits for the period of 2001-2017. The standard deviation among banks in terms of profitability was 0.78%; this confirms that there was small variation among banks' during the study period.

The bank size was proxy to their natural logarithm of each bank's total asset. The average value of this variable was 9.67 birr during the study period with standard deviations of 0.57 birr. The minimum and maximum values were 8.33 and 10.62 birr respectively. This shows that there was moderate discrepancy between banks in terms of total assets when their natural logarithms values have taken.

The ratio of Liquidity (LIQ) is measured by bank current asset to total asset. The mean value of liquidity ratio was 44.21%; it shows that the sector was very liquid, two times more than the minimum statutory liquidity ratio of 20% set by NBE. The standard deviation was 13.88%, while 22.18% and 78.20% observed as minimum and maximum values respectively. As shown from the result, there were higher discrepancies among banks regarding liquid management.

When we come to macroeconomic variables, the first variable is GDP. The mean of growth domestic product is 9.1%, minimum value is -.2.1% with a maximum value of 12.6 % and a standard deviation of (3.76). This implies that economic growth in Ethiopia during the period of 2001 to 2017 remains reasonable stable and the result of this stable economic growth contribute positively to the commercial banks profitability. The other macro-economic variable employed in this study is inflation, which had a mean value of 11.92% with standard deviation of 13.38% during the study period. The minimum and maximum values were -10.60 % and 36.40% respectively. Inflation had somewhat a higher standard deviation (13.38) compared to GDP; this implies that inflation rate in Ethiopia during the study period remains somewhat unstable. This clearly shows that there was a bit more variations in terms of cost of living as it measured by consumer price index (CPI).

Test results for the classical linear regression model assumptions

As mentioned in the methodology part of this study, as far as the assumptions of classical linear regression model hold true, the coefficient estimators of both α (constant term) and β (independent variables) that are determined by ordinary least square (OLS) will have a number of desirable properties, and usually known as Best Linear Unbiased Estimators (BLUE). Hence, the following sections discuss results of the diagnostic tests (i.e., heteroscedasticity, autocorrelation, multicollinearity, normality and model specification test) that ensure whether the data fits the basic assumptions of classical linear regression model or not.

Heteroskedasticity test

According to Brooks (2008), when the scatter of the errors is different, varying depending on the value of one or more of the independent variables, the error terms areheteroskedastic. Heteroscedasticity test is very important because if the model consists of heteroskedasticity problem, the OLS estimators are no longer BEST and error variances are incorrect, therefore the hypothesis testing, standard error and confident level will be invalid.

A WHITE' test has been made, to ensure that this assumption is no longer violated. The hypothesis for the heteroskedasticity test was formulated as follow;

H0: There is no heteroskedasticity problem

H1: There is heteroskedasticity problem.

α = 0.05
Decision Rule: Reject H_0 if P value is less than significant level 0.05. Otherwise, do not reject H_0.

Table 4.2. Heteroskedasticity Test result: white

	P-value	Decision rule
F-statistic	0.8705	Do not reject H0
Obs* R-squared	0.7838	Do not reject H0
Scaled explained SS	0.3437	Do not reject H0

Source: researcher Own computation

Autocorrelation

According to Brooks (2008), when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. It is assumed that the distribution errors are uncorrelated with one another and that the errors are linearly independent of one another. Autocorrelation error occurs when there is a serial correlation between residuals and their own past values. In this study, Breusch-Godfrey Serial Correlation LM Test is used to carry out the autocorrelation test. The p-value is obtained to examine whether the autocorrelation problem occurs in the model.

If the p-value is more than 5% significant level, it implies that there is no autocorrelation problem in the model. The hypothesis for the model specification test was formulated as follow;

H0: There is no autocorrelation problem.

H1: There is autocorrelation problem.

α = 0.05

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0.

Table 4.3. Autocorrelation test result: Breusch-Godfrey serial correlation LM test

	P value	Decision rule
Breusch-Godfrey serial correlation LM test	0.1173	Do not reject H0

Source: researcher Own computation

The above autocorrelation test result shows that do not reject the null hypotheses because the p value is 0.1173 which is above the significant level 0.05, thus we can concluded that there is no problem of autocorrelation in this model.

Normality Test

Another third important diagnostic test conducted in this paper is the normality assumption. Normality test is used to determine whether the error term is normally distributed. Brooks (2008) noted that the Jarque-Bera statistic would not be significant for disturbance to be normally distributed around the mean. The purpose of the Jarque-Bera test is to make sure that the data set is well modeled by a normal distribution. The hypothesis for the normality test was formulated as follow:

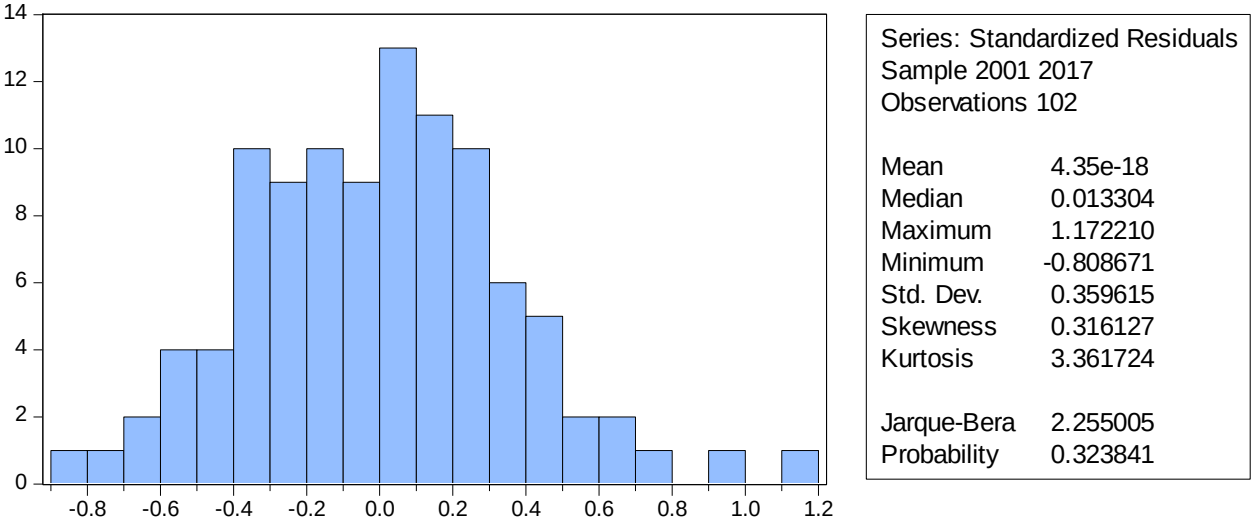
H0: Error term is normally distributed

H1: Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject H0 if P value of JB less than significant level 0.05. Otherwise, do not reject H0.

