Determinant of Non-interest Income of Commercial Banks in Ethiopia

A Thesis Submitted the School of graduate studies of Jimma University in Partial Fulfillment of the award of the Degree of Master of Development Economics

By:

GEREMEW DERIBEW MELKE

Main Adviser:

Mr. TESFAYE MELAKU (Assistance Professor)

Co-adviser

Mr. MOHAMMEDSANI ALI

JIMMA UNIVERSITY

COLLEGE OF BUSINESS & ECONOMICS

DEVELOPMENT ECONOMICES PROGRAM

JULY 05, 2020

JIMMA, ETHIOPIA

Declaration

I hereby declare that this thesis entitled "Determinant of Non-interest Income of Commercial Banks in Ethiopia", has been carried out by me under the guidance and supervision of Mr. Tesfaye Melaku (Assistance Professor) and Mr. Mohammedsani Ali.

This thesis is original and has not been submitted for the award of degree of diploma any university or institution.

Researcher's Name	Date	Signature
Geremew Deribew Melke	July 05, 2020	_____

Certification

This is to certify that the thesis "Determinant of Non-interest Income of Commercial Banks in Ethiopia" submitted to Jimma University for the award of Masters of Development Economics and is the record of bona fide research work carried by Mr. Geremew Deribew Melke, under our guidance and supervision.

Therefore we hereby declare that no part of this thesis has been submitted to any other university for the award of and degree of diploma.

Main Adviser Name	*Date*	*Signature*
Mr. TESFAYE MELAKU (Assistance Professor)	_____	_____
Co-Advisor Adviser Name	*Date*	*Signature*
Mr. MOHAMMEDSANI ALI	_____	_____

Abstract

This study presents an analysis of Ethiopian commercial banks non-interest income earning decision. The objective of the study is to show the determinant of non-interest income earning of commercial banks in Ethiopia by considering bank specific characteristics and macroeconomic factors. For this purpose, the study conducted on six commercial banks selected by purposive sampling technique which is based on secondary source of data collected from National Bank of Ethiopia. The study used random effect model of regression technique, correlation analysis and descriptive statistic. The dependent variable used for the study is non-interest income of commercial banks in Ethiopia and Bank size; capital asset ratio; loan asset ratio and GDP are considered as independent variable. The empirical result of the study shows that bank size, capital asset ratio and GDP positively affect the non-interest income of commercial banks and loan asset ratio affect negatively the non-interest income earning of commercial banks in Ethiopia. The three independent variables bank size, GDP and loan asset ratios have statistically significant impact on non-interest income earning of commercial banks in Ethiopia at 5% of significance level but capital asset ratio has statistically insignificant even at 10% significance level. Finally the study recommended that decision makers on non-interest income earning of commercial banks in Ethiopia should increase their capital and asset position. Also they should understand and absorb some revenue from growth of real GDP of the country through diversifying their non-interest income earning base. Even though it has no sense on decreasing conventional banking activity or landing, decision makers should consider maximizing of their risk less income earning from other non-conventional activity or non-interest income earning will be decline.

Key Words: bank's size, commercial banks, macroeconomic factor, non-interest income

Acknowledgement

First and foremost my very special thanks go to the lord Jesus cries for giving me the motivation, skill and discipline to make it successful. I would like to extend my heartfelt appreciation and gratitude to my main advisor Mr. Tesfaye Melaku (Assistance professor) and Co-advisor Mr. Mohammedsani Ali, for their guidance in shaping my knowledge, encouragement and very valuable comments to write my study.

I would like to add my special thanks to my lovely family, my sister W/t Endalech Deribew, and, my carrying mother Abebech Gibo, they had been always my motivation source by believing in me and giving courage to me all the time, last but not least to my lovely Friends, Ato Asaye Busho and Tafesse Alemu, and CBE Bonga branch staffs, for their patience, because I am using their time during the whole process of my MSC.

Finally, I would like to add my special note of admiration & gratitude to my families & friends whose names are not listed above, without their moral support and encouragement; it would difficult to be successful in this regard.

List of tables

Table 3.1 The expect signs of explanatory variables 24
Table 5.1 Summary of finding of explanator varaiables sign 35

List of Figures

Figure 2.1 Conceptual framework 19
Figure 4.1 RE Regression result of STATA 13 out pout 30

List of Graphs

Graph 1.1 Trand of Interet and Non-interest income of commercial banks 5
Graph 4.1 Relationship between bank assets and non-interest income 32
Graph 4.1 Relationship between real GDP and non-interest income 33
Graph 4.1 Relationship between bank capital and non-interest income 34

Table of Contents

Statement of declaration i
Statement of Certification.....ii
Abstract…… ……iii
Acknowledgment……..…iv
List of tables v
List of Figures v
List of Graphs v
Table of contents..... vi
List of Abbreviations viii
Chapter One...……1
1. Introduction..... 1
1.1 Background of banking sector in Ethiopia..... 1
1.1.1 Ethiopian's commercial banking sector and income ……..……..……5
1.2 Statements of the problem ……...……6
1.2.1Research question ……..…....7
1.3 Objective of the study...……..……. ….……8
1.3.1 General Objective……...…….8
1.3.2 Specific Objective …….……. …….…...8
1.4 Research hyphothesis 8
1. 5 Significance of the study 10
1.6 Scope of the study 10
1.7 Limitation of the study 10
1.8 Organization of the study..... 11
CHAPTER TWO 12
2.Review of Related Literatures 12
2.1 Theoretical Literatures..... 12
2.1.1 Income earning activity in banking sector..... 12
2.1.2 Over view of non-interest income..... 15
2.2 Emprical Rewiew..... 18
2.2.1 Deregulation and non-interest income..... 18
2.2.2 Bank size and non-interest income 19
2.2.3 Macroeconomic condition and non-interst income 19
2.3 Conceptual frameworke of the study 20
CHAPTER THREE 21
3.Research Design and Methodology 21
3.1 Research approch 21
3.2 Source of data 21
3.3 Data collection 21
3.4 Data analysis 21

3.5 Model specification 22
3.5.1 Measurment of variables 26
CHAPTER FOUR 26
4.Results and Discussions 26
4.1 Discriptive statistic 26
4.2 Correlation analysis 27
4.3 Choosing rand effect or fixed effect model 27
4.4 Dignostic test of the classical linear regression model 28
4.4.1 Zero mean and constant varince of error term assumption 28
4.4.2 Normality assumption 29
4.4.3 No perfect multicolleneourity assumption 29
4.5 Regression analysis and discussions 30
4.5.1 Bank size and non-interest income 31
4.5.2 Gross domastic product and non-interest income 32
4.5.3 Banks capital and non-interest income 33
4.5.4 Loan asset ratio and non-interest income 34
CHAPTER FIVE 35
5.Conclusion and Recommenadtion 35
5.1 Summary and conclusion 35
5.2 Recommendation 37
5.3 Future research direction 37
References 38
Appendices 41

List of Abbreviations

BOA	Bank of Abssiniya
BLUE	Best Linear Unbiased Estimator
CBE	Central Bank of Ethiopia
DB	Dashen Bank
FEM	Fixed Effect Model
IFB	Interest Free Banking
LDR	Loan-Deposit Ratio
GDP	Gross Domestic Product
NBE	National Bank of Ethiopia
NBFIs	Non-bank financial institutions
NIIR	Non-Interest Income Ratio
OLS	Ordinary Least Square
REF	Random effect model
ROA	Return on Assets
ROE	Return on Equity
USA	United States of America
VIF	Variance Inflation Factor
WB	Wegagen Bank
UN	United Bank

CHAPTER ONE
INTRODUCTION

The purpose of this chapter is to presents the back ground of the study area of non-interest income of commercial banks in Ethiopia, statement of the problem, research objective and research hypothesis. It also gives highlights about the significance of the study, scope and limitation of the study.

1.1 Background of the study

Banks play an important and significant role in an economy growth and their role became more and more vital. As financial intermediary, banks are the most important channel of money circulation between individuals, firms and financial markets. They become the backbone of the economic development. The last few decades shows a rapid trend to globalization of financial market and the formation of globally integrated economy. During these times, financial markets have emerged fatly and financial innovations have been developed rapidly. Banking sector has shown some radical change characterized by: The entry of bank and non-bank financial institutions in to traditional non-traditional banking markets. Also the Banking sector is a means of modern trade and economic development by providing a major source of finance.

Commercial banks which are based on retail banking play a vital role in the economic resource allocation of countries Ongore (2013). The increasing importance of non-interest income, particularly in recent years, has stimulated research on the factors which have impact on its performance. International evidence has shown that bank characteristics as well as environmental factors such as deregulation, globalization, and investment in technology have played a significant part in explaining trends in non-interest income and conventional activity of banks.

In the last two decades studies have beenshown that commercial banks in Sub-Saharan Africa are more profitable than the rest of the world Flamini (2009). The possible reason for the high profitability in commercial banking business in SSA is the existence of huge gap between the demand and the supply of bank service.

Modern banking in Ethiopia was introduced in 1905. At the time, an agreement was reached between Emperor Menelik II and a representative of the British owned National Bank of Egypt

to open a new bank in Ethiopia. February 15, 1906 marked the beginning of banking in Ethiopia history when the first Bank of Abyssinia was started and inaugurated by Emperor Menelik II. It was a private bank whose shares were sold in Addis Ababa and out of Ethiopia such as; New York, Paris, London, and Vienna Birhanu (2012).

In 1931 Emperor Haile Selassie introduced reforms into the banking system and the Bank of Abyssinia was liquidated and reformed as the Bank of Ethiopia, which was fully government owned bank providing central and commercial banking services to Ethiopia until the Italian invasion of 1936. During the Italian invasion, Bank of Italy was formed as legal tender in Ethiopia. In 1943, after Ethiopia regains its independence from fascist Italy, the State Bank of Ethiopia was established, with two departments performing the separate functions of an issuing bank and a commercial bank. In 1963, these functions were formally separated and the National Bank of Ethiopia (the central and issuing bank) and the Commercial Bank of Ethiopia are formed. In the period up to 1974, several other financial institutions emerged including the state owned as well as private financial institution Belayneh (2011).

State owned financial institutions includes; the Agricultural and Industrial Development Bank (Finance state owned enterprises); the Savings and Mortgage Corporation of Ethiopia; the Imperial Savings and Home Ownership Public Association (Provided savings and loan services).In addition, private financial institutions of the time include; the Addis Ababa Bank; the Banco di Napoli and the Banco di Roma.After 1974, the banking business could not move further because of the nationalization of private investments by the socialist regime that came into power leaving only three government banks; the National Bank of Ethiopia, the Commercial Bank of Ethiopia and agricultural and Industrial Development Bank (Mortgage Bank) Birhanu (2012).

New renaissance had been emerged for banking sector development in Ethiopia after the socialist regime was overthrown in 1991. Subsequently, the licensing and supervision of Banking Business Proclamation No.84/1994 was issued in 1994 which led to the beginning of a new era for Ethiopia banking sector. Immediately after the enactment of the proclamation private banking companies began to flourish, leading to 16 private banks and one public owned commercial bank

(excluding the non commercial public owned bank which is Development Bank of Ethiopia) operating in Ethiopia as of the current year 2017.

Five major principal events have been occurred in Ethiopian banking history related to Ethiopia political instability since 1905.The first event was related to establishment of the Bank of Abyssinia in 1906, marking the advent of banking into the country. The second event was fascist Italian invasion in 1936, following liquidation of the Bank of Ethiopia, a broad colonial banking network, extended to encompass all Italian possessions in the Horn of Africa (Eritrea, Ethiopia and Somalia) and closely linked with the metropolitan financial system, was set up in Ethiopia. The third event was, in 1943, establishment of the State Bank of Ethiopia, marking the rebirth of the Ethiopian independent banking. This occurred during World War II after liberation of the country from fascist Italy. The fourth event was the revolution of 1974, which wiped out the monarchy, nationalized companies and shaped a "socialist banking" two-tier model "suited" to Ethiopia, the whole credit system being based on the central bank and three state owned financial institutions, each of them enjoying monopoly in its respective market. The fifth event was the collapse of socialist regime followed by a financial sector reform and liberalization according to Monetary and Banking Proclamation number 84/1994 Belayneh (2011).

