



**ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE**

**DETERMINANTS OF COMMERCIAL BANKS PROFITABILITY, AN
EMPIRICAL STUDY ON PRIVATE COMMERCIAL BANKS IN ETHIOPIA**

**BY
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**April, 2021
Addis Ababa**

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**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF
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FINANCE**

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ADDIS ABABA**

Statement of Declaration

I, the undersigned, hereby declared that this thesis entitled “Determinants of Commercial Banks Profitability, An Empirical study on Private Commercial Banks in Ethiopia” is my original work and it has never been presented for the award of any other Degree, Diploma, Fellowship or other similar titles of any other university or institution. All sources and materials used for this thesis have been duly acknowledged.

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This is to certify that the thesis prepared by Tesfahun Demle, entitled: **Determinants of Commercial Banks Profitability, An Empirical study on Private Commercial Banks in Ethiopia** and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

The main objective of this study is to determine the factors that affect the private commercial banks' profitability in Ethiopia. Based on this general objective, three dependent and nine bank specific and macroeconomic independent variables have been analyzed. In the literature, banks profitability, typically measured by return on asset and return on equity. But, as these two methods not showing the consistency of risk appetite with business structure and strategy of a bank, the researcher considered a new variable of return on risk weighted asset. Hence, the bank profitability is measured by ROA, ROE & RORWA as a function of bank specific and macroeconomic determinants. All private commercial banks operating in the country are considered. Balanced Panel data of 16 commercial banks from 2014 to 2019 was used. Both descriptive and random effect panel econometrics method of data analysis have been employed and the collected data analyzed through Eviews 9 software. Cost of operating income, net interest margin, non-interest income, liquidity, and capital adequacy ratio were found to have significant effect on banks profitability as measured by ROA, ROE and RORWA. Bank size significantly determine profitability measured by AROE and RORWA, whereas, inflation significantly influences profitability measured AROA. Whereas, non-performing loan, bank size and RGDP with AROA; and non-performing loan, Inflation and RGDP with AROE and RORWA, were statistically insignificant effect. The results show that banks' profitability is highly correlated with the banks' ability to manage their operating cost and interest margin, diversify their income sources, and strict follow-up on their liquidity and capital adequacy positions. The study indicates that most of the considered independent variables behave similarly with the risk-neutral and risk adjusted performance measurements, except capital adequacy ratio.

Keywords: Profitability, Determinant, Private Commercial Banks, Ethiopia

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List of Acronyms

AIB: -Awash International Bank

DB: - Dashen Bank

BOA: - Bank of Abyssinia

WB: - Wegagen Bank

UB: - United Bank

NIB: - Nib International Bank

CBO: - Cooperative Bank of Oromia

LIB: - Lion International Bank

ZB: - Zemen Bank

OIB: - Oromia International Bank

BIB: - Bunna International Bank

BiB: - Birehan International Bank

AB: - Abay Bank

ADIB: - Addis International Bank

DGB: - Debub Global Bank

EB: - Enat Bank

GDP: - Gross Domestic Products

NBE: - National Bank of Ethiopia

NPL: - Non Performing loan

ROA: - Return on Asset

ROE: - Return on Equity

NIM: - Net Interest Margin

RORWA: - Return on Risk Weighted Assets

OLS: - Ordinary Least Square

CLRM: - Classical Linear Regression Model

VIF: - Variance Inflation Factor

CHAPTER ONE

Introduction

1.1 Background of the study

Inter-mediating and ensuring adequate resource utilizations are the major role of the banking industry for the stability of the country's economy. Consequently, mobilizing resources from surplus and financing the deficit is the primary goal of financial institutions with the aim of increasing profitability, as their purpose is to optimize the shareholders return. According to the European Central Bank (2010), profitability is the first line of protection against unexpected losses, strengthen capital position, maintains ongoing operations, offers fair returns to investors, as well as improving future profitability through the investment of retained earnings.

Elshaday et al. (2018) noted that the economy of developing countries is highly dependent on well-functioning of their commercial banks. As a result, banking industry is the most heavily regulated financial institutions in the globe. In order to mitigate various risks associated with the activities of commercial banks in Ethiopia, the regulatory body (NBE) has issued various directives to regulate the activities of financial institutions, like liquidity requirement, legal reserve, capital adequacy, initial capital requirement, and others. On the study of Abdissa (2016) stated that the reason behind imposing of regulations on the banking industry is that their healthy operation is critical for the overall economic stability and their failure has a huge negative signaling impact to the economy.

Until recent time, the Ethiopian banking industry has been highly dependent on traditional operational activities. The service was mainly focuses on mobilizing financial resources from the public in the form of saving and providing loans to generate interest income. The other operational activities include issuing guarantee, letters of credit, Cash against documents, local fund transfers, and other related services, which are the sources of service charge and commission income. Recently, however, digital banking services, POS, Internet Banking, Mobile Banking, ATMs, and others, are become familiar in the industry. Boru, (a2014) noted that bank's ability to create fee based services doesn't appear momentous as compared to the intermediation business.

The Ethiopian financial industry has been dominated by banking, microfinance and insurance activities. According to NBE annual report (2018/19), Ethiopia's commercial banking sector consists of 17 commercial banks (16 private and 1 public banks); which is a good move from the mono state-owned bank in 1990 and 7 banks early 2000. Since 1991, the directive issued for a minimum capital requirement to establish a bank has been revised periodically. The minimum capital requirement first revised from birr 75 million to birr 100 million, then again on 19/9/11 from birr 100 million to birr 500 million. But, after that, i.e., for almost a decade, no new entrant bank has been exhibited. The number of microfinance and insurance companies has reached 38 and 17, respectively.