Figure 4.1: Histogram normality test



Source: Researcher own computation

As shown in figure 2 since, the histogram is bell-shaped and distribution of the panel observation is symmetric about its mean. The Jarque-Bera statistic has a P-value of 0.3238 implies that the p-value for the Jarque-Bera test is greater than 0.05 which indicates that there was no evidence for the

presence of abnormality in the data. Thus, the null hypothesis that the data is normally distributed should not be rejected since the p-value was considerably in excess of 0.05.

Multicollinearity test

According to Brooks (2008), multicollinearity will occur if some or all of the independent variables are highly correlated with one another. 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. This study uses high pair-wise correlation coefficients method to detect the existence of multicollinearity. High pair-wise correlation coefficients method sees the correlation of independent variables between each other one by one. According to Hair et.al (2006) correlation coefficient below 0.9 may not cause serious multicollinearity problem.

Table 4.4: Multicollinearity test result

	ROA	MGE	LIQ	INFL	GDP	FL	BSD	BS	BRN
ROA	1								
MGE	0.53585	1							
LIQ	-0.02935	0.14769	1						
INFL	0.48457	0.24339	0.17798	1					
GDP	0.63372	0.24503	-0.06330	0.28159	1				
FL	-0.02933	-0.04532	-0.12558	0.02247	0.17257	1			
BSD	0.37185	0.20310	-0.52748	0.10605	0.20525	0.16319	1		
BS	0.59695	0.35831	-0.32636	0.34790	0.42005	0.36026	0.84554	1	
BRN	0.25136	0.16910	-0.50037	-0.00020	0.19066	0.27054	0.84111	0.80499	1

Source: Researcher own computation

The above table showed that there is no strong pair-wise correlation between the explanatory variables (BR, BS, LIQ, FL, MGE, BSD, INF and GDP). As a rule of thumb, inter-correlation among the independent variables above 0.90 signals a possible multicollinearity problem. In this study the highest correlation coefficient is 0.84554 between Banking Sector Development and Bank size. Thus, it can be concluded that almost all variables have not high correlation power

which implies no multicollinearity problem in the explanatory variables selected to determine profitability of commercial banks.

Ramsey-RESET Test

Model specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form. When the omitted variable is correlated with the variable which included, the estimators will be biased and inconsistent and model specification error will tends to occur. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent and model specification error will not occur.

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 was formulated as follow;

H0: The model specification is correct.

H1: The model specification is incorrect.

$\alpha = 0.05$

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0.

Table 4.5: Model specification Test result: Ramsey-RESET test

	Probability F -statistics	Decision rule
Ramsey-reset test	0.6424	Do not reject H0

Source: researcher Own computation

Random Effect versus Fixed Effect Models Test

To test the relationship between these commercial banks profitability (ROA) and identified profitability determinants, the theoretical model is developed based on the finance theory from the methodological part of this study. The important issue from the equation (1) panel model is, it is not specified whether it is fixed effects or random effects model. So the focal point the researcher concern here is, to examine whether individual effects are fixed or random. Because, there are broadly two classes of panel data estimator approaches that can be employed in

empirical research: fixed effects models and random effects models. This also requires the high concern when the researcher employed the panel data approaches.

According to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model (FEM) and random effect model (REM). Hence the choice here is based on computational convenience. On this score, FEM may be preferable. Since the number of time series (i.e. 17 year) is greater than the number of cross-sectional units (i.e. six Private commercial banks), FEM is preferable in this case.

4.2. Discussion of Regression results

Under the following regression outputs the beta coefficient may be negative or positive; beta indicates that each variable's level of influence on the dependent variable. P-value indicates at what percentage or precession level of each variable is significant. R^2 values indicate the explanatory power of the model and in this study adjusted R^2 value which takes into account the loss of degrees of freedom associated with adding extra variables were inferred to see the explanatory powers of the models.

The empirical evidence on the determinants of Ethiopian Private commercial banks' performance is studied based on balanced panel data, where all the variables are observed for each cross-section and each time period.

The study has a time series segment spanning from the period 2001 up to 2017 and a cross section segment which considered six private commercial banks, namely, Awash Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank, United Bank and Nib International Bank.

To test the relationship between these commercial banks performance and selected internal and external determinant variables the following linear regression model is developed.

$$ROA = \beta 0 + \beta 1\ MGE + \beta 2\ LIQ + \beta 3\ BS + \beta 4\ FL + \beta 5 BR + \beta 6 BSD + \beta 7\ GDP + \beta 8 INFL + \varepsilon$$

Where

ROA= return on asset

MGE= Managerial Efficiency

LIQ= Liquidity

BS= Bank size

FL= Financial Leverage

BR= Number of Branches

BSD= Banking sector Development

INF= Inflation Rate (CPI)

GDP =Growth domestic product growth rate

e =be error term

Table 4.6. Result of Ordinary Least Square (OLS) or Linear least square Model

Variable	Coefficient	Prob.
Managerial Efficiency (MGE)	3.150231	0.0000**
Liquidity (LIQ)	-0.783543	0.0708*
Inflation Rate (INFL)	0.005514	0.2194
Gross Domestic Products (GDP)	7.282145	0.0000**
Financial Leverage (FL)	-4.330124	0.0000**
Banking Sector Development (BSD)	-0.598976	0.3259
Bank size (BS)	1.178130	0.0000**
Number of Branches (BRN)	-0.004297	0.0012**
R-squared		0.790722
Adjusted R-squared		0.759806

Source: - Researcher own computation

Note: ** significant at 1%

* Significant at 10%

ROA=-6.572204+3.150231MGE+ 0.783543 LIQ +4.330124FL +1.178130BS + 0.004297BR + 0.598976BSD + 7.282145GDP+0.005514INFL

Table8 shows that the coefficient of liquidity, Financial Leverage, banking sector development and Branch expansion against ROA were negative as far as the coefficients for those variables

are negative (-0.01708), (-0.00000), (-0.3259), and (- 0.0012) respectively. This indicates that there was an inverse relationship between the aforementioned four independent variables and ROA. Thus the increase of those variables will lead to a decrease in ROA. However, the remaining independent variables (managerial efficiency, GDP, Bank size and Inflation rate) are direct relationship with the dependent variable ROA.