Commercial banks sources of income include interest income, non-interest income and other incomes. Here other income is part of income gained from sundries such as cash surplus, money bag, income from disposal fixed assets which can be included in the non-conventional revenue of Banks'. Interest income is also known as traditional source of income which is earned from giving loan to customers. Most commercial banks in Ethiopia rely significantly on traditional source of income. However this source of income has lost important regulatory protection as new competition has emerged from non-bank financial institutions (NBFIs) which have significantly reduced interest income earned by commercial banks and newly emerging full flagged from conventional banking activities which are the so called interest free banking services (IFB). Individual bank characteristics, technological development, deregulation and globalization has exposed most commercial banks to intense competition from NBFIs necessitating commercial banks to look for other sources of income other than depending on interest incomes only (DeYoung and Rice 2000). Therefore most commercial banks have decided to diversify their

sources of income mainly to non-interest income so as to maintain their profitability and to ensure their financial stability in the competitive market.

Theoretically, expanding nontraditional source of bank revenue is preferred because service fees and other non-interest income are not related with traditional interest income. Therefore income diversification on non-interest income leads to a more stable net operating income and better risk adjusted financial performance. However existing empirical studies on the effect of diversification in banking do not clearly support the theoretically expected benefits of diversification. This study will examine the factors that affect non-interest income commercial banks in Ethiopia.

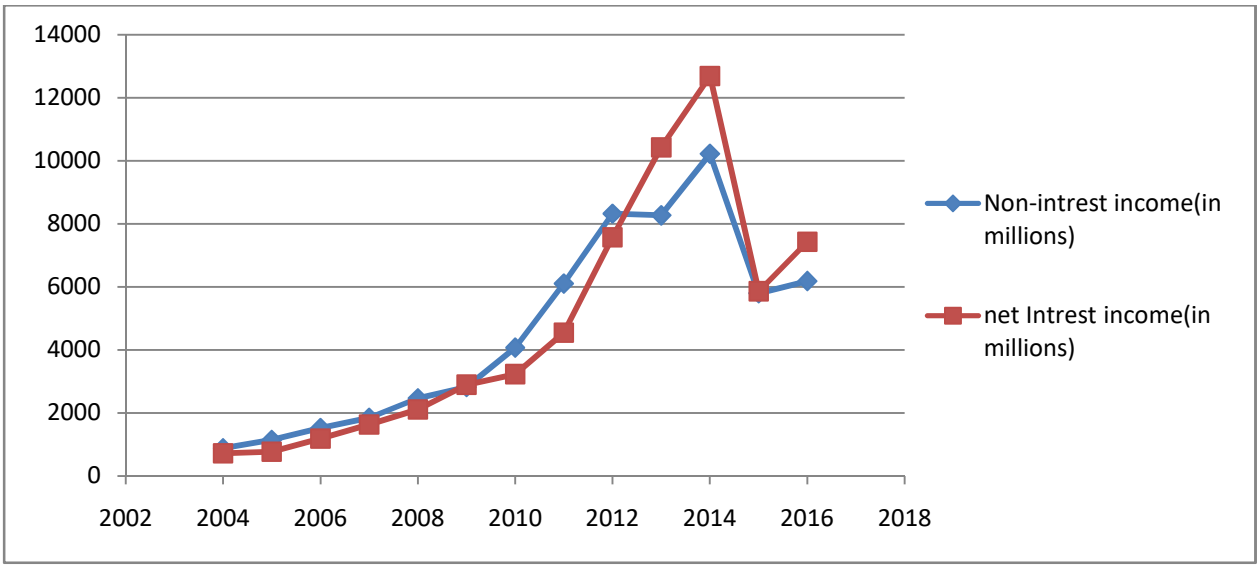
The performance of any commercial banks can be affected by internal and external factors. These factors can be classified into bank specific (internal) and macroeconomic variables. The internal factors are individual bank characteristics which affect the bank's performance. These factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks. The internal determinants include bank specific financial ratios representing capital adequacy, cost efficiency, liquidity, asset quality, and size. Economic growth, inflation, market interest rates and ownership are external determinants that affect bank profitability.

Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou, Brissimis and Delis, 2005). Therefore, it is important to understand the determinants of banking sector profitability. As macroeconomic, and legal environment changes, determinants of profitability banking sector might change as well. As such, an understanding of determinants of their profitability and the drivers of bank profitability for that matter is essential and crucial to the stability of the economy. However, substantial amount of studies have not been conducted to investigate the status of bank profitability as well as the determinants of profitability of the Ethiopian banking system.

1.1.1 Ethiopian's commercial banking sector and non-interest income

Non-interest income is defined as the income that commercial banks earn from other sources outside their traditional lending operations or revenue that banks earn from other operations apart from their core intermediation services. Non-interest income includes; local money transfer charge or fees, custody fees, financial advice fees, hard currency exchange, international export and import related fees and charges, local and international guarantee, funds management fees and commission earned and so on. Non-interest income sources can be originated from three main banks' function of intermediation that includes; origination, service and portfolio management Belayneh (2011).

Banks have reacted to loan origination fees and other sources of none loan activities by diversifying their products toward non-interest income through investing in financial markets and selling mutual funds. In the recent commercial years most banks in Ethiopia showed an increase in non-interest income.



Source: Researcher's computation (2020)

Graph 1.1 Trend of interest and non-interest income of Commercial banks in Ethiopia

The graph 1.1 tried to show the trend of growth of the non-interest income of commercial banks in Ethiopia .From the above trend any one can understand that the increasing experience on low cost of risk related non-interest income of Ethiopian commercial banks. This shows that the advantage of searching alterative source to sustain the profitability and minimize risk of loan

related income. Thus commercial banks compelled to look for other sources of income that would ensure stability in revenue and also mitigate themselves from risk exposure (Kiweu, 2012). When a firm diversifies its revenue sources it will be able to reduce the risks it faces, but this will depend on the correlation between different lines of investments and prices of different investment. Therefore it is out of this argument that most banks have diversified their revenue sources through value adding activities such as service charges, fees, commissions and foreign exchange dealings (DeYoung and Roland, 2001).

1.2 Statement of the problem

Domestic financial sector liberalization in Ethiopia, newly establishing interest free banking and technological development are challenge to commercial banks to sustain their competitive advantage on interest income earning and it has made easier for banks to generating income from non-interest income activities. This has compelled commercial banks to diversify to other sources of income instead of depending on the traditional interest income. The effect of some bank specific factors on non-interest income diversification is a controversial issue among various empirical studies. For instance, the effect of capital adequacy on non-interest income diversification has shown positive which means that banks with adequate capital tries to expand their operation and this resulted to increases their non-interest income (Landi, Venturelli, and Berengario 2001). On the other hand, some empirical studies done in USA commercial banks DeYoung and Rice (2004), supported the negative effect of capital adequacy on non-interest income by arguing that banks diversify their income sources by maximizing their non-interest income to leverage their capital.

Commercial banks have diversified and expanded their income earning activities towards non-interest income such as foreign exchange dealing, international trade facility and investing in the money market like accepting and issuing national and international guarantees. Because these sources of income can be used to offset default risks that are associated with interest incomes which are susceptible to economic recession and business activities. DeYoung and Rice (2004) argue that fee based activities reap abnormal returns in the short run which can help and insure commercial banks from their earnings instability.

Studies conducted in Ethiopia by Tesfaye (2018) and Tigist (2013) focused on the impact of diversification on financial performance and profitability of commercial banks. Also the determinants of profitability of Ethiopian commercial banks had been examined by Belayneh (2011) by employing the variables like; capital, bank size, loan and advance, saving deposit, fixed deposit, non interest income, non- interest expenses and credit risk as bank–specific; market concentration as industry – specific variable and economic growth, saving interest rate and inflation as macroeconomic variable. Berihun (2012) has also examined the effect of bank-specific, industry-specific and macroeconomic determinants of Ethiopian commercial banking industry profitability.

However various studies such as Tesfaye (2018), Tigist (2013) and Belayneh (2011) have already been done on this matter, up to my understanding, there is a gap of analyzing the main determinant of past trends of non-interest income of commercial banks in Ethiopia by relating the real impact of bank characteristics and real GDP growth. Also past studies do not reveal what exactly determines non-interest income and its growth in the total percentage share of commercial banks gross income all focus on the diversification of non-interest incomes of commercial banks.

Thus this study seek to add some knowledge on the main cause of increasing trend of none-interest income of commercial banks in Ethiopia by analyzing the impact of bank characteristics and macro-economic condition. Also this study is tried to link non-interest income to the total assets of commercial banks and relate profit and loss item (non-interest income) to the balance sheet item (total assets). This study is targeted to assist commercial banks in identifying their strategies to increase their non interest income earning through filling the gap of understanding on the relationship between GDP growth and non-interest income earning.

1.2.1 Research questions

The main question that the research is tried to answer is what exactly determines non-interest income and its growth of Ethiopia in the last decade. With specific questions being:

- What is the effect of bank characteristic and market size on non-interest income of commercial banks?
- What is the effect macro-economic change on non-interest income of commercial banks?

1.3 Objectives of the study

1.3.1 General Objective

The general objective of this study is to show the main determinants of non-interest income of commercial banks in Ethiopia.

1.4.2 Specific Objectives

- To analyze the effect of increasing bank asset on the profitability of commercial banks.
- To show the role of capital on non-interest income earning.
- To evaluate the effect of loan expansion on non-interest income earning of commercial banks in Ethiopia.
- To explain the impact of real GDP growth on non-interest income of commercial banks
- To provide policy recommendation based on the findings

1.4 Research hypothesis

The main target of this thesis is to examine the determinants of non-interest income of commercial banks in Ethiopia. The empirical studies done in various countries provide different results on this issue. Different literatures review show that there is no common agreement on the sign of coefficients of estimate of some selected variables of commercial banks specific and macroeconomic variables. Studies conducted in different countries on determinants of non-interest income growth of commercial banks in Ethiopia explanatory variables are bank size, capital asset ratio, loan asset ratio, and GDP. Therefore, the researcher has developed below explained hypothesis to estimate the significance of the relationship between bank specific characteristics, and GDP variables with non-interest income of commercial banks in Ethiopia.

Bank size has significantly positive effect on non-interest income because big banks have advantage of income diversification than the small banks. Large banks have relatively better customers' relationship and good trust. Joon-Ho Hahm (2008) study showed that relatively owners of large assets can easily diversify aggressively to non-conventional revenue source which lead them the share of non-income increases than small banks. Thus the following hypothesis if formulated;

Ho: Bank size has a negative effect on non-interest income.

Ha: Bank size has a appositive effect on non-interest income.

Capital asset ratio is used to measure the impact of deregulation on the growth of non-interest income in commercial banks. Studies such as De Yong and Rise (2004) and Isik and Hassan (2003) indicated that financial performance of banks relative to core deposit as the share of total asset and bank return on assets minus the average return on asset are also used as proxy for deregulation in previous studies. Empirical evidence is compounded. Thus, the predict sign between deregulation and non-interest income is indeterminate. Higher capital ratio linked with high level of deregulation and low capital ratio implies low level of deregulation.

Loan asset ratio is used to estimate the effect of strategic response of commercial banks. Change in total loan and advance to total asset signify that the bank's income strategy based on interest income. On the other hand non-interest income will increase when the bank strategy is to expand its source of income which is suggesting a negative relationship between the loan ratio and the level of non-interest income increase by commercial banks. Empirical studies that support this relationship include Sherene and Bailey (2010), Craigwell and Maxwell(2006) .Thus we expect an inverse relationship between loan to asset ratio and non-interest income of commercial banks .i.e.,

Ho: Loan asset ratio has a negative effect on non-interest income.

Ha: Loan asset ratio has no negative (has positive) effect on non-interest income

Growth domestic product has mixed results in different studies .Banks with robust loaning policy may not it is important to change non-interest income activities since they can expand their earning though interest revenue (Sanya and Wolfe, 2010).

Joon-Ho Hahm (2008) study indicated us fast emerging economies with high GDP rate are likely to show a lesser non-interest income as compared to slow moving economies. This shows that banks are advised toward non-interest income as economic growth slows dawn. Thus we expect inverse relationship between GDP growth and non-interest income. Therefore the postulated hypothesis will be;

Ho: GDP growth has inverse relationship with non-interest income.

Ha: GDP growth has no inverse relationship with non-interest income.

1.5 Significance of the study

There is a lot of pressure in Ethiopia's commercial banks to give focus on their business from traditional interest income to a fee based earning so as to stabilize their lending rates and profitability in the long run. Searching alternative source of income can greatly reduce default risk because as non-interest income increases, banks will shift from lending activities. Previous studies explain the impact of non-interest income on profitability of commercial banks in Ethiopia but do not explain what exactly determines non-interest income diversification at country level. This study will contribute some knowledge to the existing literature in Ethiopia banking related studies because it assists in examining the factors that determine non-interest income so as to rebalance income in the banking sector at Macro level. Such a study has not been fully exploited in Ethiopia and therefore it will assist in shading some light into country level commercial banks factors.