The researcher analyzed from the NBE 2018/19 annual report that the total deposit balance of the banking sector in Ethiopia reached Birr 899 billion, (which is closed to 30% of the country's GDP); total loan book balance of Birr 556.6 billion (around 18% of the GDP); net profit of Birr 23 billion (0.7 % of the GDP); contributes around Birr 10 billion in the form of profit tax; employed more than 100,000 employees, and others.

In the study of Filamini (2009), the average Return on Assets of Ethiopian commercial banks was three percent and found to be higher than the Sub-Saharan Africa (SSA). Ethiopia's Private banking sector, almost without interruption, has been enjoyed a steady loan, deposit and profit growth for longer periods. As computed by the researcher from the NBE reports, deposit growth over the past ten years has an average annual rate of 28 percent, 32 percent for loan and advances, and 26 percent for profits. The growth has been registered even in the years wherein the country has been in serious economic, political, and social instabilities. This implies that there is an untouched market in the country's economy. Hence, financial performance analysis of Ethiopian commercial banks has been of great interest to academic research, and this study sought to identify the major factors that determine the bank's profitability and thereby to give a direction on the areas that require the banks' management attention.

1.2 Statement of the Problem

The banks financial performance is measured against its ability to mobilize public financial resources, invest the resources into revenue-generating services, maximize profits from such offerings through effective measures of income and expense, and maintain effective capital management in order to provide shareholders with adequate returns. In response to economic and

financial sector reforms, Prajapati & Kumar, (2019) noted that banks are transcending their normal business operation and diversifying their activities.

Extensive empirical studies were conducted by various researchers around the globe. Researchers like Fadzman & Muzafar (2010); Tamiru, (2013); Artor Nuhui et al. (2017); Chinoda, (2014); Boru, (2014); Marshal, (2013); Moges, (2017); Nadeem et al. (2013), Sanni et al. (2020), Ahmad el al., (2016); Elshaday (2018) and others have carried out studies on the factors that determine profitability of commercial banks. These studies were performed by examining a set of bank specific variables and macroeconomic factors.

Return on Asset (ROA) and Return on Equity (ROE) used as profitability measurement for most of the researches carried out in Ethiopia. While, according to Islam et al; (2017), ROA reflects the ability of a bank's management to generate profits from the bank's assets, although it misleads due to off-balance-sheet activities. Off-balance sheet activities include items such as loan commitments, letter of credits, cash against document, issued guarantee and others. The use of off-balance sheet activities may increase the reported income, as it includes the service charges generated from the off balance sheet activities, while the balance of total assets included in the denominator remains unchanged. As a result, according to Davydenko (2010), ROA creates a positive bias in evaluating the bank performance. On the other hand, Flamini et al; (2009), noted that an analysis of ROE disregards financial leverage and the risks associated with it. Hence, the banks with lower level capital might register higher ratio as compared to others that have higher capital. As a result, Davydenko (2010) noted that the bank with high level of financial leverage is highly correlated with high degree of risk. Moreover, Tewodros and Gedion (2019), mentioned that banks with lower leverage will generally report higher ROA, but lower ROE. A bank ROE is affected by its ROA as well as by the bank's degree of financial leverage, as ROE is the result of profit margin (PM), asset utilization (AU) and financial leverage (FL). The effect of profit margin and asset utilization gives ROA.

The European Central Bank (2010) stated that the most frequently used variables that are considered as traditional methods are Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM). These methods were not considered to illustrate the consistency of risk appetite with the banks business structure and strategy. Similarly, Klaassen & Van (2015) noted that the risk is totally ignored by the widely used performance indicators to assess bank

performance. In addition to the risk neutral factors, considering a risk-adjusted measure of bank performance could enable investors, depositors and stakeholders to have a real picture about their economic decision. Ahmad et al., (2016) stated that when they are risk adjusted, the traditional performance metrics become more stable and act as bank stability measures. Moreover, Goyal et al., (2016), mentioned that financial institutions must weigh complex trade-offs between growth, return and risk in order to be effective in their operations, favoring the adoption of risk-adjusted metrics.

On the other hand, most of the researches carried out in Ethiopia like, Boru (2014); Tamiru (2013); Moges (2017); Elshaday (2018); Abdissa (2016) and Tewodros and Gedion (2019) were used a sample technique that concentrated predominantly on long-stayed banks, (Awash, Dashen, Abyssinia, Wegagen, United, NIB, OIB and CBO), which represents 50 percent of the population, that completely ignore the remaining 50% of early established private commercial banks. In connection with this, the below data compiled and analyzed by the researcher from the audited financial statements of the respective banks and NBE annual reports revealed that the average ROE performance of the early developed private commercial banks over the last six years (2014 to 2019) resulted a higher results compared to some of the old and middle aged banks, while the top six scores in terms of average ROA held by the early established banks.