The estimation results of the operational panel regression model used in this study are presented in table 8. From table 8 the R-squared statistics and the adjusted-R squared statistics of the model was 79.07% and 75.98% respectively. The result of the R-squared indicates that the changes in the independent variables explain 79.07% of the changes in the dependent variable. That is Managerial Efficiency, Financial leverage, Branch expansion; bank Size, Liquidity, Banking sector development, Inflation rate and Gross Domestic Product collectively, while the result of the adjusted-R squared indicates that the changes in the independent variables explain 75.98% of the changes in the dependent variable. That is Managerial Efficiency, Financial leverage, Branch expansion, bank Size, Liquidity, Banking sector development, Inflation rate and Gross Domestic Product collectively explain 75.98% of the changes in ROA. Although, the remaining 20.93% and 24.02% of the change is explained by other factors which are not included in this study model, so both the R-squared and the Adjusted R-squared values in this study are found to be sufficient enough to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). For panel data, R-Squared greater than 20% is still large enough for reliable conclusions (Nyamsogoro, 2010 cited in Dawit, 2017 and Tesfa, 2015).

4.2.1. ROA and Management efficiency

The regression results of this study indicates that management efficiency was positively and significantly affects the performance of private commercial banks in Ethiopia at 1% significance level (p-value= 0.0000). This implies that the management of Ethiopian private commercial banks deploys (utilizes) their resources efficiently and maximizes their profit. Efficient (optimum) utilization of their resources may result to minimize their operational expenses and increases operational income. Operational income has direct relation ship with performance, as MGE is the ratio of operational income to operational expenses.

Moreover as discussed on the literature review the relationship between management efficiency and Bank performance is positive. Referring to previous studies, the results concerning management efficiency found positive and significant relationship between management efficiency and bank profits, Indranarain (2009), Bourke (1989) and Molyneux and Thornton (1992) found a significant positive relationship between management efficiency and bank profits. This result also in line with efficiency theory which states that bank which operates more efficiently than its competitors gains higher profits resulting from low operational costs.

4.2.2. ROA and Bank size

The second independent variable regression results indicates that bank size was positively and significantly affects the profitability of private commercial banks in Ethiopia at 1% significance level (p-value= 0.0000). The positive coefficient showed that it is linear and significant at 1% level of significance on profitability as it measured by ROA. Large size banks has high capacity to provide operational services, which means that high capacity to lend, ability to use better technology ,better opportunity to close (nearer) to their customers and to retain experienced management members. The natural logarithms of total assets were also incorporated in the model so as to measure whether a change in LOGTA was at decreasing or increasing rate. Therefore, the positive effect of bank size goes up to certain limit beyond that the size variable would shows negative results it is in line with Inverted U-curve hypothesis. Inverted U-curve hypothesis states that profitability will first raise as the bank size increases, eventually level-off overtime, and then begin to fall as the bank becomes extremely large.

As mention on literature review Bank size as measured by Total Assets Smirlock (1985) or total deposits (Civelic and Al-Alami (1991) is one of the control variables used in analyzing performance of the bank system. This study uses natural log of total Asset to analyze the profitability of Ethiopian Private Commercial Banks.

Bank size is the natural logarithm of banks total asset. As it is expected bank size positively and significantly affects the profitability (ROA of private banks in Ethiopia). The result obtained from the regression of this study is inline with the result obtained by previous researchers Devinaga Rasiah (2010), Andreas Dietrich (2014), Muhammad Sajid Saeed (2014) and Samuel

Alemu (2015). The result supports economies of scale theory. Large banks have scale advantage and benefited there by reducing cost.

4.2.3. ROA and Financial Leverage

The regression results of this study indicates that the relation between financial leverage and ROA is negative and significant at 1% level of significant (which means p-value=0.0000). As the uses the variable, debt to total assets ratio was used as proxy for financial leverage in the model, high degree of financial leverage implies high interest payments. It means that due to the bank contains high debt (less portion is capital) pay high interest to debtors, this results to decrease income. According to Pareja (2010) high degree of financial leverage implies high interest payments and financial leverage is the degree to which a company uses fixed items, such as debt and preferred equity. This result also in line with signaling theory which states that Lower leverage indicates that banks perform better than their competitors who cannot raise their equity without further deteriorating the profitability. It shows that inverse relationship with performance.

4.2.4. ROA and Branch Expansion

The regression results of this study indicates that the relation between Branch expansion and ROA is Negative and significant at 1% (p-value=0.0012).This is possibly due to excessive branch expansion of Ethiopian private banks. Currently NBE based on country's Growth and Transformation plan urges to increase their branch by 25% annually and its distribution is 70% city branch and remaining 30% would be outline branches. According to Konzo and Kazumine (2011) adequate levels of branch expansion have positive impacts on both cost and profit efficiencies whereas excessive branch expansion causes a high cost and inversely related with bank's performance. This study also shows that Ethiopian private commercial bank's branch expansion is inversely related with their performance.

Moreover Kazumine (2017) conclude that, regarding the cost performance of regional banks, establishing too many branches and maintaining branch networks that are too large can have negative effects on regional banks.

4.2.5. ROA and Liquidity

Concerning the liquidity risk, the regression results of this study implies that the relation between liquidity risk and ROA is negative and significant at 10% significance level (p-value=0.0708). The variable, liquid assets to total assets ratio was used as a proxy for liquidity in the model. The result indicates that the liquidity variable has negative influence on bank performance. This implies that high figures for this variable mean low performance. Since high figures for this variable denotes low liquidity, higher liquidity is associated with lower profitability. The result is inconsistent with the assertion that holding assets in a highly liquid form tends to reduce income. The result is however in line with the findings of (Al-Qudah et.al 2013; Samuel, 2015) who concluded in their study that liquidity negatively correlates with performance.