Commercial banks in Ethiopia have been recording fluctuations in their profits over different fiscal years. Thus it is important to banks to exploit alternative strategies to sustain their profitability by expanding diversified sources non-interest income. This study also assists policy makers to draw policies that will create conducive environment for banks to manage their incomes earning to none conventional source of income and reduce pressure on lending rates.

1.6 scope of the study

The conceptual framework of this study is to examine the determinants of non-interest income earning of commercial banks in Ethiopia. Whereas, the geographical scope op this study is to analyze data six selected commercial banks in Ethiopia that were in operation between 2004 to 2017 financial years.

1.7 Limitation of the study

In this study the researcher considers only fourteen fiscal years data i.e. from 2004 to 2017 to analysis the main determinants of non-interest income earning of the six commercial banks. These selected commercial banks are Awash International bank, Bank of Abssinia, Commercial Bank of Ethiopia, Dashen Bank, United Bank and Wogagan Bank. One of the main limitations of this study did not include recent data of the years 2018 and 2019 because of unavailability of data to these two years. In addition, this study assumes that all factors affecting non-interest income earning decision of commercial banks are constant.

1.8 Organization of the study

The study has divided in to five major chapters. The first chapter includes the back ground of the study, statement of the problem, research objective and significance of the study, scope of the study and limitation of the study. The second chapter provides the review of the related literatures. The third chapter presents the research design and methodology of data analysis. The fourth chapter provides analysis of collected data and the last chapter gives the summary of finding, conclusion and recommendation of the finding.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

The purpose of this chapter is to review the literature non-interest income earning diversification. The chapter is organized as two main categories of theoretical and empirical literatures of the study.

2.1 Theoretical literature

2.1.1 Income earning activities in banking sector

Income earning in banking sector refers to having various types of income that is earned through many different activities of banks which can be broken down to two primary components interest income and non-interest incomes sources. In the last few years several banks in all over the world increased their source of income by providing or offering nontraditional banking services. Off balance sheet activities have been expanding at increasing rate (Clark and Siems 2002; Lozano-vivas and Pasiouras 2010). It finds that non-interest income had contributed over 40% of total operational income in U.S. commercial banking industry.

According to Vincent Okoth (2013), bank performance is highly influenced by both internal and external factors. The internal factors are within the scope of the bank and are easy to be manipulated and differ from bank to bank. It includes bank size, capital, management efficiency and risk management capacity Vincent Okoth (2013).Athanasoglou et al, (2006) argued that profitability is a function of internal factors that are mainly influenced by a bank's management decisions and policy objectives such as the level of liquidity, provisioning policy, capital adequacy, expense management and bank size On the other hand external factors are macroeconomic variables such as interest rate, inflation, economic growth and other factors like ownership Vincent Okoth (2013).

It is important to understand the motivation behind these choices because non-traditional banking activities have shouldered a large part of the blame for the 2007-2009 financial crisis, and now face the brunt of regulatory efforts. Large banks across 38 countries result indicated that how the concentration of the banking system impacts the choice of business activities and consequently the stability of banks. Studies show that banks in less concentrated banking

systems (such as in the US and Japan) have higher levels of non-traditional business activities with higher shareholder returns, but at a cost of increased systemic risk. In contrast, the non-traditional business activities in highly concentrated banking systems help reduce the volatility of profits and also increase banks stability.

Theories show that there is not always a one-to-one relationship between non-traditional business activities and global banks stability. The presence of fixed-rate deposit insurance (Keeley, 1990), too-big-too fail subsidies and limited liability corporate structures give bank managers incentives to increase risk taking to extract maximum personal benefits. Besides regulation of banks through setting of capital and interest rate levels (Hellmann, Murdock, and Stiglitz, 2000; Martinez-Miera and Repullo,2010), letting banks earn monopoly rents has been suggested as a way of making banks behave more conservatively. The idea is that banks will want to preserve their charter value and avoid bankruptcy. In support of the view that competition increases bank fragility, the "competition-fragility" hypothesis, Keeley (1990) shows that increased competition between banks in the U.S. in late 1960s and 1970s may have led to increased risk taking and a surge in failure in the 1980s.

Beck, Demirguc-Kunt, and Levine (2006) showed that banking crises are less likely in economies with more concentrated banking systems, using the actual occurrence of a crisis to measure a banking system's stability. Berger, Klapper, and Turk-Ariss (2009) used a different concentration measure called the Lerner index as a proxy for competition in a global sample of 30 developed countries and find that banks with a higher degree of market power are less risky, although they do bear more loan portfolio risk. Besides offering potential benefits, bank diversification can be a source of individual bank instability. On the asset side, some nontraditional activities allow banks to hold relatively low amounts of capital (for example: Acharya, Schnabl, and Suarez, 2012).

The necessity of capital regulations in banks to mitigate moral hazard and increase bank stability has been well established in the literature (Rochet, 1992). Nontraditional business activities may thus offer a channel to circumvent capital regulations and allow increased risk taking by bank managers exacerbating agency issues (Jensen and Meckling, 1976). Another channel for bank instability through nontraditional business activities exists on the funding side

of the balance sheet. The 2007-2009 financial crisis showed that the short term funding of securitized assets held by trading subsidiaries of banks makes them susceptible to modern-day bank runs (Acharya, Gale, and Yorulmazer, 2011; Gorton and Metrick, 2012). Recent empirical research examining the impact of noninterest income on individual bank's risk has not shown that it can yield diversification advantages. DeYoung and Roland (2001) and Stiroh (2004) show that banks in the U.S. with a larger proportion of noninterest income have higher earnings volatility. The results are consistent in an international sample, as DemirgucKunt and Huizinga (2010) finds that risk adjusted profits are reduced with higher levels of non-interest income.

While recognizing that this relationship for individual banks is important, the impact of diversification on the financial system is also important because of the negative externalities associated with bank failure. Ibragimov, Jaffee, and Walden (2011) show that systemic risk can arise when the return distribution of the assets used for diversification have heavy tails and are correlated. Wagner (2010) shows that the effect is mechanical, for as banks diversify their portfolios will begin to overlap and look increasingly. A fall in the value of these similar portfolios can lead to joint failures. These papers point to the fact that while non-interest income may help reduce individual bank risk, it can increase the chance of systemic crisis where many banks fail. In a systemic crisis, a competitor cannot step in and provide the financial services needed.

The theoretical predictions of non-interest income can increase the systemic risk of banks (De Jonghe, 2010; Brunnermeier, Dong, and Palia, 2011). The limited liability structure and favorable treatment of banks by regulators already give banks a risk-shifting incentive. Thus the risk-sharing goal of diversification may instead be transformed to a risk-shifting incentive when banks are faced with competitive pressures. However, in the case where banks have franchise value, banks may be wary of overly risk investments even though they may offer high returns. Facing less competitor pressure in their core lending markets and thereby less shareholder pressure to improve returns, banks may choose safer noninterest income which meets the goals of diversification and reduces systemic risk.

According to (Meier, 2011), non-interest income or fee income can be defined as the earning of the banks that are not directly related to interest generating activities which includes service charges, fiduciary income and service fees. As per (Peter and Sylvia, 2010) non-interest income can be defined as the source of income other than revenues from loans and investments.

Generally, non-interest income related to bank and credit income derived primarily from fees. Examples of non-interest income include deposit transaction fee, insufficient funds, fees, trading fees, monthly account charges, checking and deposit slip fees, among others. Also according to (Brunnermeier, et al 2010) non-interest income components has been categorized into sub-groups namely; trading and securitization fees, investment banking and advisor fees, brokerage commotions, venture capital and fiduciary fees, and gain on non-hedging derivatives.

2.1.2 Over view of non-interest income

Bank's non-interest income is the proceeds mainly from service and penalty charges, asset sales and property leasing, export and import related activities as well as foreign exchange activities. Commercial banks sources of income include interest income, non-interest income and other incomes. However this source of income has lost important regulatory protection as new competition has emerged from non-bank financial institutions which have significantly reduced interest income earned by commercial banks (Atellu, 2014). In his study, Köhler et al., (2013), established that banks with a retail-oriented business model such as savings banks, cooperative banks and other retail-oriented banks become significantly more stable if they increase their share of non-interest income. On contrary, investment-oriented banks become significantly less stable so he recommends that larger and more investment-oriented banks should increase their share of interest income to become more stable. This shows that non-interest income affects bank profitability.

Besides offering potential benefits, banks non-interest income diversification can be a source of individual bank instability. On the asset side, some non-traditional activities allow banks to hold relatively small amounts of capital. Non-interest income activities may thus offer a channel to circumvent capital regulations and allow increased risk taking by bank managers. Non-interest income also can increase the systemic risk of banks but the limited liability structure and favorable treatment of banks by regulators already give banks a risk-shifting incentive. Thus the risk-sharing goal of diversification may instead be transformed to a risk-shifting incentive when banks are faced with competitive pressures. However, in the case where banks have franchise

value, banks may be worry of over risk investments even though they may offer high returns. Facing less competitor pressure in their core lending markets and thereby less shareholder pressure to improve returns, banks may choose safer noninterest income which meets the goals of diversification and reduces systemic risk.

Bank characteristic variables such as interest spread, capital adequacy, size, and liquidity have positive and strong influence in the performance of commercial banks, while management efficiency and asset quality recorded strong and negative association to profitability. Bank size is measured by its assets. Commercial banks should make every effort to increase their size by diversifying their products through investing in for instance, in financial market and selling mutual funds in the market. Size of a firm in general is the speed and extent of growth that is ideal and this growth can be in terms of revenue, profits, assets or number of employees which are all essential for increased financial performance and profitability. Large firms are more likely to manage their working capitals costs and improve on their financial performance efficiently than small firms. Most large firms enjoy economies of scale and thus are able to minimize their performance.

Theoretically factors affecting bank profitability are mainly divided into two categories as internal and external variables. The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. Commercial bank performance is influenced by those internal factors that are related to internal efficiencies and managerial decisions. Such factors include determinants such as bank size, capital adequacy, liquidity risk, operational efficiency (expenses management), management efficiency, employee efficiency and funding cost. On the other hand, bank profitability is a function of external market factors. Accordingly, one of the external factors (variables) that can affect bank profitability is industry specific factors. Such factor mainly includes bank sector development as a major determinant factor of bank profitability. Finally, the macroeconomic factors that can affect bank profitability include factors such as real GDP, foreign exchange rate and inflation rate among others. The exact relationship between these factors and the bank profitability and the significance of the relationship remain as questions to be addressed more specifically in the context of Ethiopian commercial banking sector.

The relationship between non-interest income and profitability of banks has been investigated in many studies. De Young and Roland (2001), examining 472 US commercial banks for the period

from 1988 to 1995, find that higher fee-based (non-interest) activity, increases banks' profitability but also the level of earnings volatility. Similar results were achieved by the investigation of Demirgüç Kunt and Huizinga (2010), who examined 1 344 banks from 101 countries. They found banks with higher non-interest income share more profitable but also more risky. Gürbüz et al. (2013) investigated 26 Turkish deposit banks for the period 2005–2011 and found, that increase of non-interest income is related to increase of risk-adjusted return on assets.

Dietrich and Wanzenried (2011) examined determinants of Swiss banks' profitability. They founded a weak negative relationship between interest income share and profitability. As both types – traditional and wealth-management banks were included in the studies, the authors considered that margins in asset management, belonging to noninterest income, are generally higher than margins on interest-based products. The same authors in their another study (Dietrich, Wanzenried, 2014), where they investigated determinants of commercial banking profitability in 118 countries, found that in low income countries, banks with high share on non-interest income are less profitable, while in countries with middle- and high-income, the tendency is opposite. Saunders et al. (2014), based on observations of 10 341 US banks from 2002 to 2013, found a positive relationship between non-interest to interest income ratio and profitability. It is especially strong during the crisis.

Over the past few years, a shift has been seen in income generation activities of banks .Banks have diverted from their traditional function of intermediation. Many studies in past have attempted to analyze this displacement of banks. Various studies shows that state owned banks were less affected by the macroeconomic conditions thus were effective in credit smoothening during shocks. While the lending behavior of private and foreign banks were not much different from each other. Others investigated the impact of income diversification on performance and risk-adjusted returns are positively related in Italian banks, while for smaller banks which earn small portion of non-interest income are more likely to gain diversification benefits.

Prior empirical papers that have examined whether expanding income base has been beneficial or detrimental to the risk of an individual bank (Saunders and Walter 1994, and DeYoung and Roland 2001 provide detailed literature reviews). While my study focuses on the effect of such diversifying activities on a bank's contribution to systemic risk, the literature on individual bank risk shows mixed evidence.