Table 1 Last Six years private banks average ROA and ROE

Rank	Yearly Return on Equity							Average ROE	Yearly Return on Asset							Average ROA
	List of Banks	13/14	14/15	15/16	16/17	17/18	18/19		List of Banks	13/14	14/15	15/16	16/17	17/18	18/19	
1	CBO	37.66%	31.57%	19.61%	16.22%	26.89%	23.22%	25.86%	BIB	3.88%	3.06%	4.93%	4.40%	2.67%	2.70%	3.61%
2	AIB	25.09%	21.44%	22.58%	24.08%	26.40%	30.16%	24.96%	DGB	2.10%	1.83%	5.41%	3.10%	4.00%	4.80%	3.54%
3	OIB	22.83%	24.20%	20.45%	18.56%	34.19%	23.66%	23.98%	Addis	4.14%	4.04%	3.72%	2.90%	2.96%	3.30%	3.51%
4	LIB	15.99%	27.30%	26.23%	21.04%	23.99%	24.68%	23.20%	LIB	2.93%	4.48%	3.86%	2.98%	3.09%	3.10%	3.41%
5	DB	28.64%	25.88%	26.56%	22.80%	18.84%	16.00%	23.12%	ZB	3.55%	3.48%	3.41%	3.21%	2.45%	3.60%	3.28%
6	ZB	21.25%	20.84%	26.77%	25.90%	18.00%	24.00%	22.79%	Bunna	3.19%	3.75%	3.47%	2.49%	2.76%	3.35%	3.17%
7	Bunna	18.35%	22.40%	22.16%	16.94%	18.90%	20.27%	19.84%	AIB	3.43%	2.79%	2.67%	2.81%	3.07%	3.74%	3.09%
8	BIB	20.61%	16.15%	25.49%	22.36%	16.04%	18.33%	19.83%	Enat	2.44%	4.95%	3.08%	2.49%	2.80%	2.57%	3.05%
9	UB	18.71%	16.64%	17.75%	16.74%	20.98%	22.08%	18.82%	CBO	5.22%	4.90%	2.53%	1.60%	2.20%	1.83%	3.05%
10	Abay	13.84%	20.99%	16.83%	16.07%	20.24%	23.54%	18.59%	Abay	2.17%	3.31%	2.76%	2.60%	3.03%	3.60%	2.91%
11	Abysi	20.16%	17.27%	18.58%	22.61%	15.74%	16.90%	18.54%	OIB	3.11%	2.91%	2.42%	2.12%	3.63%	2.68%	2.81%
12	WB	16.15%	16.63%	15.11%	21.98%	22.10%	15.29%	17.88%	WB	2.66%	2.89%	2.54%	3.09%	3.28%	2.17%	2.77%
13	NIB	16.92%	16.45%	15.80%	20.30%	16.26%	18.50%	17.37%	DB	3.34%	3.18%	2.86%	2.56%	2.32%	2.00%	2.71%
14	DGB	4.95%	8.60%	23.39%	13.45%	19.30%	25.14%	15.80%	NIB	3.07%	2.93%	2.64%	3.03%	2.16%	2.38%	2.70%

15	Addis	16.81%	15.53%	15.48%	13.04%	13.65%	15.86%	15.06%	Abys	2.45%	2.29%	2.38%	2.66%	1.96%	2.18%	2.32%
16	Enat	13.17%	14.36%	14.54%	12.41%	15.16%	14.81%	14.08%	UB	2.36%	2.04%	2.09%	1.96%	2.30%	2.40%	2.19%
Last six years private Banks average ROE									19.98%	Last six years private Banks average ROA						3.01%

Source: Compiled and computed by the researcher from audited financial statements and NBE reports

In addition, most of the reviewed studies didn't take into account the impact of foreign currency operation, which relays on the currency position and management of the bank, on the bank's profitability. In this regard, as the country in serious foreign currency crunch, commercial banks operating in Ethiopia are expected to earn significant portion of income from their international banking operations by imposing higher service charges.

Therefore, the purpose of this study is to find out the effect of bank specific variables and external factors on the profitability of private commercial banks' operating in Ethiopia and thereby to gather which variables behave differently with risk adjusted return. Hence, in order to fill the observed gaps; the researcher applied Return on Risk Weighted Asset (RORWA) as bank profitability measurement in addition to the most widely used variables of ROA and ROE. Moreover, additional bank specific independent variable of non-interest income to total income is considered in order to see the impact of international banking operation on the banks profitability. Regarding sample size, Kothari (2004) mentioned that small sample is any sample that includes 30 or less items. Accordingly, as the population size of the area under study has small number (16 private commercial banks) and to see the full picture of the area under study, unlike the previous reviewed studies conducted in Ethiopia, the researcher considered all private commercial banks operating in the country.

1.3 Research Questions

The following specific research questions are formulated to address the research problems.

- What effect does bank specific factors have on the private commercial banks performance?
- What effect does macroeconomic factors have on the private commercial banks performance?

1.4 Objectives of the Study

The general objective of the study is to find out the effect of firm specific and macroeconomic factors on the profitability of private commercial banks in Ethiopia.

1.5 Specific Objectives of the study

The study considers the following specific objectives:

- ✓ To discover the effect of capital adequacy on the private commercial banks profitability.
- ✓ To evaluate the effect of non-performing loan on the private commercial banks profitability.
- ✓ To discover the effect of lean low cost on the private commercial banks profitability.
- ✓ To assess the effect of non-interest income on the private commercial banks profitability.
- ✓ To discover the effect of earning ability on the private commercial banks profitability.
- ✓ To assess the effect of liquidity on the private commercial banks profitability.
- ✓ To evaluate the effect of bank size on the private commercial banks profitability.
- ✓ To discover the effect of GDP on the private commercial banks profitability.
- ✓ To evaluate the effect of inflation on the private commercial banks profitability.