4.2.6. ROA and Banking sector development

Concerning the banking sector development, the regression results of this study implies that the relation between banking sector development and ROA is negative and insignificant (p-value=0.3259). The variable, total asset of the industry over real GDP was used as a proxy for banking sector development in the model. The result indicates that the banking sector development variable has a insignificantly negative influence on bank performance. This implies that high figures for this variable mean low performance. Since the richer the country, the more active are all financial intermediaries. The greater the development of a country's banks, the tougher is the competition, the greater is the efficiency, and the lower are the bank margins and profits and low performance. The result is consistent with Demirguc Kunt and Huizinga(1998) they using bank-level data for a large number of industrial and developing countries, present evidence about the impact of financial development and structure on bank performance.

They measure the relative importance of bank or market finance by the relative size of stock aggregates, by relative trading or transaction volumes, and by indicators of relative efficiency. The primary data also reveals as banking sector development has a significant factor that influences Ethiopian banks performance. So, from the findings of the regression analysis one can conclude that as Ethiopian banks profitability is determined by the level of banking sector development. Therefore, banking sector development exists as one determinant factor that can lower influence on Ethiopian private banks profitability in an unfavorable way.

4.2.7. ROA and GDP Growth

Turning to the macroeconomic variables, the researcher observe that real GDP has highly statistical significant and positive impact on ROA at 1% significance level (P-value=0.0000).These results about GDP support the argument of the positive association between economic growth and the commercial Bank's performance. This show as the stimulated Ethiopian economy over the study period creates a new and potential demand for financial services. The results for positive coefficients are similar to the parameters that are observed and revealed by the numbers of researchers e.g. (DemirgucKuntet al.1998), Athanasoglouet al.,(2008), Samuel Alemu (2015) and Moges (2017) concluded that positive and strong correlation existed between economic growth (GDP)and bank performance. This is because the default risk is lower in upturn than in down turn economy and another important point is higher economic growth may lead to a greater demand bearing financial services.

4.2.8. ROA and Inflation

The regression result of this study provides us a positive insignificant value, with a coefficient of 0.005514 and probability value of 0.2194. . This means that as inflation increases by 1% ROA increased by 0.21%. This therefore implies that during the period under study the levels of inflation were anticipated by the Ethiopian commercial banks. As mentioned on literature review the study found a positive relationship between ROA and inflation. This gave them the opportunity to adjust the interest rates accordingly and consequently to have high performance. This is due to the fact that, commercial banks are given discretion to set their lending interest rate freely, and accordingly when they anticipate a high inflation, they adjust their lending interest rate freely and compensate their profitability. The finding of this study is in line with, the findings of Athanasoglou (2008), Samuel (2015), Eden (2014) and Dawit (2017).

CHAPTER FIVE

5. SUMMARY, 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, the chapter is organized in two sections, the first section presents the summary and conclusions of the study and the second section presents the recommendations provided based on the findings of the study.

5.1. Summary and conclusion

The main objective of the study was to identify the main bank-specific, industry-specific and macro-economic factors that can affect Ethiopian banks profitability and to what extent these determinants exert effect on Ethiopian banks profitability. In doing so, previous studies on bank profitability have been reviewed and it is summarized that the profitability of bank is usually expressed as a function of internal and external determinants. The internal determinant refers to the factors originate from bank accounts (balance sheets and income statement accounts) and therefore could be termed bank-specific determinants of profitability. The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. Empirical results from previous studies conclude that internal factors explain a large proportion of banks profitability; nevertheless external factors have also an impact on the performance.

The study results revealed that internal and macroeconomic variables are jointly influenced the performance of banks as measured by ROA. The study also found that the ROA was positively correlated with Managerial efficiency, Bank size, GDP growth and Inflation but the relationship with inflation is insignificant. From the empirical result, all the variables of were in line with theoretical expectations. Considering the p-values, all the other variables were statistically significant except banking sector Development and Inflation. The objective of the study, which was to establish the relationship between bank specific, industry specific and macroeconomic variables and the performance of commercial banks, was therefore met.

Based on the review on previous studies and banking area theories, the present study investigated that the impact of some selected bank-specific, industry-specific and macro-economic factors on the performance of the Ethiopian private commercial banks over the period of 2001 to 2017. The bank specific factors that were used in this study include variables such as Bank size, Number of Branches, liquidity, management efficiency, and financial leverage. On the other hand in this study only one industry-specific variable and two macroeconomic conditions indicator variables were employed (banking sector development, real GDP growth and inflation rate). To comply with the objective of this research, the study also used an appropriate econometric methodology for the estimation of variables coefficient under fixed effect regression models. The quantitative data were mainly obtained from NBE through documentary analysis in order to identify and measure the determinants of banks performance.

For testing the research hypotheses, a sample size of six Ethiopian Private commercial banks were selected and the necessary financial data were collected for the time period of 2001 to 2017. The empirical findings and the primary data results on the impact of bank performance in Ethiopia for the sample suggest the following conclusions.

First, the natural logarithm of total assets (Bank size) has a significant positive impact on ROA. The result implies that larger banks enjoy the higher profit than smaller banks in Ethiopia banking sector because they are exploiting the benefit of economies of scale.

Second, as expected, the result showed a negative relationship between banking sector development and performance with statistical significance, showing that an increase in banking sector development will result in decrease in performance. This is in line with the expectation as a greater the development of a country's banks, the tougher is the competition, the greater is the efficiency, and the lower are the bank margins and profits. The more underdeveloped the stock market, the greater are the bank performance.

Third, the result shows that a negative relationship between Financial Leverage with statistically significance. Financial leverage is the degree to which a company uses fixed items, such as debt and preferred equity. A high degree of financial leverage implies high interest payments. The increase the financial leverage will result in decrease in performance it is in line with signaling theory. According to Ommeren (2011), the signaling theory suggests that a higher capital is a

positive signal to the market value of a bank. Lower leverage indicates that banks perform better than their competitors who cannot raise their equity without further deteriorating the performance.

Fourth, the result shows that a negative relationship between Branch expansion (Number of Branches) with Bank performance statistically significance. If the number Branch branches increase increases its expenses and may incur loss in the short run. Hence it has inverse relation to performance in the short run.