Acharya, Hassan and Saunders (2006) find diseconomies of scope when a risky Italian bank expands into additional sectors. On the other hand, White (1986) finds that banks with a security affiliate in the pre-Glass Steagall period had a lower probability of default. In samples of international banks, Demurgic-Kunt and Huizinga (2010) find that bank risk decreases up to the 25th percentile of non-interest income and then increases, whereas De Jonghe (2010) finds non-interest income to monotonically increase systemic tail risk.

2.2 Empirical Review

There are four main factors that determine non-interest income in the banking industry, they include market conditions (deregulation), technological development, back characteristics (bank size and bank efficiency) and macro-economic (inflation and economic growth) conditions.

2.2.1 Deregulation and non-interest income

Deregulation can be defined as the removal or simplification of government rules and regulations that constraint the operation of banking market forces. This will in turn stimulate competition in the financial sector leading to efficiency in service delivery. Deregulation and private bank owned banking activity started in Ethiopia after break down of Derg command economy regime and since then, we have seen banks unbundling deposit as they compensate depositors for below the market interest rates by giving different types of other non-interest based services in favor of separate charges for individual retail products (Kiweu, 2012).

Using a panel data analysis, De Young and Rice (2004) studied the effect of deregulation on non-interest income of commercial banks in USA. He used financial performance of a bank relative to its peers over the past three years to proxy for deregulation and found the variable to be statistically significant. He postulates that deregulation enhances competition in the banking sector which will in turn prompt banks to diversify their products so as to stabilize income. This confirms other previous studies by Mnasri and Abaoub (2003), Staikouras and Wood (2003), Isik and Hassan (2003) and Acharya et al. (2002). These studies use capital to assets ratio and core deposit as a share of total assets to proxy for deregulation. They find these variables to be statistically significant with a positive coefficient. The findings are however in sharp contrast with Craigwell and Maxwell (2006) who studied the impact of deregulation using bank relative financial performance which is calculated as bank return on assets minus the average return on

assets of the other bank on non-interest income in Barbados commercial banks using unbalanced panel data. The coefficient of deregulation was found to be insignificant showing that this variable does not affect changes in non-interest income. He argued that banks have not met the ever increasing consumer needs and there has been a very small change in banks activities towards increasing non-interest income. For example, there still appears to be weighty dependence on past book accounts rather than superannuation which is particular to reserve management. Previous studies that arrived at the same findings include Busch and Kick (2009) and Belgrave et al. (2004).

2.2.2 Bank size and non-interest income

Pennathur and Subrah (2012) using unbalanced panel data of one hundred and seventy two banks in India studied the impact of bank ownership structure and size on non-interest income. The study used natural log of bank assets to proxy bank size, and a dummy variable to proxy big, sporadic growths in bank size. The study reveals that income base expansion benefits from non-interest income tend to increase with bank's size and small banks with very small portions of non-interest income record some little significant gains. Comparatively large banks make use of economies of scale in order to dominate the production of consumer loans. In spite of their low unit cost, however, the market for this product is extremely competitive and large banks must complement their revenue stream with non-interest income.

2.2.3 Macro-economic condition and non-interest income

Kiweu (2012) in his study of commercial banks in Kenya found that macro-economic variables also play an equally important role in determining non-interest income in Kenya commercial banks. Macroeconomic variables that have been used in the previous studies include; rate of inflation, changes in gross domestic product, exchange rate volatility and variability in Treasury bill rates. This confirms previous studies by Hahm (2008), Sanya and Wolfe (2010) who used inflation rate, exchange rate volatility and changes in the gross domestic product. Sherene and Bailey (2010) also used panel data to study the impact of foreign exchange volatility and interest rate in determining non-interest income in Jamaican banks for the period 1999-2010. They found the coefficients of these variables to be statistically significant in determining non-interest income. This confirms similar findings by Gorener and Choi (2013) and Yang et al. (2006). The

findings are however in sharp contrast to Lin et al. (2012) who examined the impact of stock market and inflation in determining non-interest income using panel data of European banks.

2.3 Conceptual Framework of the Study

From the literature review discussed above, the researcher developed the following conceptual framework to summarize the focus and scope of the study in terms of dependent and independent variables included.

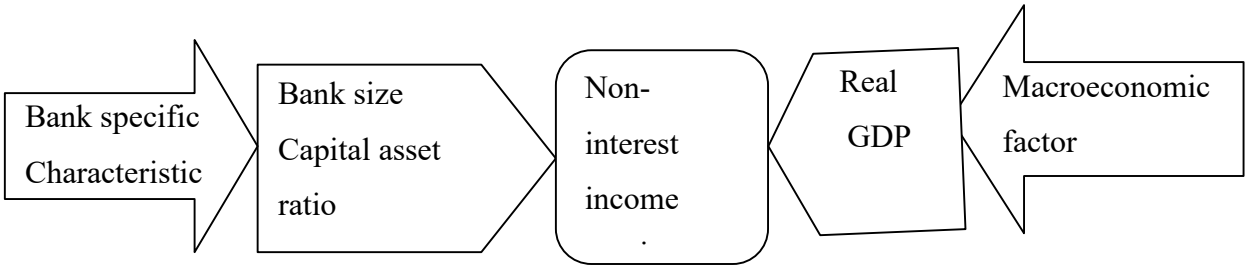


Figure 2.1: Conceptual Framework

Non-interest Income and Bank Size: Bank size can be measured by either the market share of a bank which is estimated by dividing individual banking assets by the total assets of the banking industry or the natural logarithm of individual banking total asset. Theoretically and empirically, (Joon-Ho Hahm 2008) find that banks with relatively large asset sizes, tend to earn their revenue sources more aggressively by increasing their non-interest income bases.

Non-interest Income and capital asset ratio: The capital asset ratio is calculated as the ratio of book value capital to total assets. The relationship between capital and non-interest income should give some implication on interest for banks to move in to non-traditional business.

Non-interest Income and Loan asset ratio: It includes all loans and advances disbursed by the bank to its customers. Deyoung and Yom (2008) shows that interest rate, liquidity and credit risk can be managed through off-balance-sheet activities of non-interest income earning activities.

Non-interest Income and GDP: Macroeconomic factor is determined as real GDP growth rate and founds to be one of the explanatory variables. A strong macroeconomic environment could negatively affect foreign investment and financial innovation. Therefore, higher GDP growth rate is expected to have a positive effect on banks income earning of commercial banks in Ethiopia.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Research Approach

This chapter is the outline of how the thesis is carried out, data collected and what procedures are undertaken during the study. It also highlights the research methodology adopted and the rationale for its use including how the data collected and analyzed. Data collection procedure plays a critical role in a research and it is the source of most essential information for a study. In addition, the accuracy of the research is entirely based on the precision of the collected data.

3.2 Source of Data

Since the study is focus on secondary sources of data, the researcher collected all relevant data from National Bank of Ethiopia Addis Ababa office and Commercial Bank of Ethiopia Jimma district.

3.3 Data collection

To achieve the objective of this study, the researcher collected the needed quantitative Secondary source of data directly from annual report of National Bank of Ethiopia. The collected data were reorganized to make it ready for the intended study.

3.4 Data analysis

The collected data were analyzed using both descriptive and econometric methods of data analysis on bank specific characteristics, and macro-economic conditions for the period 2004 to 2017. Data have been rearranged and recalculated in order to make it complete data for this study. After that, the collected panel data is analyzed using descriptive statistics and multiple linear regression analysis of Ordinary Least Square (OLS) method. The descriptive statistics include mean, maximum and minimum values and standard deviation, which reflects the general trends of the data from 2004 to 2017. A multiple linear regression model is used to identify the relative importance of each explanatory variables in explaining the variation of non-interest income earning in Ethiopian commercial banks. Moreover, the regression analysis conducted by using STATA 13 statistical software packages.

3.5 Model specification

As per William et al. (2008), model development involves specifying relationships between two or more variables, and then extends the establishment of descriptive or predictive equations. The acceptance of the statistical method to be applied for regression analysis depends on different assumptions. These assumptions become the assumptions for the model and the data essentially. The quality of statistical inferences heavily depends on whether these assumptions are satisfied or not. For making these assumptions to be valid and to be satisfied, care is needed from the beginning of the experiment. A researcher has to be careful in choosing the required assumptions and to decide as well to determine if the assumptions are valid for the given experimental conditions or not? It is also important to decide which assumptions may not meet. Model specification is one tool to the determination of which independent variables should be included in or excluded from a regression equation. In general, the specification of a regression model should be based primarily on theoretical considerations rather than empirical or methodological ones.

Criteria for the model selection must incorporate goodness of fit and assumptions, allowing that several models examined can be simultaneously compared. Among the selection criteria most commonly adopted are the following: adjusted coefficient of determination, maximum likelihood test, and Schwarz information criterion (also called Bayesian). There are variations of the mathematical formulations of these criteria in the literature, thought their rationales are similar. In this study the researcher adopted the criteria of R^2 (coefficient of determination) which is perhaps the measure of fitting most widely used criteria in linear regression modeling.

Thus, in order to accomplish the objective of this study, the Ordinary least squares (OLS) multiple-regression model is used. Because ordinary least squares estimates the parameters in a regression model by minimizing the sum of the squared residual. This method draws a line that minimizes the sum of the squared differences between the observed values and the corresponding fitted values . Utilization of panel data involves a multi dimensional data that have frequently measurement over time and thus it is used in the researches' study to investigate the determinant of non-interest income. It has the following form;

$$\Pi_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad \text{.....} 1$$

X represent variables under study, i show the individual dimension and t is the time dimension. There are three approaches to analysis panel data that includes; independently pooled data, Fixed Effect Model (FEM) Model and Random Effect model (REM).The selection from these three methods depends on the objective of the researcher analysis and the problem of endogenouity of the explanatory variables. Also the assumption of error terms determines the selection of FEM or REM method.

Pooled model involves pool all observations together and run the regression model, neglecting the cross section and time serious nature of data. The major problem of this model is that it denies the heterogeneity or individuality that may exist among cross sectional observations or selected commercial banks.

$$\Pi_{it}=\alpha+\sum^{K}_{K=1}\beta_k X^{K}_{it}+\sum^{L}_{l=1}\beta_l X^{l}_{it}+\sum^{N}_{n=1}\beta_n X^{n}_{it}+\sum^{M}_{m=1}\beta_m X^{m}_{t}+\varepsilon_{it} \quad \ldots\ldots 2$$

Where: $\varepsilon_{it} \sim id\ (0,\delta^2)$

This means that individual observation are serially uncorrelated and the error term assumes the classical linear model hence pooled data can be estimated using ordinary least square (OLS)method.

Fixed Effect Model is suitable if the data exhausts the population Baltagi(1995).Because the study focus on specific set of six commercial banks and the inferences is restricted on those selected commercial banks. When we use FEM the intercept differ among individuals but each individual intercept does not vary over time. That is the intercept is time invariant. Also the slop regressions do not vary across individuals or over time. It can be represented as follows;

$$\Pi_{it}=\alpha+\sum^{K}_{K=1}\beta_k X^{K}_{it}+\sum^{L}_{l=1}\beta_l X^{l}_{it}+\sum^{N}_{n=1}\beta_n X^{n}_{it}+\sum^{M}_{m=1}\beta_m X^{m}_{t}+\varepsilon_{it} \quad \ldots\ldots 3$$

Here the symbol i has be introduced on the intersect term to suggest different banks have different intercept. The differences are due to special feature each bank such as management skill or strategy.

To test suitability of FEM the F-test statistic is used .The null hypothesis of the F-test statistic is that study units are homogenous and a pooled model is better and the alternative is that the stud units are heterogeneous and therefore they cannot be pooled. The null hypothesis is accepted

when the test statistic less than the critical value and the rejection of the null hypothesis lead to acceptance of the FEM.