1.6 Research Hypotheses

Various researchers classified the factors that affect the profitability of commercial banks into two broad categories, internal and external factors. The “internal factors” are individual bank characteristics that are influenced by the internal decisions of management and board; while, the “external factors” are sector wide or country wide factors that are beyond the control of the company and affect the profitability of banks. Elshaday et al. (2018) noted that it would be difficult to manage banks and enjoy their benefits to the economy without understanding and managing both the factors that determine bank financial performance. Similarly, Boru (2014), mentioned that it is important to understand the banking sector profitability is being driven by factors related to the bank or external sources or both in order to take the required action, as the main objective of commercial banks is to maximize the shareholders' return.

Based on the reviewed empirical studies and existing theory, the researcher has framed the below alternative hypothesis.

- H1: Capital adequacy ratio has significant effect on profitability of Private Commercial Banks.

- H2: Non-performing loan has significant effect on profitability of Private Commercial Banks.
- H3: Lean low cost has significant effect on profitability of Private Commercial Banks.
- H4: Non-interest income has significant effect on profitability of Private Commercial Banks.
- H5: Earnings ratio has significant effect on Profitability of Private Commercial Banks.
- H6: Liquidity ratio has significant effect on Profitability of Private Commercial Banks.
- H7: Bank size has significant effect on profitability of Private Commercial Banks.
- H8: Real GDP has significant effect on Private Commercial Banks.
- H9: Inflation rate has significant effect on Profitability of Private Commercial Banks.

1.7 Significance of the Study

The study is useful in showing the relationship between the factors that determine profitability of Private Commercial Banks in Ethiopia, as measured by both traditional and risk based approaches, and to suggest the possible implications. Moreover, the study helps investors' (shareholders) investment decisions, selection of preferential banks by depositors and borrowers, and the banks' management way of looking in order to control and analyze financial data.

1.8 Scope of the study

The scope of the study was focused on the factors of capital adequacy ratio, non-performing loan ratio, operating cost to operating income, non-interest income to total income, NIM, liquidity ratio, and bank size as internal factors, and real gross domestic product and inflation rate as an external determinants of profitability of Private Commercial Banks in Ethiopia for the period covering from 2014-2019. These variables are assumed to consider core operational activities of the private commercial banks in order to attest the objective of the study. The period (2014-2019) was selected to consider all private commercial banks operating in Ethiopia, as the last two private commercial banks joined the industry in the year 2013, Enat Bank and Debub Global Bank.

The study excludes the two state owned banks, Commercial Bank of Ethiopia (CBE) and Development Bank of Ethiopia (DBE), with the reason that the former bank, CBE, is an old aged bank and also being favored by government policies, like not surrendering 30 percent of the monthly FCY inflow to the government (NBE Directives FXD/50/2017), not purchasing 27

percent of NBE bills for every loan disbursement at a five percent interest rate with a five year maturity period (NBE Directives MFA/NBEBILL/001/2011), getting a significant share of foreign currency allocation while allocating from NBE and others. Hence, considering CBE with the rest of private commercial banks could prejudice the findings.

Development Bank of Ethiopia (DBE) is established for the reason of performing developmental activities in line with the government policy. Hence, DBE is excluded from the study with the fact that the study aims to explore determinants of Commercial Banks' profitability only.

1.9 Organization of the study

The remaining part of this study organized as follows: the second chapter describes review of related literatures, Chapter three about description of the methodology employed by the researcher. Chapter four includes data description, analysis and interpretation. Conclusion and recommendation presented in chapter five.

CHAPTER TWO

Literature Review

2.1 Theoretical literature reviews

The financial performance of a bank is measured against its ability to mobilize financial resources from the public, deploy those resources into revenue-generating services, maximize profits from such offerings through effective income and expenditure measures, and ensure efficient capital management to deliver satisfactory returns to shareholders. In this regard, different studies were conducted around the world on the determinants of commercial banks profitability to identify the factors that affect the banks' profitability. According to the literatures, determinants of commercial banks profitability are broadly classified in two parts, internal and external factors. The internal determinants are considering the factors those are influenced by the decision of management or board and objective of the bank policy. On the other hand, external determinants are factors those cannot be managed by the decision of the management and the bank policy objective.

2.1.1 Bank performance Indicators

Fadzlan & Muzafar (2010); Artor Nuhui et al. (2017); Chinoda, (2014); Tamiru, (2013); Boru, (2014); Abdissa (2016); Elshaday (2018); Million (2015); Moges (2017); and others, used Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) as bank performance indicators. The reviewed literatures showed that these performance indicators have their own advantage and drawbacks as compared to each other, but the common thing is they were not considered the risk factors.

According to the European Central Bank (2010), risk appetite with the business structure and strategy of a bank were not considered in the traditional methods of performance measurement tools. Islam et al; (2017), stated that ROA reflects misleading information due to the income generated from off-balance-sheet activities. From banks perspective, off-balance sheet activities include items such as letters of credit, cash against document and revolving underwriting facilities. As a result, the income generated from off-balance sheet activities improve the earnings ratios, because of consideration of the service charges in the numerator, while the

balance of total assets remains unchanged. On the other hand, Flamini et al; (2009), noted that an analysis of ROE disregards financial leverage and the risks associated with it.