Fifth, the study concludes that though real GDP indicates the economic growth of the country, its increase have a significant positive effect on performance of commercial banks. Annual real GDP growth rate is a measure of total economic activity. It is expected to have an impact on numerous factors related to the demand and supply for banks deposits and loans. GDP growth is expected to have a significant positive relation on bank performance. In this context; the study established a positive influence and the result also show positive and significant influence of real GDP growth rate on commercial banks performance.

5.2. Recommendations

As one can observe from this study, both internal and external factors determine Private commercial banks performance in Ethiopia. Thus, bank managers, directors, and all stakeholders should not only be concerned about internal structures and policies, but also must consider the macroeconomic environment together in designing out strategies to improve their bank performance.

The findings of the study showed that Managerial Efficiency, Financial Leverage, Bank size, Number of Branches and GDP growth rate significantly affect Ethiopian Private commercial banks performance during the study period (2001 to 2017). Hence, focusing and taking the necessary action on these indicators could lead to have better performance and make Ethiopian Private commercial banks competent internationally. Based on the findings of the study the following possible recommendations are forwarded:

- The managers should focus on best utilization of resources and expense management. To increases their managerial efficiency take a necessary actions, like arrange training packages to employees and managements, use better technologies or reengineering their services, avoid unnecessary bureaucracy to reduce their operational expenses.

- The study shows that Bank size has significant and positive impact on bank profitability. Hence the banks should increase their capital by selling shares or by merging. it can be taken as a good signal for commercial banks to merge and to have economies of scale advantage.

- The result shows that Branch expansion (Number of Branches) with Bank profitability negatively and statistically significance. If the number Branch branches increase increases its expenses and decrease their profitability. Hence rather than increasing their branches innovate other alternative to close their services (for instance open sub branch instead of branch) for their potential users.

- Government should implement sustainable macroeconomic policies that will promote sustainable growth, create conducive environment for private banks to be competent

internationally. As Ethiopia needs to be a member of World Trade Organization should open here financial sector market for interested international financial sector participants. It is challenging to close the market for international huge banks for a long time.

- This research study tries to examine the effect of selected bank specific, industry specific and macroeconomics factors on commercial banks performance, but there is other factors which don't included in this study like management philosophy, marketing strategy, unemployment rate and I recommend researchers to conduct investigative study on the impact of such factors.

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Appendices

Appendix: I

Dependent Variable: ROA
Method: Panel Least Squares
Date: 04/27/18 Time: 09:59
Sample: 2001 2017
Periods included: 17
Cross-sections included: 6
Total panel (balanced) observations: 102

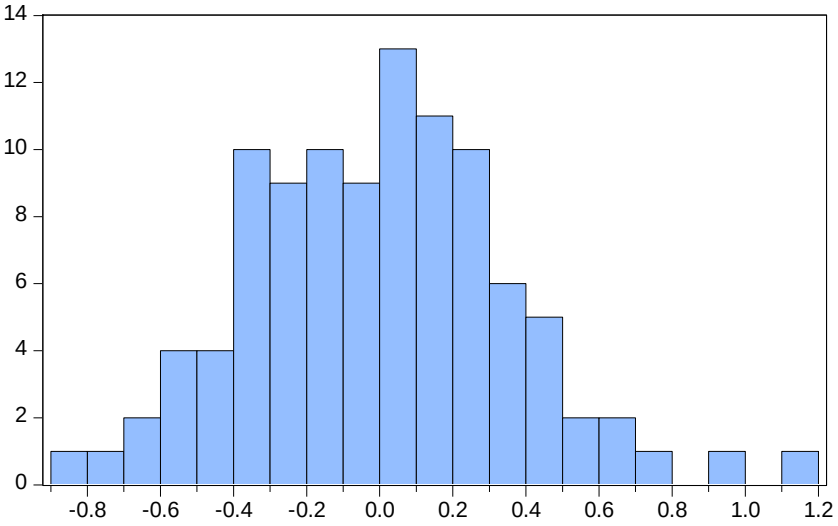
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.572204	2.134429	-3.079139	0.0028
MGE	3.150231	0.682445	4.616096	0.0000
LIQ	-0.783543	0.428378	-1.829092	0.0708
INFL	0.005514	0.004457	1.237030	0.2194
GDP	7.282145	1.277915	5.698456	0.0000
FL	-4.330124	0.953606	-4.540788	0.0000
BSD	-0.598976	0.606317	-0.987893	0.3259
BS	1.178130	0.274714	4.288572	0.0000
BRN	-0.004297	0.001288	-3.336766	0.0012

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.790722	Mean dependent var	2.565049
Adjusted R-squared	0.759806	S.D. dependent var	0.786096
S.E. of regression	0.385263	Akaike info criterion	1.057092
Sum squared resid	13.06161	Schwarz criterion	1.417382
Log likelihood	-39.91167	Hannan-Quinn criter.	1.202985
F-statistic	25.57636	Durbin-Watson stat	1.686374
Prob(F-statistic)	0.000000		

Appendix – II: Tests for Normality: Bera-Jarque test



Series: Standardized Residuals
Sample 2001 2017
Observations 102

Mean	4.35e-18
Median	0.013304
Maximum	1.172210
Minimum	-0.808671
Std. Dev.	0.359615
Skewness	0.316127
Kurtosis	3.361724
Jarque-Bera	2.255005
Probability	0.323841

Appendix – III: Tests for Model Specification: Ramsey Reset Tests

Ramsey RESET Test
Equation: UNTITLED
Specification: ROA C MGE LIQ INFL GDP FL BSD BS BRN
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.465827	92	0.6424
F-statistic	0.216995	(1, 92)	0.6424
Likelihood ratio	0.240298	1	0.6240

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.038250	1	0.038250
Restricted SSR	16.25515	93	0.174787
Unrestricted SSR	16.21690	92	0.176271
Unrestricted SSR	16.21690	92	0.176271

LR test summary:

	Value	df
Restricted LogL	-51.06701	93
Unrestricted LogL	-50.94686	92

Unrestricted Test Equation:
Dependent Variable: ROA
Method: Least Squares
Date: 04/27/18 Time: 10:05
Sample: 2001 2102
Included observations: 102

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.060912	5.863307	-0.863150	0.3903
MGE	1.556320	1.362086	1.142601	0.2562
LIQ	-0.365548	0.419624	-0.871131	0.3860
INFL	0.004585	0.004938	0.928591	0.3555
GDP	5.905824	3.222777	1.832527	0.0701
FL	-2.544823	2.360844	-1.077929	0.2839
BSD	-0.381803	0.707074	-0.539976	0.5905
BS	0.880405	0.839203	1.049096	0.2969
BRN	-0.003008	0.003066	-0.981136	0.3291
FITTED^2	0.055413	0.118957	0.465827	0.6424