We can expand equation (2) to drive REM by separating the unit specific residual in the error term where by the number of individual is larger and the number of time period is shorter. The error term component can be specified as;

$$\varepsilon_{it}=\Theta_i+\omega_{it} \quad \ldots\ldots 4$$

The individual specific effect Θ_i are random and distributed normally also they are constant across time may or may not be correlated with x^k_{it}. Further ω_{it} varies independently across time and individual. Assumptions that are made on individual effect determined whether FEM or REF is used. For REM Θ_i is uncorrelated with x^k_{it}, but for the FEM ω_{it} assumed to be correlated with x^k_{it}; therefore, equation (2) can represent as;

$$\Pi_{it}=\alpha+\sum^{K}_{K=1}\beta_k X^K_{it}+\sum^{L}_{l=1}\beta_l X^l_{it}+\sum^{N}_{n=1}\beta_n X^n_{it}+\sum^{M}_{m=1}\beta_m X^m_{t}+\Theta_i+\omega_{it} \quad \ldots\ldots 5$$

Or equation (5) can be represented as;

$$\overline{\Pi}_i=\alpha+\beta\bar{x}_k+\beta\bar{x}_i+\beta\bar{x}_n+\beta\bar{x}_m+\Theta_i+\bar{\omega}_{it} \quad \ldots\ldots 6$$

Where $\bar{\Pi}_i$, $\bar{x}_k$, $\bar{x}_i$, $\bar{x}_n$, $\bar{x}_m$ and $\bar{\omega}_{it}$ are the average variables estimated with respect to time. When we subtract equation (6) from (5) we can get equation 7

$$(\Pi_{it}-\overline{\Pi})_i=\beta(x_{it}-\bar{x})+(\omega_{it}-\bar{\omega}_i) \quad \ldots\ldots 7$$

Finally Housman test is utilized in this study to select whether FEM or REM is appropriate. Housman test null hypothesis is Random-Effect model is appropriate and the alternative hypothesis is Fixed-Effect model is appropriate. To select from the above two models, we have to see astatically significant p-value. If I get statistically significant p-value, I shall use Fixed-Effect model, otherwise Random-Effect model. If p-value is less than 5% I will reject null hypothesis and accept the alternative.

According to William et al. (2008) during model developing we are specifying relationship between two or more variables to establish descriptive or predictive equation. Thus this study adopts multiple regression model because of panel data involves pooling of observations on a cross section of units over several time period .Also it gives results that are simple in pure time

serious or pure cross sectional studies. On the bases of the above model and based on the selected variables, the following general multiple regression model is adopted by referring different studies conducted on the same area.

$$\Pi_{it}=\alpha+\sum^{K}_{K=1}\beta_k X^{K}_{it}+\sum^{N}_{n=1}\beta_n X^{n}_{it}+\sum^{M}_{m=1}\beta_m X^{m}_{it}+\varepsilon_{it} \quad \ldots\ldots 8$$

Where: $\mathbf{\Pi_{it}}$ is the non-interest income of bank **i** at time **t**, with **i=1,2,3,…,N,t=1,2,3,…,T;** $\boldsymbol{\alpha}$ is a constant in the regression equation, $\mathbf{X^{K}_{it}}$ will be a vector of bank **i's** specific variables **(k)** that include capital assets ratio (car), size (si) and loan assets ratio (lar) during period **t**; $\boldsymbol{\beta_n X^{n}_{it}}$ will be a vector of market conditions variables **(n)** of bank shown as loans to assets ratio (LAR) during period **t** . $\boldsymbol{\beta_m X^{m}_{it}}$ will be a vector of macro-economic variables **(m)** presented changes in economic growth (GDP) at period **t** and $\boldsymbol{\varepsilon_{it}}$ is the error term with being the unobservable bank specific effects across commercial banks which may vary due to differences in management and the individual error.

3.5.1 Measurement of variables

Dependent variable Non-interest income (NII): this is measured as the total non-interest income**.** Independent variables are; Bank specific characteristic size(SI): it is used to measure the total asset of banks; Capital-assets ratio (CAR): It is used to capture the impact of deregulation on the growth of non-interest income in commercial banks, and Macro-economic condition of Gross domestic product (GDP) growth.

Table 3.1 Expected sign of explanatory variables

Notation(symbol)	Variable name	Definition of variable	Expected sign
NII	Non-interest income	Non-interest income of banks	
BSI	Bank size	Measure the total asset of bank specific characteristic	+
CAR	Capital-asset ratio	Deregulation of banks	+
LAR	Loan-asset ration	Banks total loan to asset ratio	-
GDP	Gross Domestic Product	Change in Economic growth	+

Source: developed by the researcher (2020)

CHAPTER FOUR
RESULTS AND DISCUSSION

Introduction

The purpose of this chapter is to present finding and discussion on the results of the thesis. The first part presents the descriptive analysis on the variables of the study; the second part the result of fulfillment of classical linear regression model (CLRM) assumption and the last section present the result of regression analysis that includes the main finding of the study.

4.1 Descriptive statistics

The descriptive statistics presents dependent variable and independent variables of six commercial back in Ethiopia from the time period of 2004 to 2017.The study conducted descriptive statistics analyzed by STATA 13 software. Descriptive statistics is the first step to analysis average indicators of variables calculated from financial statements. Also the standard deviation reflects that how much deviation has been occurred from the average value?

The mean value of change (natural logarithm of NII) in non-interest income is 5.86 with standard deviation of 1.31 which indicate that on average commercial banks in Ethiopia have change of their non-interest income by birr 5.86 million with 1.31 million up and down from the period 2004 to 2017.The minimum and the maximum of non-interest income are 2.94 and 8.74 respectively. This reflects that minimum and maximum level of non-interest income from 2004 to 2017 were birr 2.94 million and 8.74 million respectively. Change in real GDP shows an average value of 6.12 with a variation of 0.51.This indicates that on average, change in real GDP growth of birr 6.12 billion within the study periods of 2004 to 2017 with up and down change of birr 0.51 billion. The minimum and maximum value for real GDP growth during the study periods were birr 5.39 billion and birr 7.36 billion respectively.

Natural logarithm of bank size has average value of 9.37 with standard deviation of 1.46.This shows that six commercial banks in Ethiopia have on average change in asset size by birr 9.37 million with variation of birr 1.46 million from the period 2004 to 2017. Also the minimum and maximum values were birr 6.51 and 13.10 million respectively.

One can understand from the above descriptive statistical table the change of average capital asset ratio was 2.37 with variation of 0.38 with in the fiscal years 2004 to 2017.This indicates that on average there were 2.37 % capital asset ratio change with 0.38% variation in CAR within

the study period 2004 to 2017 of six commercial banks in Ethiopia. Also the minimum of CAR was birr 1.39 million and maximum CAR values of birr 3.44 billion have been recorded with in the study period for those six banks. On the other hand natural logarithm of loan asset ratio has an average value of 3.88 with standard deviation of 0.21. And LAR has been shown a minimum birr 3.24 billion and a maximum of birr 4.26 billion performances were recorded with in the study period.

4.2 Correlation Analysis

In order to show the relationship between non-interest income of commercial banks in Ethiopia and bank size, capital asset ratio, loan asset ratio and real GDP growth correlation coefficient were used and analyzed. The value of correlation coefficients always between 1 and -1.A correlation coefficient of -1 indicates the two variables have a perfect negative relationship, where as a correlation coefficient of 0 shows that they have no linear relationship. If the correlation coefficient of two variables have +1 value it reflects that the two variables have perfect positive relationship with each other (Gujarati, 2014). According to Wajahat(2010) before conducting regression analysis it is use full to check correlation test between dependent and independent variable. But in correlation analysis, the primary objective is to measure the degree of linear association between all variables in the study. In addition to that there is no any distinction between dependent and independent variables in correlation analysis. This shows us correlation analysis does not allow the researcher to make cause and effect of inferences with respect to the relationship between the identified variables. As indicated on appendix 3B correlation coefficient a matrix indicates that GDP and SI are positively correlated with NII and CAR and LAR are negatively correlated with NII.

4.3 Choosing Random Effect or Fixed Effect model.

The study used panel data of six banks and four independent variables in order to analysis the determinants of non-interest income of commercial banks in Ethiopia. Thus the study should select one of effective model among FE or RE panel data analysis. Therefore there is need of choosing one model that give consistent estimates for the study to show cause and effect relationship of dependent and independent variables. The Hausman specification test or Lagrange Multiplier test for random effect method is applied as mentioned in the above chapter as Ho: RE model is appropriate against Ha: FE model is appropriate. From the regression result shown on appendix 3C, one can see that the probably value is greater than 5% level of

significances. Thus The Hausman specification test or Lagrange Multiplier test advice the researcher uses for random effect model of data analysis.

4.4 Diagnostic test of the classical linear regression model

Linear and unbiased estimators (BLUE) of the variables and to make valid inferences, the diagnostic testing of assumption of CLRM is required. The five basic assumptions should be fulfilled and these assumptions are; error terms have zero mean, constant variance of error terms (Homoskedascity), no autocorrelation, no multicolleneourity between explanatory variables and normality distribution assumptions are discussed below.

4.4.1 Zero mean and constant variance of error terms (Homoskedasticity) assumption $\varepsilon \sim (0, \delta^2)$

Any regression model with constant terms will never violate the assumption of zero mean value of error terms. Thus this study consists a constant terms and this assumption is not violated. The assumption of homoskedasticity is the condition residuals are approximately equal to all explained dependent variables score i.e. the variance of error terms are constant. In other word, classical linear regression model assumes that all observations are equally reliable and the error variance is constant. In the case when the error does not constant variance, it can be said that the assumption of homoskedasticity has been violated or the problem of heteroskedastcity exist.

Heteroskedastcity problem is systematic pattern in the stochastic variables variance is not constant. The hypothesis of heteroskedastcity is presented as follows;

Ho: There is no heteroskedastcity problem in the model

Ha: There is heteroskedastcity problem in the model

The presence of heteroskedastcity does not make the regression BLUE even if the estimators are still linear and unbiased. Furthermore, heteroskedastcity makes the regression estimates not efficient which means that there is some other linear estimator which has a lower variance. The existence of heteroskedastcity also results to incorrect standard error. This standard error leads to incorrect value of t-test and F-test which leads to wrong conclusion.

The whites test and Breusch-pagan is the most popular method to detect the presence of heteroskedastcity and the P-value should be higher than 0.05 to not reject the null hypothesis of homoskedasticity at 5% level of significance. In this study Breush-pagan test was used to detect the existence of heteroskedastcity. As shown in appendix 3D the result of test Breush-pagan test indicated that there is no evidence for existence of heteroskedastcity.

4.4.2 Normality assumption

Normality test is used to identify whether error term is normally distributed or not. According to Brooks (2008), the Jarque-bere statistics would be significant for disturbance term which is not normally distributed around the mean. The objective of Jarque-bere test to ensure that the data set is well modeled a normal distribution. The data is said to be normally distributed when the skeweness-kurtosis is approximately zero and three respectively. Here we can establish hypothesis as Ho: error term is normally distributed against Ha: error term is not normally distribute.

The result of Jarque-Bera test shows that skeweness-kurtosis test has a joint p-value of 0.4923 indicates that there were no evidence of the presence of normality problem in the data. Thus the researcher failed to reject null hypothesis that the data is normally distributed since p-value was greater than 0.05.

4.4.3 Multicolleneourity Assumption

The assumption of no multicolleneourity among independent variables reflects that there is no relationship between explanatory variables. Best regression models are those in which the predictor variables each correlate with the dependent variables but correlate minimally with each other Gujarati (2004).Hair et al (2006) has been suggested that the correlation coefficient below 0.9 may not cause serious multicolleneourity problem. Also Cooper and Schendlar (2009) suggested that the correlation above 0.8 should be corrected. In addition to that Malhotra (2007) argued that the problem of multicolleneourity exist where correlation coefficient among explanatory variables should be greater than 0.75.

The existence of multicolleneourity may result in large variance and standard error in the regression coefficient estimates and this result to low t-statistic and significance level. Furthermore the presence of multicolleneourity among independent variables result is misleading sign of the regression coefficient and significant F-test with insignificant individual coefficients. The existence of multicolleneourity between independent variable is detected by personal correlation or variance inflation factor (VIF).

In this study variance inflation factor is used to detect multicolleneourity. VIF measures how much the variance of an estimated regression coefficient increases if predictors are correlated. Accordingly when VIF greater than 10, the regression coefficients are poorly estimated and perfect multicolleneourity is likely. The result of VIF indicated on appendix 3E shown that all

variable below variance inflation factor less than ten. Thus the researcher can conclude that there is no perfect multicolleneourity between the explanatory variables.

4.5 Regression result and Discussions

The regression output of STATA 13 has been analyzed by Random Effect GLS regression model. Since CBE is large bank in terms of size, capital and asset share, the researcher wants to see the result of the study excluding CBE and it has been investigated that the estimator variable result of GDP has huge difference.

Therefore, random-effect model was used to show the relationship between the explained variable non-interest income and the explanatory variables bank size, real GDP, capital asset ratio and loan asset ratio of commercial banks in Ethiopia. According to Brooks (2008) R-squared value is used to measure how well the regression explains the actual variation in the explained variables. This stud result R-squared value is 0.953 this indicate that 95.5% variation on non-interest income of commercial banks in Ethiopia were explained by explanatory variables included in the model and the rest 4.5% of variation on non-interest income of commercial banks in Ethiopia are caused by other factors not included or considered in the model. Moreover, the profanity value 0.00 reflects that the overall model is adequate at 5% significant level and all independent are jointly significant by causing variation on non-interest income of commercial banks in Ethiopia.