Similarly, Klaassen & Van (2015), noted that the commonly used performance metrics to measure bank performance completely ignores risk. Considering risk adjusted measure of bank performance, in addition to the risk neutral factors, could enable investors, depositors and stakeholders to have a real picture of their economic decision. Moreover, Ahmad et al., (2016) stated that the traditional performance measures become more robust and serve as measures of bank stability when they are risk adjusted. Risk-adjusted returns are taking into account the level of risk associated with banks, like Return on Risk Weighted Assets (RORWA).

2.1.1.1 Return on Asset (ROA)

Return on Asset (ROA) is an indicator of how profitable a company is relative to its total assets. Ahmad et al., (2016) and Goyal et al., (2016), noted that Return on Asset measures a bank's overall profitability by using the available resources, and informs the shareholders how well these resources being utilized by the management. ROA considers various types of tangible and intangible balance sheet asset items of the bank. But, according to Nicolae et al; (2015), Flamini et.al; (2009) and Elsiefy (2013), a major drawback of ROA is not looking the bank's exposure to off-balance sheet items and related risks, which could be a major source of income for commercial banks.

2.1.1.2 Return on Equity (ROE)

Return on Equity (ROE) is a profitability metrics that demonstrates how much profit a company generates from the equity of shareholders'. According to the European Central Bank (2010), ROE is an internal performance measure of shareholder value. But, Flamini et al; (2009), noted that an analysis of ROE disregards financial leverage and the risks associated with it. Moreover, Tewodros and Gedion (2019), mentioned that banks with lower leverage will generally report higher ROA, but lower ROE, as ROE is the result of ROA and leverage ratio ($ROE = ROA \times LR$).

2.1.1.3 Return on Risk Weighted Asset (RORWA)

Return on Risk Weighted Asset measures the overall level of risks of the bank by including off balance sheet items, like guarantee, loan and advances and other commitments. As per NBE Directive No SSB/9/95, risk weighted assets of a bank is calculated based on the weight of the

risk assigned by the regulatory body to each items. According to Elsiefy (2013), RORWA ratio has its own advantages as compared to the ROA. The denominator of total assest dosen't take the asset risk profile factor into account and could unfairly favor those banks taking higher risks to boost earnings and penalize those banks taking lower risk to generate consistant earnings.

2.1.2 The Internal Determinants

According to previous studies, the internal determinants of bank performance can be defined as the factors that are influenced by the decision of the banks' top management or board. Nadeem et al; (2013), noted that these managements induced determinants on the commercial banks performance can be analyzed through comprehensive analysis of statement of financial position and through statement of comprehensive income. In this regard various studies have been conducted by considering different variables as internal factor. According to Malihe, (2015), these internal variables can be summarized under the 'CAMEL' approach, as the model can help managers to control and analyze financial data and organizational position in an industry.

CAMEL is an international rating system used by regulatory banking authorities to rate financial institutions, and same also being used by the Ethiopian regulatory body (NBE) while inspecting the performance of commercial banks. Moreover, NBE recently announced that the CAMEL approach will be applied to rate the transition of MFIs to banks in Ethiopia, as the method helps to measure and indicate the strength and weakness of the organizations, Malihe (2015). CAMEL stands for capital adequacy, asset quality, management efficiency, earnings and liquidity.

2.1.2.1 Capital Adequacy Ratio

Capital adequacy is one of the internal factors influencing banks' profitability. The NBE directive (SBB/9/95) mentioned that capital adequacy ensures the efficiency and stability of a nation's financial system by reducing the possibility of banks being insolvent. Similarly, Elsiefy (2013) noted that capital adequacy is the ultimate line of protection against any losses from credit risk, market risk, operational risk, or other sources of risks. Hence, higher capital adequacy ratio is an indicators of capital strength and provides sufficient cushion to protect creditors from future potential losses. According to Tan (2015), the positive relationship between capital and bank profitability is expected due to having higher capital reduces the cost of fund, increase the risk absorbing capacity and reduces bank's dependency on liability.

In this regard, Burger (1995) argues that a higher capital ratio tends to reduce the risk on equity and therefore lowers the equilibrium expected return on equity. Flamini, (2009), noted that in imperfect capital markets, well-capitalized banks need to borrow less in order to support a given level of assets, and tend to face lower cost of funding due to lower prospective bankruptcy costs. Hence, well-capitalized banks are less risky and profits expected to be lower because they are perceived to be safer, as a result expects a negative association between capital and profits.

The capital adequacy ratio of ‘capital to risk weighted assets’ and ‘capital to total assets’ were being used by different researchers across the globe, like Abdissa (2016); Elshaday (2018); Boru (2014); Million (2015); Ahmad et al (2016); Artor et al (2017); Brahmana (2018); Delis (2005), and others. In this regard, the NBE has set specific measure of the capital adequacy position of Banks on its Capital Adequacy Ratio directive number SBB/9/95. The directive clearly set out the computation mechanism for both on and off-balance sheet items and strictly set for all banks not to maintain their capital level below 8% of their risk weighted assets at any times. The capital of a bank consists of issued and fully paid in shares, legal reserves and other reserves to be approved by the National Bank of Ethiopia. The main reason for setting the minimum rate for the ratio is to make sure banks are in cushion to absorb reasonable amount of loss in drastic situation to protect the interest of depositors, creditors and the public in general and promote the public confidence on the financial institutions.