R-squared	0.740166	Mean dependent var	2.565049
Adjusted R-squared	0.714748	S.D. dependent var	0.786096
S.E. of regression	0.419846	Akaike info criterion	1.195036
Sum squared resid	16.21690	Schwarz criterion	1.452387
Log likelihood	-50.94686	Hannan-Quinn criter.	1.299246
F-statistic	29.11920	Durbin-Watson stat	1.371694
Prob(F-statistic)	0.000000		

Appendix –IV: Tests for the autocorrelation: Breusch-Godfrey

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.713627	Prob. F(4,87)	0.1542
Obs*R-squared	7.376366	Prob. Chi-Square(4)	0.1173

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/04/18 Time: 11:30
Sample: 2002 2102
Included observations: 101
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.657941	1.947192	-0.337892	0.7363
ROA(-1)	-0.084671	0.108101	-0.783257	0.4356
MGE	0.258365	0.585217	0.441485	0.6600
LIQ	-0.074297	0.389908	-0.190550	0.8493
INFL	0.000458	0.004666	0.098198	0.9220
GDP	-0.300290	1.362727	-0.220359	0.8261
FL	-0.440027	0.970613	-0.453350	0.6514
BSD	-0.076582	0.543469	-0.140913	0.8883
BS	0.126672	0.276305	0.458451	0.6478
BRN	-0.000434	0.001395	-0.311251	0.7564
RESID(-1)	0.111642	0.150081	0.743877	0.4590
RESID(-2)	0.258882	0.110770	2.337114	0.0217
RESID(-3)	0.085696	0.111862	0.766089	0.4457
RESID(-4)	-0.077000	0.109404	-0.703818	0.4834

R-squared	0.073033	Mean dependent var	4.99E-16
Adjusted R-squared	-0.065479	S.D. dependent var	0.389466
S.E. of regression	0.402015	Akaike info criterion	1.143361
Sum squared resid	14.06060	Schwarz criterion	1.505853
Log likelihood	-43.73973	Hannan-Quinn criter.	1.290108
F-statistic	0.527270	Durbin-Watson stat	1.922121
Prob(F-statistic)	0.901806		

Appendix – V: Tests for the Heteroskedasticity Test:

Heteroskedasticity Test: White

F-statistic	0.720041	Prob. F(44,57)	0.8705
Obs*R-squared	36.43975	Prob. Chi-Square(44)	0.7838
Scaled explained SS	47.23779	Prob. Chi-Square(44)	0.3417

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/27/18 Time: 10:24
Sample: 2001 2102
Included observations: 102

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.58018	67.42183	0.527725	0.5997
MGE^2	-6.742155	6.729704	-1.001850	0.3207
MGE*LIQ	3.334339	5.939674	0.561367	0.5767
MGE*INFL	0.054820	0.088677	0.618200	0.5389
MGE*GDP	-6.296764	20.43131	-0.308192	0.7591
MGE*FL	0.445778	14.34506	0.031075	0.9753
MGE*BSD	-7.767704	14.23955	-0.545502	0.5875
MGE*BS	0.789788	4.861709	0.162451	0.8715
MGE*BRN	0.041932	0.063182	0.663681	0.5096
MGE	-4.387042	39.16307	-0.112020	0.9112
LIQ^2	-0.634127	3.092469	-0.205055	0.8383
LIQ*INFL	0.034649	0.038061	0.910353	0.3665
LIQ*GDP	-20.77817	22.39065	-0.927984	0.3573
LIQ*FL	-6.659694	10.97349	-0.606889	0.5463
LIQ*BSD	6.130890	8.462966	0.724438	0.4718
LIQ*BS	-1.354824	3.597698	-0.376581	0.7079
LIQ*BRN	-0.004093	0.021792	-0.187806	0.8517
LIQ	17.44528	27.22402	0.640805	0.5242
INFL^2	0.000484	0.000683	0.709573	0.4809
INFL*GDP	0.078654	0.225774	0.348375	0.7288
INFL*FL	0.092884	0.117294	0.791892	0.4317
INFL*BSD	-0.022942	0.122162	-0.187802	0.8517
INFL*BS	-0.025284	0.042297	-0.597764	0.5524
INFL*BRN	4.38E-05	0.000493	0.088656	0.9297
INFL	0.110065	0.313232	0.351384	0.7266
GDP^2	3.146262	64.45563	0.048813	0.9612
GDP*FL	42.40484	34.82583	1.217626	0.2284
GDP*BSD	28.12246	71.16754	0.395158	0.6942
GDP*BS	-9.602557	9.114180	-1.053584	0.2965
GDP*BRN	-0.085273	0.290109	-0.293934	0.7699
GDP	62.48837	71.01488	0.879934	0.3826
FL^2	3.195530	16.28527	0.196222	0.8451
FL*BSD	25.65889	14.76806	1.737458	0.0877
FL*BS	-8.982669	6.178516	-1.453855	0.1515
FL*BRN	-0.021857	0.036954	-0.591470	0.5565
FL	73.82540	40.92807	1.803784	0.0766
BSD^2	6.713141	8.436951	0.795683	0.4295
BSD*BS	-12.13130	7.565210	-1.603564	0.1143
BSD*BRN	-0.008821	0.033081	-0.266636	0.7907
BSD	94.87092	69.54119	1.364241	0.1779
BS^2	1.399429	1.208439	1.158047	0.2517
BS*BRN	0.019260	0.032570	0.591322	0.5566
BS	-16.31691	17.54661	-0.929918	0.3563
BRN^2	-3.36E-05	8.05E-05	-0.417031	0.6782
BRN	-0.173348	0.288225	-0.601434	0.5499

R-squared	0.357252	Mean dependent var	0.159364
Adjusted R-squared	-0.138904	S.D. dependent var	0.282826
S.E. of regression	0.301830	Akaike info criterion	0.742528
Sum squared resid	5.192789	Schwarz criterion	1.900604
Log likelihood	7.131063	Hannan-Quinn criter.	1.211473
F-statistic	0.720041	Durbin-Watson stat	2.383114
Prob(F-statistic)	0.870522		