From below indicated OLS regression result of random effect model, the researcher has been developed and presented the regression result as;

Lnnii=-1.25 +0.854si +0.202gdp + 0.085car – 0.599lar

Figure 4.1 random effect Regression result of STATA 13 out put

```
.xtreg lnnii lngdp lnsi lncar lnlar,re
Random-effects GLS regression                   Number of obs      =       84
Group variable: cid                             Number of groups   =        6
R-sq:  within = 0.9530                          Obs per group: min =       14
       Between = 0.9689                                        avg =     14.0
       Over all = 0.9554                                       max =       14
```

		Wald chi2 (4)	= 1582.33
Corr (u_i, X)	= 0 (assumed)	Prob > chi2	= 0.0000

lnnii	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lngdp	.2019747	.1069278	1.89	0.059	-.0076	.4115494
lnsi	.8536305	.0585426	14.58	0.000	.7388892	.9683718
lncar	.0854561	.1142329	0.75	0.454	-.1384363	.3093485
lnlar	-.599415	.152469	-3.93	0.000	-.8982489	-.3005812
_cons	-1.252185	.7937352	-1.58	0.115	-2.807877	.3035078
Sigma-u	0.180656					
sigma_e	0.210508					
rho	.42412715	(fraction of variance due to u_i)				

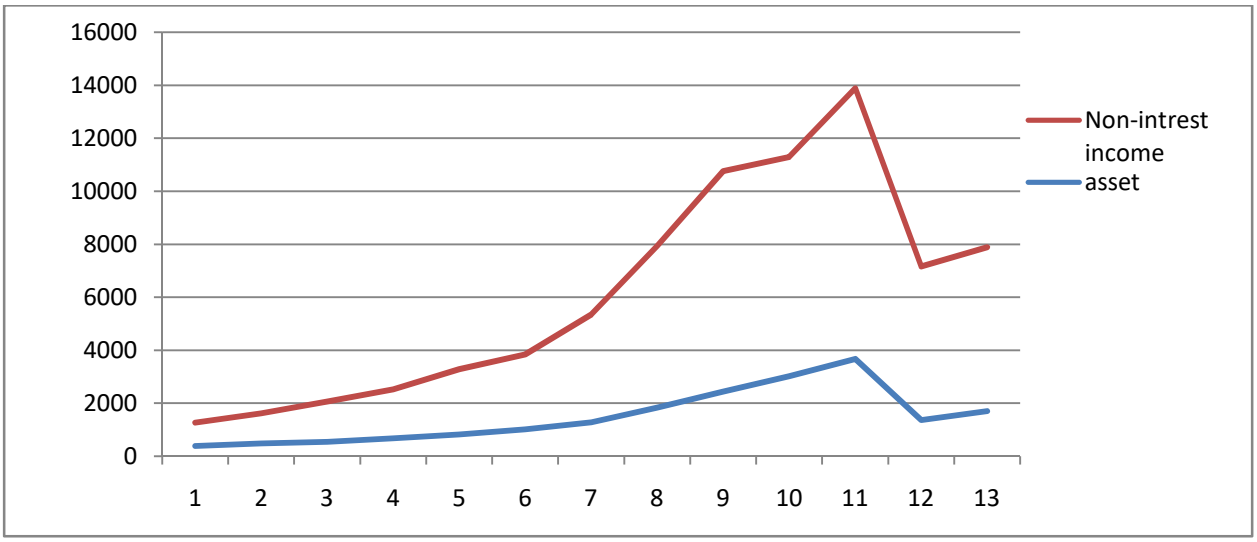
4.5.1 Bank size and non-interest income

The above regression output showed that size measured by natural logarithm of total asset size is 0.854 and its p-value is0 .000.This indicates that on average, holding other independent variables constant, a birr change in bank size will result in an increase of 0.854 birr of non-interest income earning of commercial banks in Ethiopia.

Thus, according to the study result the researcher rejected the null hypothesis of bank size and non-interest income has negative relationship. This shows that there is no sufficient evidence to support the negative effect of bank size non- interest income of commercial banks in Ethiopia. This finding is consistence with the alternative hypothesis as described in the previous chapters which indicate that large commercial banks in Ethiopia likely to increase non-interest income source more aggressively than small banks.

This empirical finding of this study, bank size is significant factor that affect non-interest income of commercial banks in Ethiopia. Justification for the positive effect of bank size on non-inertest income of commercial banks in Ethiopian is that large banks have large branch operation like CBE, greater accessibility and technological advancement. These help them to get high non-interest income than small sized banks. This positive relationship of non-interest income and bank size is graphically shown bellow.

Graph 4.1 relationship of banks asset and non-interest income from 2004 to 2016(13 years)



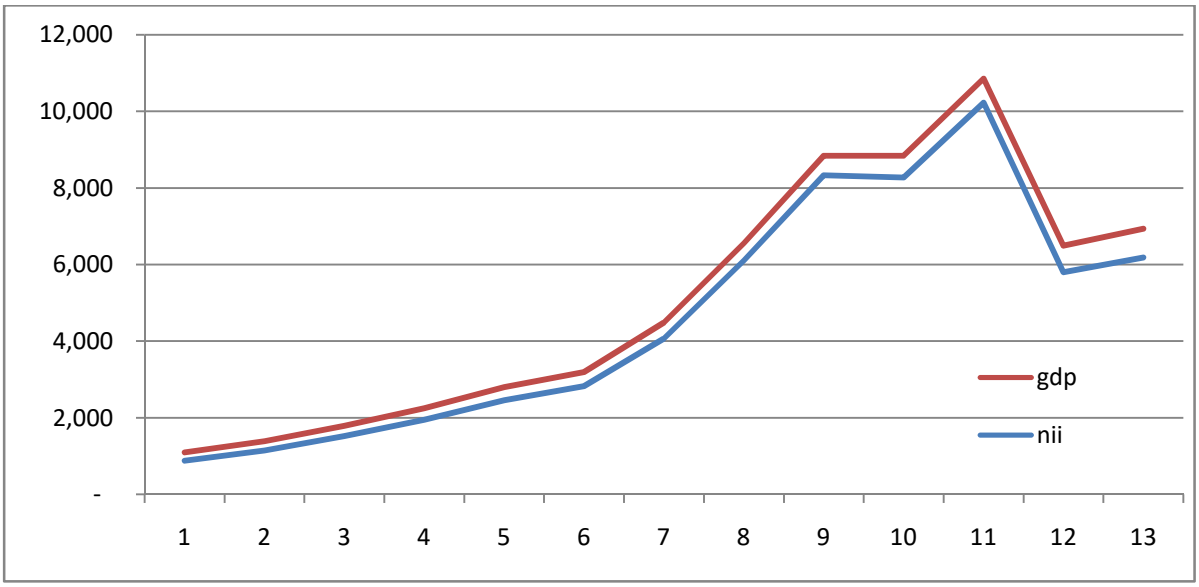
Source; researcher computation (2020)

4.5.2 Gross Domestic Product and non-interest income

From the above regression table 4.3 the coefficient of GDP is 0.2 a p-value of 0.059.This indicates that on average, when real GDP grow by one birr non-interest income also increase by 0.2 birr by keeping other explanatory variables constant and it is statistically significant at 95% of confidence level.

This finding rejects the null hypothesis that real GDP growth rate has a negative impact on non-interest income or inversely related to non-interest income. This means that there is no sufficient evidence to support the inverse relationship of real GDP growth on non-interest income. The study result also consistence with the alternative hypothesis developed in the previous chapter and various researches conducted in different countries is that high GDP growth a positive effect on non-interest income which is supported by De Yong and Rice (2004) and Xiangnan Meng, Tony Cavoli and Xin Deng (2018).This is because banks in countries with high GDP growing have an opportunity to expand income source toward non-interest income activities.

Graph 4.2 Relationship between real GDP non-interest incomes of commercial Banks in Ethiopia



Source: researcher computation (2020)

The above graph indicates that there is positive relationship between real GDP growth and non-interest income earning growth of commercial banks in Ethiopia.

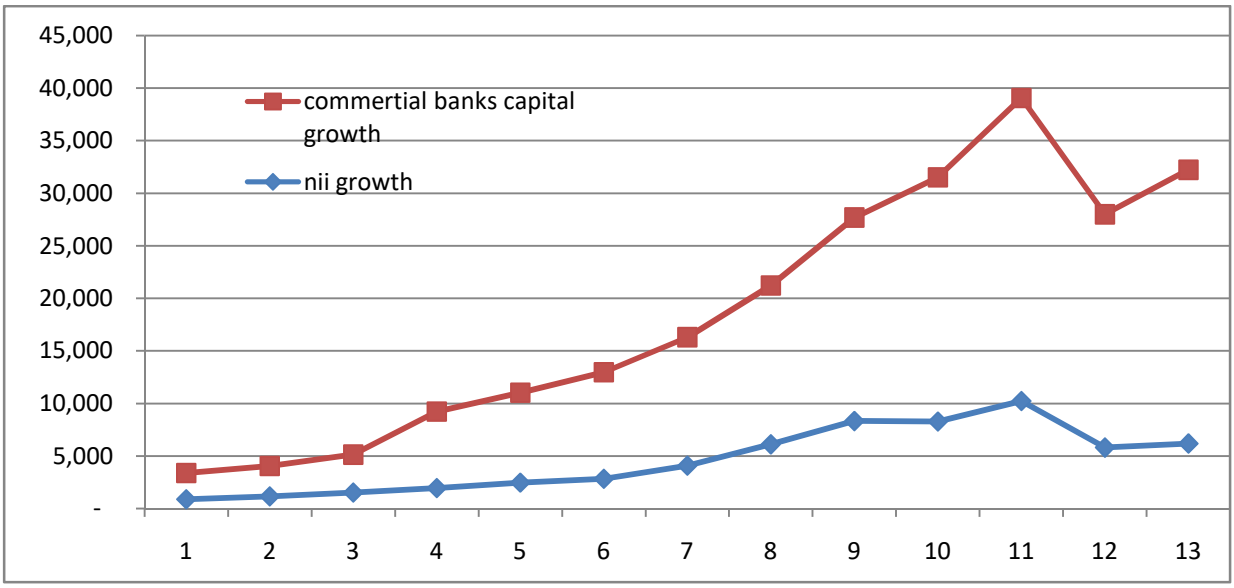
4.6.3 Banks capital and non-interest income

The regression result of banks capital measured by capital asset ratio has a coefficient of 0.09 with a p-value of 0.454. This reflects that on average when capital asset ratio of commercial banks in Ethiopia increase by one person, their non-interest income increase by .09% holding other independent variable remain constant and it is statistically insignificant at with p-value 0.454 which is greater than 10% significant level. However the result is statistically insignificant, graphical result and CBE capital share supported the researcher should not ignore the independent variable capital asset ration from the model.

Since various studies conducted on different countries postulated that the capital effect of commercial banks has indeterminate impact on non-interest income of commercial banks in various countries. But according to this study increasing capital of commercial banks has a positive relationship with non-interest income earning. The reason the positive effect of capital on capital on non-interest income earning in Ethiopia might be the fact that banks in Ethiopia use their capital to expand their business toward non conventional banking activities in order to

diversify the income source. Also the relationship of banks' capital and non-interest income is graphically presented below.

Graph 4.2 Relationship between capital and non-interest incomes of commercial Banks in Ethiopia



Source: researcher computation (2020)

4.6.4 Loan Asset ratio and non-interest income

The regression result shows that the coefficient of loan asset ratio is -0.6 with a P-value of 0.000. This reflects that on average commercial banks lending increase by one percent, non-interest income of commercial banks decrease by 0.6 million holding other explanatory variables unchanged. And the estimated value is statistically significant at 5% significant level

Therefore, the stud failed to reject the null hypothesis that loan asset ratio has a negative relationship with non-interest income. In other words it indicate that there is no sufficient evidence to support the positive effect of lending on non-interest income of commercial banks in Ethiopia .This result is inconsistence with alternative hypothesis is explained in the previous chapter which indicate that more flexible commercial banks in lending are less likely to diversify income source. This finding is not consistence with previous studies like (Cerasi and Dalthug 2000) and (De young and Yom 2008).The justification for the negative result could be the fact that commercial bands in Ethiopia with more lending capability earns more inertest income and they become reluctant to engage in non-interest income generating activities.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATION

The objective of this chapter is to describe the conclusion drawn from result of the study findings and then to give possible recommendation. It provides conclusion of the study and then forward relevant recommendation based on the finding of the research. Additionally this chapter provides for the other researcher suggested areas study for further analysis and investigation about the subject matter under study.