2.1.2.2 Asset Quality Ratio

The bank balance sheet asset part includes various items like cash, account receivables, fixed assets, inventories, loan and advances, investment, and others. But, significant portion of the assets part is covered by loan and advances, which is a source of major profit through interest income. As a result, more attention is given to loan and advances by various researchers. In the study of Boru (2014), loan and advances is the core operational area of commercial banks that will bring sever risk on the going concern of the banks as a result of not making the required follow-up to take corrective measures. Dang (2011), noted that the greatest risk facing the bank is the risk of loan losses derived from the delinquent loans. The NBE directive (SBB/43/2008) stated that loans and advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with repayment term is in question become NPL. Hence, commercial banks are highly concerned on the amount of nonperforming loans because of its inverse relationship with profitability.

The NBE directive classified the loan and advances status in five groups as pass, special mention, substandard, doubtful and loss. According to the loan and advances status, the minimum provision percentage against the outstanding amount of each loan and advance ranges from 1% to 100%.

2.1.2.3 Management Efficiency Ratio

Management Efficiency is one of the key internal factors that determine the bank profitability. But, measuring the management efficiency through financial ratio becomes a complex subject, Ongore (2013). Moreover, Malihe (2015), states that quantifying the quality of management is difficult since management is a qualitative problem, such as the willingness to take risks. As a result, various researchers used various financial ratios to measure the management efficiency. Among which, total operating revenue to total profit (Ongore, 2013), the ratio of non-interest expense to total expense (Tesfaye, 2014), the ratio of operating expense to total assets (Delis 2005, Marshal 2016, Fedzlan and Muzafar 2020 and Nadeem 2013), the ratio of cost to income (Ahmad et al 2016, Artor et al 2017, Sanni et al 2020, Abdissa 2016 and Nicolae 2015).

According to Elsiefy (2013), the ratio of operating cost to operating income is an indicator of how much revenue is generated from operating expenses. This ratio was used by various researchers as a proxy of measurement of management efficiency. It's believed that banks would enjoy higher returns when they have better cost management, as a lower ratio suggests better cost control. On the other hand, the studies of Tewodros and Gedion (2019), Akbas, (2012), Marshal (2013), Artor (2017) and Elshadey (2017) indicates that the higher the ratio of OC_OI considered as an indicator of weak management efficiency in controlling operational related expenses, which lower the bank profitability.

2.1.2.4 Net interest Margin

Goyal et al., (2016), noted that one of the bank's primary functions is to mobilize resources from the depositors and use the proceeds on income earning assets. Therefore, NIM is the difference between interest income and interest expenses as a percentage of total assets (earning assets). The income generated from loan and advances has always an opportunity costs of the expense paid to the depositors. Hence, a key measure of the success of this intermediation function is the spread between the income from earning assets to the cost rate on interest-bearing sources of

funds. Elsiefy (2013) stated that a bank with stable and growing NIM is viewed more profitable than competitors.

2.1.2.5 Liquidity Ratio

Liquidity position indicates the ability of the bank to meet its financial obligations in a timely and effective manner. According to Malihe (2015) Liquidity risk measures an institution's ability to meet unanticipated funds that are claimed by depositors. Differences among scholars are observed while determining the ratio that measure liquidity. Some of them used the ratio of loan to deposit; others applied the ratio of liquid assets to total assets. But, in Ethiopia context there is a clear measure of the liquidity: the liquid asset to short term liabilities, on which the National Bank of Ethiopia has set the minimum liquid asset of the Bank not to be less than 15% of the Bank's net current liability (Directive No SBB/57/2014). The directive stated that liquid assets include cash, deposit with NBE and other local and foreign banks, and treasury bills. On the other hand, current liability includes current, saving and time deposits and similar liabilities with less than one-month maturity.

2.1.2.6 Bank Size

Menicucci & Paolucci, (2016) noted that large bank has more opportunities of a growth in profitability as a result of economies of scale. This economies of scale lead to market power. Having huge amounts of assets generally control a large portion of the market. Moreover, larger banks are able to take advantage of higher production and loan diversification opportunities. As a result, the unit costs of large scale banks are likely to be lower than those of smaller banks, their profitability ratio will be higher. Moreover, Elshaday et al; (2018) and Moges (2017) states that there is positive relationship between bank size and profitability because of the bigger banks have more economies of scale. Similarly, Flamini et al; (2009), mentioned that if larger banks have a greater proportion of the domestic market, and operate in a non-competitive environment, lending rates may remain high (while deposit rates for larger banks are lower because they are perceived to be safer) and consequently larger banks may enjoy higher profits. But, Amel et al., (2004), noted that banks that become too large may face lower return as a result of management complexities and bureaucracy. On the relationship between bank size and profitability, previous studies are mixed. Non-significant relationship identified by Delis (2005), Nicolae (2015), Boru (2014) and Ahmad (2016). On the other hand, positive strong relationship was identified by Elshaday (2018), Moges (2017) and Menicucci et al., (2016).

2.1.1 External Determinants of Bank Performance

External variables are sectoral or national variables that are outside the control of the company and influence the profitability of banks.

2.1.1.1 Economic Growth

The positive relationship between economic growth and Bank performance is supported by most of previous literatures. According to Delis 2005, the trend of GDP affects the demand for banks asset. During boom period the demand for credit is expected to be high compared to recession. Therefore, revenues could grow faster than costs leading to increased profits, while the opposite may hold true during economic slowdowns. According to Flamini, (2009), when GDP growth slows down, and, in particular, during recessions, credit quality deteriorates, and defaults increase, thus reducing bank returns. Similarly, Tamiru (2013) noted that Real growth rate in GDP is expected to influence numerous factors related to the supply and demand for loans and deposits. Hence, favorable economic conditions will affect positively the demand and supply of commercial banks services.