Appendix – VI: Tests for multicollinearity

	ROA	MGE	LIQ	INFL	GDP	FL	BSD	BS	BRN
ROA	1								
MGE	0.53585	1							
LIQ	-0.02935	0.14769	1						
INFL	0.48457	0.24339	0.17798	1					
GDP	0.63372	0.24503	-0.06330	0.28159	1				
FL	-0.02933	-0.04532	-0.12558	0.02247	0.17257	1			
BSD	0.37185	0.20310	-0.52748	0.10605	0.20525	0.16319	1		
BS	0.59695	0.35831	-0.32636	0.34790	0.42005	0.36026	0.84554	1	
BRN	0.25136	0.16910	-0.50037	-0.00020	0.19066	0.27054	0.84111	0.80499	1

Appendix –VII Descriptive statistics

	ROA	MGE	LIQ	INFL	GDP	FL	BSD	BS	BRN
Mean	2.5650	0.3860	0.4421	11.9235	0.0916	0.7718	0.3476	9.6707	71.8431
Median	2.7410	0.3947	0.4244	9.7000	0.1040	0.7900	0.2592	9.7649	47.0000
Maximum	4.2000	0.6136	0.7820	36.4000	0.1260	0.8800	0.7711	10.6230	316.0000
Minimum	0.4500	0.1789	0.2218	-10.6000	-0.0210	0.6000	0.1405	8.3304	6.0000
Std. Dev.	0.7861	0.0825	0.1388	11.3885	0.0376	0.0591	0.1985	0.5257	67.4228
Observations	102	102	102	102	102	102	102	102	102

	YEAR	GDP	INFL	BSD	FL	LIQ	MGE	BRN	BS	ROA
1	2001	0.074	-0.3	0.1405	0.83	0.4251	0.18	24	8.9577	1.21
1	2002	0.016	-10.6	0.1406	0.84	0.4333	0.2469	25	9.0461	1.397
1	2003	-0.021	10.9	0.1627	0.83	0.4768	0.4257	29	9.1465	1.107
1	2004	0.117	7.3	0.1729	0.84	0.5084	0.4516	32	9.248	2.14
1	2005	0.126	6.1	0.1897	0.87	0.4464	0.3691	35	9.3475	1.71
1	2006	0.115	10.6	0.1944	0.87	0.3619	0.3991	40	9.4704	2.64
1	2007	0.118	15.8	0.2127	0.81	0.3625	0.3746	47	9.5832	2.768
1	2008	0.112	25.3	0.2345	0.8	0.4766	0.4066	52	9.683	2.963
1	2009	0.1	36.4	0.2592	0.77	0.6422	0.421	61	9.8077	2.226
1	2010	0.106	2.8	0.2901	0.77	0.6621	0.5583	64	9.90001	3.116
1	2011	0.114	18.1	0.3705	0.77	0.5228	0.5745	69	10.005	3.397
1	2012	0.087	34.1	0.449	0.77	0.3434	0.398	72	10.0769	3.304
1	2013	0.098	13.5	0.4997	0.84	0.2847	0.402	102	10.172	3.416
1	2014	0.103	8.1	0.5943	0.67	0.2727	0.3893	181	10.2455	3.5
1	2015	0.104	7.7	0.6723	0.77	0.2654	0.4145	207	10.3778	2.9
1	2016	0.08	9.7	0.7711	0.87	0.2879	0.4059	240	10.4934	2.6
1	2017	0.109	7.2	0.5543	0.88	0.2901	0.4012	316	10.623	2.8
2	2001	0.074	-0.3	0.1405	0.81	0.4018	0.3214	22	9.0414	1.45
2	2002	0.016	-10.6	0.1406	0.8	0.4274	0.3304	23	9.172	1.39
2	2003	-0.021	10.9	0.1627	0.81	0.4004	0.3881	28	9.2991	1.1
2	2004	0.117	7.3	0.1729	0.81	0.4004	0.3906	31	9.4276	2.14
2	2005	0.126	6.1	0.1897	0.83	0.3604	0.3077	34	9.534	2.49
2	2006	0.115	10.6	0.1944	0.81	0.3112	0.3406	37	9.6576	2.4
2	2007	0.118	15.8	0.2127	0.8	0.3438	0.3402	42	9.7811	2.66
2	2008	0.112	25.3	0.2345	0.78	0.4739	0.3729	47	9.8937	2.66
2	2009	0.1	36.4	0.2592	0.81	0.5934	0.4246	52	9.9882	2.89
2	2010	0.106	2.8	0.2901	0.82	0.518	0.4995	58	10.0918	2.623
2	2011	0.114	18.1	0.3705	0.81	0.5258	0.5292	64	10.1661	3.074
2	2012	0.087	34.1	0.449	0.8	0.4105	0.4797	107	10.2435	3.722
2	2013	0.098	13.5	0.4997	0.8	0.3824	0.4382	117	10.2955	3.073
2	2014	0.103	8.1	0.5943	0.81	0.3545	0.3925	133	10.3417	3.42
2	2015	0.104	7.7	0.6723	0.8	0.3625	0.4023	156	10.3938	3.12
2	2016	0.08	9.7	0.7711	0.8	0.3821	0.4101	220	10.456	2.73
2	2017	0.109	7.2	0.5543	0.8	0.3925	0.4105	303	10.5393	2.84
3	2001	0.074	-0.3	0.1405	0.73	0.7425	0.1789	13	8.9523	1.45
3	2002	0.016	-10.6	0.1406	0.79	0.7513	0.1875	13	9.0577	1.39
3	2003	-0.021	10.9	0.1627	0.81	0.6028	0.2346	14	9.1248	0.45
3	2004	0.117	7.3	0.1729	0.8	0.5451	0.2114	18	9.2	2.14
3	2005	0.126	6.1	0.1897	0.79	0.5595	0.3092	21	9.3132	2.49
3	2006	0.115	10.6	0.1944	0.77	0.4861	0.25	25	9.4524	2.4
3	2007	0.118	15.8	0.2127	0.8	0.4919	0.2434	29	9.5309	2.66
3	2008	0.112	25.3	0.2345	0.81	0.5671	0.2735	43	9.6304	2.66