5.1 Summary and Conclusion

The main objective of the study was to analyze the main determinants of non-interest income earning strategy of commercial banks in Ethiopia .In doing so; quantitative research was used to conduct the study, secondary source of data obtained from National Bank of Ethiopia and annual report of commercial banks were used. Six commercial banks have been selected out of total population of seventeen commercial banks recently working in Ethiopia using purposive sampling based on duration in operational activity from 2004 to 2017 and availability of data. Empirical results indicate that non-interest income is associated with bank specific determinants and macro-economic variable of GDP.

Sanya and Wolf (2011) argue that increasing non-interest income can benefit emerging countries. A large part of literatures has examined the effect of non-interest income on bank risks and performances, but to argue the prior path on banking non conventional earning, a better understanding on the main determinants of commercial banks non-interest income earning are necessary. This research expected to improve our understanding on the impact of bank size, real GDP, capital asset ratio and loan asset ratio variables on non-interest income earning of commercial banks in Ethiopia. Also the study expected to provide insights for bank managers as well as policy makers and regulators to make decision on further banking sector development and maintaining of profitability on commercial banks.

Several empirical describe many variables as an influencing factor of non-interest income earning. Based on this background, this study examines the effect of those explanatory variables and their relative importance in determining non-interest income earning decision of Ethiopian commercial banks. Besides this four hypothesis were formulated to be tested under the study and the following variables change; bank size, real GDP, capital asset ratio and loan asset ratio were

regarded as explanatory variables and in change non-interest income was considered as dependent variable to measure non-interest income earning of commercial banks.

The study was conducted through using panel data estimation technique particularly random effect model were used to estimate the equation. Additionally, the study conducted misspecification or diagnostic test like multicolleneourity, heteroskedastcity and normality test to achieve the objective of the study by using STATA 13 statistical software. The result of diagnostic test shows that the data founded to be no heteroskedastcity, free of multicolleneourity and normally distributed. Based on the regression results on six selected commercial banks in Ethiopia data from the period 2004 to 2017, the researcher summarized the result of the finding in the following table;

Table.5.1 Summary of Findings

Independent variables	Coefficient estimate	Actual effect
Bank size	0.85 with p-value of 0.000	Positive and significant
GDP	0.29 with p-value of 0.059	Positive and significant
Capital asset ratio	0.09 with p-value of 0.454	Positive and insignificant
Loan asset ratio	0.6 with p-value of 0.000	Positive and significant

Source; researcher computation (2020)

Based on the main finding of the study, the researcher made conclusions on the main determinants of non-interest income earning of commercial banks in Ethiopia.

- Increasing bank size has direct relationship with non-interest income of commercial banks in Ethiopia.
- Real GDP growth has positive impact on non-interest income earning of commercial banks in Ethiopia.
- Increasing commercial banks' capital leads to generate more income from non-interest income sources.
- When commercial banks in Ethiopia focus on conventional activity of expanding loan, the income earning from non-interest income will be declined.

5.3 Recommendation

Banks with high non-interest income source are capable with the negative effect of relaying on single income sources in terms of risk and earning volatility. The model in study predicts non-interest income earning with its determinant factors. The finding of the study has provided insight into the independent variables that have an important in explaining the variation in non-interest income earning of commercial banks in Ethiopia.

Therefore, understanding the main determinants or factors affecting non-interest income earning decision banking sector has significance indication different stakeholders like policy makers, commercial banks regulators and banks management depending on their preference to get revenue other than the conventional interest income source. Based on the finding of this study, the researcher has forwarded the following recommendations;

- To make an informed decision on non-interest income earning maximization, bank board members and policy makers who are trying to predict the trends of commercial banks earning position might need to look the banks specific characteristics or factors in terms of increasing their banks size, capital and reduce their lending.
- Commercial banks should expand their non-interest income base to be benefited from the real GDP growth of Ethiopia's economy.
- Regulator of commercial banks in Ethiopia (National Bank of Ethiopia) should set conductive environment to promote non-interest income earning of commercial through increasing banks' total assets, capital and growth of real GDP of the country.
- Chief Executives', Directors' and Managers' of commercial banks in Ethiopia should consider their plan of banks size, capital, loan and the trends of real GDP growth rate during cascading there source of income. Considering these determinants will help them make their income earning decision efficiently, effectively and reasonably. In the long run it will help them to achieve their objective in maximization of owners and shareholders wealth and financial as well as employees need.

5.3 Future research direction

In future, researches shall be conducted on the determinant of non-conventional earning of commercial banks in Ethiopia by incorporating recent data of 2019/20 of bank specific characteristic and role of real GDP growth. Moreover, the relationship of non-interest income and interest free banking should be studied

REFERENCES

Ahmed, H.I. 2003, Trend in the profitability of banks in Nigeria before and during interest rate deregulation: A comparative analysis, NDIC Quarterly, 13, September.

Akhavein, J.D., Berger, A.N., Humphrey, D.B., 1997, the Effects of Mergers on Efficiency and Prices: Evidence from a Bank Profit Function. Finance and Economic Discussion Series 9, Board of Governors of the Federal Reserve System

Akinola, G.O 2008.Effect of globalization on market structure, conduct and performance in Nigerian banking, Department of Management and Accounting Journal.

Alexandru C, Genu G, Romanescu, M.L. 2008, The assessment of banking performances-indicators of performance in Bank Area. MPRA Paper No. 11600.

Amdemikael 2012, Factors affecting profitability: an empirical study on Ethiopian banking industry, MSc project paper, Addis Ababa University

Aremu, M. A., Mejabi 2013, Determinants of banks profitability in developing economy: 4(9)155-181

Aremu, M. A., Mejabi, O. V. and Gbadeyan, R. A. 2011, A Study on Customer's Perception of Information Technology in the Nigerian Banking Industry, 1 (4): 7 - 10.

Asian Development Bank hand book and manual, (2006), Financial Management and Analysis of Projects.

Athanasoglou P.P Sophocles N.B, Matthaios, D.D. 2005, Bank-specific, industry-specific &macroeconomic determinants of bank profitability .Working paper, Bank of Greece. pp 3-4

Belayneh (2011), Determinants of commercial banks profitability: an empirical review of Ethiopian commercial banks, MSc project paper, Addis Ababa University

Ben-Naceur, SB &Omran, M 2011, the effects of bank regulations, competition, and financial

Birhanu 2012, "Determinants of commercial banks profitability:" empirical evidence from the commercial banks of Ethiopia, MSc project paper, Addis Ababa University

Bobakova, I.V.2003, Raising the Profitability of Commercial Banks. Journal of International Finance, Volume XI, 21-25.

Brooks, C. (2008). Introductory Economics for Finance (2nd ed). New York: Cambridge University press.

Cerasi, V, and S.Daltung.2000, "The Optimal size of a Bank: costs and benefits of Diversification." European Economic review 44:1701-1726

Clark, J, A., and T.F., Siems.2002. "X-Efficiency in Banking: Looking beyond the Balance Sheet." Journal of Money, Credit & Banking 34: 987-1013.

Creswell J. W 2009, Research design: Qualitative and quantitative approaches, 3rd ed, Sage Publications, London UK.

Damena, 2011, Determinants of commercial banks profitability: an empirical study on Ethiopian commercial banks, MSc project paper, Addis Ababa University

DeYong, R and Rice, 2004, "None interest Income and Financial Performance of U.S Commercial Banks." Financial Review 39:101-127

DeYong, R., Roland, K., 2001. Product mix and earnings volatility at commercial banks Evidence from U.S Commercial Banks, 1990-2005." Journal of Financial Stability 4: 275-303: 275-303

DeYong, R, and Yom; 2008, "On the Independency of Asset and Liability: Evidence from U.S Commercial Banks, 1990-2005." Journal of Financial Stability 4: 275-303

Evans. O 2014, Effects of macroeconomic factors on commercial banks profitability in Kenya: Case of Equity bank limited.

Flamini, V., McDonald, C. and Schumacher, L. (2009), The Determinants of Commercial bank Profitability in Sub-Saharan Africa. IMF working paper, (09/15).

Fireston, W.A. 1987, Source- www.anderson.edu/acadamics/sot/guide/ch1.htmlPage 17 Greener Sue, 2008, Business research method, ventures publication ApS, Swedish institute.

Fotios Pasiouras and Kyriaki Kosmidou (2007), Factors influencing the profitability of domestic and foreign commercial banks in the European Union, Research in International Business and Finance pp. 222–237

Guru B.K Staunton J.and Balashanmugam B.1999,determinants of Commercial Bank Profitability in Malaysia, Sydney, Australia, 16-17 December.

Habtamu 2012, Determinants of bank profitability: an empirical study on Ethiopian private commercial banks, MSc project paper, Addis Ababa University.

Joon-Ho Hahm (2008): "Determinants and Consequences of Non-Interest Income Diversification of commercial banks in OECD Countries", Journal of International Economics Studies Vol.12, No.1, June 2008.

Guajarati, D.N.(2004).Basic Econometrics (Vol. 4th edition). MacGraw-hill companies

Molyneux, P. and Thornton, J. 1992, Determinants of European Bank Profitability: A Note. Journal of Banking and Finance, 16: 1173-1178.

Naceur S. B. 2003, Determinants of the Tunisian Banking Industry Profitability: Panel Evidence. Frontiers in Finance and Economics, 5(1): 106-130.

Landi, A., V. Venturelli, and V. Berengario (2001), The Diversification Strategy of European Banks: Determinants and Effects on Efficiency and Profitability In EFMA .

Ogunleye, R.W 1995, Monetary Policy Influence on Banks Profitability. NDIC Quarterly, 5 (4), Rumler, F &Waschiczek, W 2010, The impact of economic factors on bank profits", Monetary Policy & the Economy, vol. 4, pp 49-67.

Ongore, Vincent Okoth & Kusa, Gemechu Berhanu (2013), „Determinants of Financial Performance of Commercial Banks in Kenya", International Journal of Economics and Financial Issues, vol. 3, no. 1, pp.237-252

Sabo, B. 2007, An Assessment of the Determinants of the Nigerian Banking Industry Profitability: Using Panel Evidence from Nigerian Commercial Bank, The information manager Vol. 7 (2) 2007.

Sanya' S., and S.2011. "Can Banks in Emerging Economies benefit from Revenue Diversification?" Journal of Financial Services Research 40: 79-101.

Saunders. A & Cornett, M. M. 2008, Financial Institutions Management: A Risk Management Approach. New York: McGraw-Hill.

Tesfaye, Z. (2018). Determinants of non-Interest income of Ethiopian Commercial Banks: the case of private commercial banks" research paper, St.Mary's University, Ethiopia

Tigist A, 2013, "determinants commercial banks of off balance sheet activities an empirical on Ethiopian banking industry" research paper, Addis Ababa University, Ethiopia

Trujillo-Ponce A 2012, what determines the profitability of banks? Evidence from Spain, working paper: Pablo de Olavide University.

William, B.And G.Rajaguru. 2007. "The Chicken or the Egg? The Trade-Off between bank Non-interest Income and Net Interest Margin" paper presented at 20th Australasian Finance and Banking Conference Sydney. December 12-14.