2.1.1.2 Inflation

The effect of inflation is another important determinant of bank performance considered in this study. Inflation is a continuous increasing the price of goods and services. The impact of inflation could be reflected on the saving culture of depositors, loan repayment capacity of the borrowers, and banks resource mobilization activities. According to Oner (2010) inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. Moreover, according to Valentina (2009), inflation affects bank profitability depends on whether future movements in inflation are properly anticipated, which is highly depends on the firms forecasting ability about the future movements and correction measures to overcome its impact. An inflation rate that's completely expected raises benefits as banks can fittingly alter interest rates in order to arrange to extend incomes, whereas an unforeseen alter seem raise costs due to flawed interest rate alteration.

2.2 Review of Empirical Studies

This part of the study summarizes various studies conducted in different part of the world related with determinants of banks profitability.

2.2.1 Review of Empirical Studies conducted outside of Ethiopia

The study of Artor Nuhui et al, (2017) indicates that profitability of commercial banks mostly driven by bank specific factors. In order to investigate the impact of determinant factors on banks' financial performance, the researcher used ten Kosovo commercial bank data for the period 2010-2015. The researcher used multiple regression to analysis the raw data of the three performance indicators: ROAE, ROAA and NIM. It was found that the capital adequacy ratio and liquidity ratio had a negative effect on commercial banks' financial performance. Regarding macroeconomic factors, GDP and inflation, found to have positive relationship with all the three performance indicators but their impact on financial performance of commercial banks is insignificant. The results indicate that profitability of commercial banks in Kosovo can be improved by increasing the quality of assets, improving expense management and liquidity. The study concludes that management efficiency and asset quality are the determinant factors that have the greatest impact on financial performance of commercial banks.

The research conducted by Fadzlan & Muzafar, (2010) identified that the macroeconomic indicators have no significant impact on bank profitability, except inflation, which has negative relationship with Bangladeshi banks profitability. In order to identify the determinant factors, the researcher used 37 Bangladesh commercial banks for the period covering from 1997 to 2004. The study revealed that loans intensity, credit, and cost have positive and significant impacts on bank performance. But non-interest income exhibits negative relationship with bank profitability. The study also suggests that the impact of size is not uniform across the various measures, but found negatively affects return on average equity (ROAE), return on average assets and net interest margin.

Sayilgan (2009), used Turkish banking sectors with 6 years' data, from 2002-2007, to study the micro and macro variables impact on the banks performance. The study identified that profitability of the banking sector increased along with declining inflation rate. On the micro independent variables, profitability seems to have been positively affected by capital adequacy in broad terms and negatively by growing off-balance sheet assets.

The study of Nicolae Petriia et al, (2015), identified that credit and liquidity risk, management efficiency, market concentration/competition and the economic growth have influence on bank profitability, as measured by both ROAA and ROAE, of EU commercial banks (27 member

states) over the period covering from 2004 to 2011. The size of banks doesn't affect ROAE and has a small effect in the case of ROAA but credit risk has a negative, statistically significant impact on bank performance. CAR has not statistically influence the shareholders return. The income generated from the off balance sheet activities, operating income, strongly influenced the bank profitability as measured by ROAA and ROAE. The GDP growth has a positive effect on bank profitability, while the inflation seems not to influence the performance.

Marshall (2013), was conducted a study on 20 banks in Nigeria between 2006 and 2012 by employing econometric model of fixed effect regression model on a panel data (comprising cross-sectional and time-series data). The result revealed that bank capital, expenses management, interest rate and the economic situation of the country have statistically significant effect on profitability. Bank's capital and GDP were identified with positive and significant effect on profitability contrary to the expenses management and bank size variables, which has statistically significant negative effect on banks profitability.

The research conducted by Chinoda, (2014) on the determinants of profitability of commercial banks in Zimbabwe revealed that liquidity, size, inflation, and GDP growth rate has a positive relationship with profitability, except expenses management. Size and inflation has a strong positive relationship with profitability. The researcher considered balanced panel data from 2009 to 2012 of five commercial banks which was analyzed using multiple linear regression method.

The study of Ongore, (2013) showed that capital adequacy and management efficiency, positive, and asset quality, negative, significant effect on the performance of banks in Kenya. But, liquidity management found to have no significant effect. Among the macro-economic factors, GDP had a negative correlation with ROA and NIM and positive with ROE. But, the relationship was not significant. However, the other variable, inflation, had relatively strong negative correlation with financial performance of commercial banks.

Menicucci & Paolucci, (2016) has conducted a study to examines the impact of bank-specific characteristics (internal factors) on European banks' profitability. Factors affecting bank profitability have been analyzed in a multiple regression model by using a sample of banks operating in Europe in the period 2006-2015. Panel data estimation has been applied to 28 large European banks, analyzing the crosssectional and time series data for the mentioned period. The

sudy identified that bank size is one of the variables that determine the European banks'. As a result of the economies of scale, large banks took the advantage of differentiation of their products and services. Asset quality, a proxy measure of credit risk, negatively affects the European banks' profitability. The other bank specific variable, deposit ratio, identified with positive and strong impact on ROE. Capital strength, measured by equity to total assets, strongly influenced the bank profitability. Banks with higher capital reduces cost of debt that in turn increases profitability. But, the ratio of net loans to total assets does not explain the variability of profitability measured by ROE.