3	2009	0.1	36.4	0.2592	0.82	0.6874	0.3185	46	9.7385	2.8
3	2010	0.106	2.8	0.2901	0.82	0.6931	0.4416	49	9.7979	3
3	2011	0.114	18.1	0.3705	0.83	0.5868	0.398	55	9.862	3.3
3	2012	0.087	34.1	0.449	0.82	0.4236	0.312	70	9.9159	3.13
3	2013	0.098	13.5	0.4997	0.84	0.2557	0.3251	89	10.0055	3
3	2014	0.103	8.1	0.5943	0.81	0.2501	0.3413	100	10.0522	4.2
3	2015	0.104	7.7	0.6723	0.81	0.2503	0.331	176	10.1357	2.3
3	2016	0.08	9.7	0.7711	0.81	0.2587	0.3501	185	10.226	2.4
3	2017	0.109	7.2	0.5543	0.82	0.2465	0.3968	233	10.4035	2.7
4	2001	0.074	-0.3	0.1405	0.77	0.4657	0.3513	20	8.7657	0.89
4	2002	0.016	-10.6	0.1406	0.8	0.4841	0.3448	20	8.8102	0.929
4	2003	-0.021	10.9	0.1627	0.79	0.415	0.3731	23	8.9489	1.237
4	2004	0.117	7.3	0.1729	0.77	0.3978	0.4	23	9.0569	2.807
4	2005	0.126	6.1	0.1897	0.8	0.3794	0.4667	27	9.2084	2.97
4	2006	0.115	10.6	0.1944	0.79	0.2996	0.4545	32	9.3539	3.143
4	2007	0.118	15.8	0.2127	0.78	0.3704	0.4219	38	9.5416	3.218
4	2008	0.112	25.3	0.2345	0.72	0.5396	0.4465	43	9.6154	3.366
4	2009	0.1	36.4	0.2592	0.73	0.7082	0.5053	48	9.7091	3.529
4	2010	0.106	2.8	0.2901	0.68	0.7434	0.5628	50	9.7591	3.89
4	2011	0.114	18.1	0.3705	0.74	0.7066	0.6136	60	9.9064	4.01
4	2012	0.087	34.1	0.449	0.69	0.5106	0.4802	65	9.9215	4.028
4	2013	0.098	13.5	0.4997	0.73	0.3388	0.3849	79	10.0168	3.303
4	2014	0.103	8.1	0.5943	0.74	0.3324	0.4412	95	10.0509	2.8
4	2015	0.104	7.7	0.6723	0.72	0.3295	0.4013	116	10.1371	2.8
4	2016	0.08	9.7	0.7711	0.72	0.3285	0.4301	161	10.2092	2.5
4	2017	0.109	7.2	0.5543	0.75	0.3202	0.3809	213	10.3211	2.4
5	2001	0.074	-0.3	0.1405	0.6	0.4258	0.2417	9	8.3304	1.12
5	2002	0.016	-10.6	0.1406	0.6	0.4427	0.2917	9	8.4969	1.274
5	2003	-0.021	10.9	0.1627	0.61	0.446	0.3871	11	8.6712	1.066
5	2004	0.117	7.3	0.1729	0.79	0.4669	0.413	14	8.8287	1.039
5	2005	0.126	6.1	0.1897	0.81	0.4814	0.4945	16	9.0306	2.889
5	2006	0.115	10.6	0.1944	0.76	0.3718	0.4365	23	9.2038	2.752
5	2007	0.118	15.8	0.2127	0.71	0.4847	0.3646	33	9.3391	2.932
5	2008	0.112	25.3	0.2345	0.75	0.608	0.3881	35	9.5119	2.801
5	2009	0.1	36.4	0.2592	0.78	0.782	0.391	40	9.6676	2.012
5	2010	0.106	2.8	0.2901	0.8	0.7739	0.5084	43	9.7706	2.959
5	2011	0.114	18.1	0.3705	0.78	0.6951	0.4626	50	9.8879	3.001
5	2012	0.087	34.1	0.449	0.77	0.4847	0.3763	58	9.9438	3.39
5	2013	0.098	13.5	0.4997	0.81	0.3675	0.3361	73	9.999	2.142
5	2014	0.103	8.1	0.5943	0.76	0.3535	0.3545	94	10.0706	2
5	2015	0.104	7.7	0.6723	0.82	0.3532	0.3363	127	10.1572	2
5	2016	0.08	9.7	0.7711	0.79	0.3429	0.4215	161	10.2373	2
5	2017	0.109	7.2	0.5543	0.81	0.3411	0.4012	205	10.3405	2.1

6	2001	0.074	-0.3	0.1405	0.62	0.4713	0.3612	6	8.5263	1.8
6	2002	0.016	-10.6	0.1406	0.65	0.4785	0.3556	8	8.7275	2.434
6	2003	-0.021	10.9	0.1627	0.66	0.4712	0.4394	11	8.9469	1.469
6	2004	0.117	7.3	0.1729	0.67	0.4925	0.3978	15	9.0959	2.807
6	2005	0.126	6.1	0.1897	0.71	0.4665	0.3852	18	9.2385	2.656
6	2006	0.115	10.6	0.1944	0.72	0.3588	0.3354	19	9.3068	2.861
6	2007	0.118	15.8	0.2127	0.68	0.3756	0.2933	28	9.4161	2.915
6	2008	0.112	25.3	0.2345	0.69	0.4148	0.3367	33	9.5623	3.096
6	2009	0.1	36.4	0.2592	0.69	0.6	0.4047	43	9.6819	3.204
6	2010	0.106	2.8	0.2901	0.72	0.5764	0.5215	45	9.776	3.366
6	2011	0.114	18.1	0.3705	0.71	0.4767	0.4931	52	9.8519	3.459
6	2012	0.087	34.1	0.449	0.73	0.3726	0.429	58	9.9178	3.456
6	2013	0.098	13.5	0.4997	0.74	0.232	0.2736	73	9.9612	2.559
6	2014	0.103	8.1	0.5943	0.74	0.2311	0.3658	92	10.0313	2.94
6	2015	0.104	7.7	0.6723	0.78	0.2287	0.4122	115	10.1224	2.78
6	2016	0.08	9.7	0.7711	0.78	0.2218	0.4015	155	10.1995	2.64
6	2017	0.109	7.2	0.5543	0.78	0.2285	0.3985	194	10.3226	2.45