Appendix:

Appendix 1: List of commercial banks in Ethiopia

No.	Bank Name	Year of Establishment
1	Commercial Bank of Ethiopia	1943
2	Awash International Bank	1994
3	Dashen Bank	1995
4	Bank of Abssiniya	1996
5	Wegagen Bank	1997
6	United Bank	1998
7	Nib International Bank	1999
8	Cooperative Bank of Ethiopia	2004
9	Lion International Bank	2006
10	Zemen Bank	2008
11	Oromia International Bank	2008
12	Buna International Bank	2009
13	Berhan Bank Share Company	2009
14	Abay Bank share company	2010
15	Addis International Bank Share Company	2011
16	Debub Global Bank Share Company	2012
17	Enat Bank Share Company	2012

Source: National Bank of Ethiopia

Appendix: 2 List of variables with their numerical values

nii	gdp	si	car	lar	lnnii	lnsi	lngdp	lncar	lnlar	Bank name	year

740	248	47254	4	30.77	6.60665	10.76329	5.513429	1.386294	3.42654	CBE	2005
971	277	54089	4	25.53	6.878326	10.89839	5.624018	1.386294	3.239854	CBE	2006
5987	747	369052	4.01	37.34	8.697346	12.81869	6.616065	1.388791	3.620065	CBE	2016
5199	626	366707	4.46	44.93	8.556222	12.81232	6.439351	1.495149	3.805106	CBE	2014
6263	692	290603	4.51	38.29	8.742414	12.57971	6.539586	1.506297	3.645189	CBE	2015
4426	568	301796	4.59	48.35	8.395251	12.61751	6.342122	1.52388	3.878466	CBE	2013
588	220	38125	5	31.57	6.376727	10.54863	5.393628	1.609438	3.452207	CBE	2004
2913	475	182757	5.48	49.42	7.976939	12.11591	6.163315	1.701105	3.900355	CBE	2011
4870	517	243495	5.59	46.21	8.490849	12.40285	6.248043	1.720979	3.833196	CBE	2012
75	220	2677	6.23	63.13	4.317488	7.892452	5.393628	1.829376	4.145196	Dashen Bank	2004
72	248	3420	7.11	65.26	4.276666	8.137396	5.513429	1.961502	4.17838	Dashen Bank	2005
1751	418	127701	7.49	49.16	7.467942	11.75744	6.035481	2.013569	3.89508	CBE	2010
1490	378	100971	8.48	38.31	7.306531	11.52259	5.934894	2.13771	3.645711	CBE	2009
125	277	4546	8.49	69.6	4.828314	8.422003	5.624018	2.138889	4.242764	Dashen Bank	2006
56	220	1770	8.76	53.45	4.025352	7.478735	5.393628	2.170196	3.978747	Awash Bank	2004
1431	344	82004.2	9	33.22	7.266129	11.31453	5.840641	2.197225	3.503152	CBE	2008
165	309	6041	9.01	66.02	5.105946	8.706325	5.733341	2.198335	4.189958	Dashen Bank	2007
246	475	7277.96	9.08	45.56	5.505332	8.892606	6.163315	2.206074	3.81903	Abyssinia	2011
482	418	12353.4	9.09	40.87	6.177944	9.421685	6.035481	2.207175	3.710396	Dashen Bank	2010
207	418	6280	9.32	50.21	5.332719	8.745125	6.035481	2.232163	3.916214	Abyssinia	2010
250	344	7829	9.33	55.92	5.521461	8.96559	5.840641	2.233235	4.023922	Dashen Bank	2008
321	378	9733	9.34	45.74	5.771441	9.183277	5.934894	2.234306	3.822973	Dashen Bank	2009
129	378	2477	9.48	49.46	4.859812	7.814804	5.934894	2.249184	3.901164	Abyssinia	2009
679	475	14659.8	9.53	42.41	6.520621	9.592864	6.163315	2.254445	3.747384	Dashen Bank	2011
95	344	4270	9.83	65.98	4.553877	8.359369	5.840641	2.285439	4.189352	Abyssinia	2008
1217	309	67572	10	34.13	7.104144	11.12095	5.733341	2.302585	3.530177	CBE	2007
6263	1577	490068	10	33.73	8.742414	13.1023	7.36328	2.302585	3.518388	CBE	2017
55	248	2226	10.24	57.95	4.007333	7.707962	5.513429	2.326302	4.059581	Awash Bank	2005
91	277	2954	10.29	63.37	4.510859	7.990915	5.624018	2.331172	4.148991	Awash Bank	2006
796	568	19747.2	10.36	44.8	6.679599	9.890765	6.342122	2.337952	3.802208	Dashen Bank	2013
827	517	17520	10.43	46.37	6.717805	9.7711	6.248043	2.344686	3.836653	Dashen Bank	2012

226	568	10129.4	10.93	46.42	5.420535	9.223194	6.342122	2.391511	3.83773	Abyssinia	2013
135	378	4652	11	46.27	4.905275	8.445052	5.934894	2.397895	3.834494	United	2009
260	418	5896	11	44.33	5.560682	8.68203	6.035481	2.397895	3.791662	United	2010
226	517	8240	11	47.3	5.420535	9.016756	6.248043	2.397895	3.85651	Abyssinia	2012
462	1577	21903	11	54.77	6.135565	9.994379	7.36328	2.397895	4.003143	United	2017
1176	1577	41975	11.11	53.79	7.069874	10.64483	7.36328	2.407845	3.985088	Awash Bank	2017
70	248	1616	11.14	62	4.248495	7.387709	5.513429	2.410542	4.127134	Wegagen	2005
100	277	2259	11.29	70.52	4.60517	7.722678	5.624018	2.423917	4.255896	Wegagen	2006
129	309	3830	11.32	65.59	4.859812	8.25062	5.733341	2.426571	4.183423	Awash Bank	2007
789	1577	25324.8	11.47	54.99	6.670766	10.13954	7.36328	2.439735	4.007152	Abyssinia	2017
1344	1577	34624.6	11.53	52.23	7.203405	10.45232	7.36328	2.444952	3.955657	Dashen Bank	2017
135	309	3480	11.59	61.93	4.905275	8.154788	5.733341	2.450143	4.126005	Wegagen	2007
201	378	6423	11.68	42.24	5.303305	8.76764	5.934894	2.457878	3.743368	Awash Bank	2009
1211	747	28576.4	11.75	44.43	7.099202	10.26034	6.616065	2.463853	3.793915	Dashen Bank	2016
1102	692	24763.9	11.81	46.55	7.004882	10.11714	6.539586	2.468947	3.840527	Dashen Bank	2015
1004	626	21962.2	11.83	42.94	6.911747	9.997078	6.439351	2.470639	3.759804	Dashen Bank	2014
348	418	7945	11.84	39.59	5.852202	8.980298	6.035481	2.471484	3.678576	Awash Bank	2010
65	309	3396	11.87	67.87	4.174387	8.130354	5.733341	2.474014	4.217594	Abyssinia	2007
45	248	1073	12	55.27	3.806663	6.978214	5.513429	2.484907	4.01223	United	2005
55	277	1599	12	62.79	4.007333	7.377134	5.624018	2.484907	4.139796	United	2006
292	475	7726	12	42.42	5.676754	8.952347	6.163315	2.484907	3.74762	United	2011
305	568	9978	12	47.71	5.720312	9.208138	6.342122	2.484907	3.865141	United	2013
386	692	14361	12	47.77	5.955837	9.572271	6.539586	2.484907	3.866398	United	2015
448	747	17270	12	49.42	6.104793	9.756726	6.616065	2.484907	3.900355	United	2016
26	220	1585	12.18	60.69	3.258096	7.36834	5.393628	2.499795	4.105779	Abyssinia	2004
47	248	2057	12.35	59.99	3.850147	7.629004	5.513429	2.513656	4.094178	Abyssinia	2005
172	344	4220	12.39	56.8	5.147494	8.34759	5.840641	2.51689	4.039536	Awash Bank	2008
832	626	20028.8	12.61	45.82	6.723833	9.904926	6.439351	2.53449	3.824721	Awash Bank	2014
535	747	16828.1	12.62	47.61	6.282267	9.730803	6.616065	2.535283	3.863043	Abyssinia	2016
901	747	29610	12.89	52.18	6.803505	10.29587	6.616065	2.556452	3.954699	Awash Bank	2016
533	475	10115.8	12.93	39.41	6.278522	9.221852	6.163315	2.55955	3.67402	Awash Bank	2011

839	692	23869.6	12.95	52.29	6.732211	10.08036	6.539586	2.561096	3.956805	Awash Bank	2015
313	517	8787	13	46.49	5.746203	9.081029	6.248043	2.564949	3.839237	United	2012
244	626	11878	13	42.69	5.497168	9.382443	6.439351	2.564949	3.753965	United	2014
354	692	13667.5	13.25	43.21	5.869297	9.522779	6.539586	2.583997	3.766072	Abyssinia	2015
442	517	11936.7	13.49	46.12	6.09131	9.387371	6.248043	2.601949	3.831247	Awash Bank	2012
598	568	14858.8	13.54	51.89	6.393591	9.606349	6.342122	2.605648	3.949126	Awash Bank	2013
451	626	11276.4	13.56	44.88	6.111467	9.330466	6.439351	2.607124	3.803992	Abyssinia	2014
19	220	674	14	56.97	2.944439	6.51323	5.393628	2.639057	4.042525	United	2004
109	344	3250	14	57.22	4.691348	8.086411	5.840641	2.639057	4.046904	United	2008
55	277	2834	14.18	69.27	4.007333	7.949444	5.624018	2.651833	4.238012	Abyssinia	2006
192	344	4125	14.68	56.89	5.257495	8.324821	5.840641	2.686486	4.04112	Wegagen	2008
70	309	2183	16	64.6	4.248495	7.688456	5.733341	2.772589	4.168214	United	2007
798	1577	20949	16.02	48.86	6.682108	9.949846	7.36328	2.773838	3.888959	Wegagen	2017
239	378	5118	16.34	41.27	5.476463	8.540519	5.934894	2.793616	3.720136	Wegagen	2009
500	475	8061	16.59	36.1	6.214608	8.994793	6.163315	2.8088	3.586293	Wegagen	2011
409	626	11243	17.07	40.96	6.013715	9.327501	6.439351	2.837322	3.712596	Wegagen	2014
509	747	16189	17.33	46.37	6.232448	9.692087	6.616065	2.852439	3.836653	Wegagen	2016
366	568	10394	17.61	45.12	5.902633	9.248984	6.342122	2.868467	3.809326	Wegagen	2013
473	692	13711	17.61	44.28	6.159095	9.525953	6.539586	2.868467	3.790533	Wegagen	2015
318	418	5742	18.32	43.08	5.762052	8.655562	6.035481	2.907993	3.763059	Wegagen	2010
408	517	8347	19.22	42.72	6.011267	9.029657	6.248043	2.955951	3.754667	Wegagen	2012
44	220	1140	31.32	64.74	3.78419	7.038784	5.393628	3.444257	4.170379	Wegagen	2004

Source: National Bank of Ethiopia

Appendix 3: STATA 13 regression outputs

Appendix 3A: Result of Normality test: Jarque-Bera test

```
. sktest uhat

                    Skewness/Kurtosis tests for Normality
                                                       ------- joint ------
    Variable |   Obs   Pr(Skewness)   Pr(Kurtosis)  adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------
        uhat |    84      0.1784         0.4923         2.35         0.3081

.
```

Appendix 3B: Descriptive Statistics

```
. summarize lnnii lngdp lnsi lncar lnlar

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       lnnii |        84    5.858524    1.312177   2.944439   8.742414
       lngdp |        84    6.127657    .5063796   5.393628    7.36328
        lnsi |        84    9.369225     1.46362    6.51323    13.1023
       lncar |        84    2.371683    .3795163   1.386294   3.444257
       lnlar |        84    3.882874    .2070426   3.239854   4.255896

.
```

Appendix 3C: Correlation analysis of variance

```
. corr lnnii lngdp lnsi lncar lnlar
(obs=84)

             |    lnnii    lngdp     lnsi    lncar    lnlar
-------------+---------------------------------------------
       lnnii |   1.0000
       lngdp |   0.6483   1.0000
        lnsi |   0.9684   0.5700   1.0000
       lncar |  -0.4397   0.1123  -0.5549   1.0000
       lnlar |  -0.6402  -0.2629  -0.6118   0.2940   1.0000
```

Appendix 3D: Result of model specification test: Houseman specification test

```
. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference          S.E.
-------------+----------------------------------------------------------------
       lngdp |  -.0190685     .2019747       -.2210433        .0815695
        lnsi |   .9927448     .8536305        .1391143        .0518111
       lncar |   .0063549     .0854561       -.0791012        .0008997
       lnlar |  -.5855624     -.599415        .0138526               .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        7.15
                Prob>chi2 =      0.1282
                (V_b-V_B is not positive definite)
```

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        lnnii[cid,t] = Xb + u[cid] + e[cid,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                   lnnii |   1.72181       1.312177
                       e |  .0443137       .2105081
                       u |  .0326368       .1806565

        Test:   Var(u) = 0
                             chibar2(01) =    48.45
                          Prob > chibar2 =   0.0000
```


```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        lnnii[cid,t] = Xb + u[cid] + e[cid,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                   lnnii |   1.72181       1.312177
                       e |  .0443137       .2105081
                       u |  .0326368       .1806565

        Test:   Var(u) = 0
                             chibar2(01) =    48.45
                          Prob > chibar2 =   0.0000
```

Appendix 3E: Result of Heteroskedastcity test

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnnii

         chi2(1)      =     0.00
         Prob > chi2  =   0.9475
```

Appendix 3F: result of Multicolleneourity test using VIF

```
. estat vif
```

Variable	VIF	1/VIF
lnsi	4.86	0.205683
lngdp	2.57	0.388736
lncar	2.48	0.403648
lnlar	1.69	0.590941
Mean VIF	2.90	