The study of Brahmana et al., (2018) on income diversification of Malaysian banks performance for a period of 2005-2015, identified that income diversification increases bank's performance. The study had been conducted by using capital adequacy ratio, loan to debt ratio and non-performing loan as control variable; and adjusted risk return on asset and adjusted risk return on equity as profitability measures. All control variables, except NPL, shows positive and significant relationship with bank performance. Similarly, Prajapati & Kumar, (2019) analysed the impact of income diversification on risk adjusted profitability of commercial and development banks in Nepal. The result revealed that non interest income, equity multiplier, and foreign holding have significant positive impact on RAROE of commercial banks. Whereas, the size of banks has significant negative impact on RAROE and RAROA. Debt ratio doesn't have significant impact in case of RAROE, and equity multiplier, debt ratio and foreign holding do not have significant impact on RAROE.

In addition, Ahmed et al, (2016) conducted their study on determinants of bank profitability, regressed profitability against bank-specific variables (capital adequacy, cost-income ratio, liquidity ratio, loan loss reserve ratio, and bank size) and macroeconomic variables (gross domestic product, inflation and bank concentration) by using robust measure of profitability, risk adjusted return on asset. They concluded that among the eight explanatory variables, five variables (equity to total assets, size and concentration ratio - positive, cost to income ratio and net loans to deposit ratio -negative) significant effect on RAROA of East Asia banks. In Latin America, all three macroeconomic variables, gross domestic product, inflation and bank concentration, positively and cost to income ratio negatively affects RAROA.

2.2.2 Review of Empirical Studies conducted in Ethiopia

On the study of Moges (2017), seven commercial banks operating in Ethiopia for the period covering from 2005-2014 was considered in order to assess the impact of bank specific and macro-economic factors on the profitability of Ethiopian private commercial banks. The researcher used return on asset (ROA) and return on equity (ROE) as dependent variables. Both descriptive and panel econometrics method of data analysis were used. Random effect panel data analysis was used for the econometric analysis. The researcher identified that interest rate spread and loan to deposit ratio negatively affects the return on asset and return on equity. Bank size positively and significantly affects the profitability. Loan concentration has positive and significant effect on the return on equity of private banks, while insignificant effect on banks return on asset. On the same topic, Tamiru (2013), used eight commercial banks operating in Ethiopia for the period between 2005 and 2010. The study identified that loans and advances have significant effect, whereas, the current deposit negative and insignificant impact on the profitability of commercial banks. Asset management positively affect the performance of commercial banks. GDP identified with significant negative effect on the banks profitability, because its effect depends on the economic conditions prevalent in the economy. The general rate of inflation negatively affects profitability although it was insignificant.

Abdissa (2016), applied balanced panel data of eight Ethiopian commercial banks for the period of 2002 - 2012. The study used ordinary least square (OLS) technique to see the impact of the factors on profitability of Ethiopian commercial banks by using ROA and NIM as a profitability measure. The study identified that except expense management, regulation and credit risk, all the considered bank specific independent variables had positive and significant relationship with profitability. Those three variables, expense management, regulation and credit risk, found to have negative and significant relationship with the performance of commercial banks. On the other hand, the macroeconomic variables, economic growth, interest rate spread and exchange rate, had positive and strong relationship with profitability.

The study made by Boru (2014), on the determinants of Ethiopian bank performance for the period 1990-2012 by using both descriptive and econometrics techniques found that bank specific variables by large explain the variation in profitability. On the other hand, bank size and macro-economic variables such real GDP growth rates have no significant impact on banks

profitability. Among the external determinant factors, inflation has found significant effect on the bank's performance. Provision to total loans, share of service charge to total income and the non-interest expense to total expense were significant and considered to be drivers of the banks' profitability in Ethiopian banking industry. The capital adequacy ratio and the loan to deposit ratio were insignificant to explain profitability. The ratio of service charge to gross income which is used to measure income from foreign operation has a positive impact on profitability. On the other hand, strong and negative relationship identified between the ratio of non-interest expense to total expense and profitability, which is a proxy measure of management efficiency.

Elshaday et al, (2018) noted that bank size, leverage ratio and credit interest income have positive and statistically significant impact on the financial performance measured by return on equity. Loan loss provision and NPL has statistically significant negative effect on return on assets. Ratio of debt to asset, a measure of leverage, negatively correlated with the profitability measured by ROA. The study was conducted on ten private commercial banks in Ethiopia for a period covering from 2007 to 2016.

2.3 Summary of literature and Gap identified

The financial performance of a bank is measured against its ability to mobilize financial resources from the public, deploy the resources into revenue-generating services, maximize profits from such offerings through effective income and expenditure measures, and ensure efficient capital management to deliver satisfactory returns to shareholders. Various researchers classified the factors that affect profitability of commercial banks in two broad categories, internal and external factors. The "internal factors" are individual bank characteristics which basically are influenced by the internal decisions of management and board. While, 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 previous studies have been conducted by examining a set of bank specific variables and macroeconomic factors. Most of the studies agreed that the bank's profitability has been highly dependent on the internal factors (bank specific variables).

Almost all the previous reviewed studies conducted in Ethiopia applied the most widely used dependent variables to measure bank's profitability, ROA and ROE, which are considered as traditional methods due to not showing the consistency of risk appetite with business structure and strategy of a bank. Moreover, some of the reviewed studies were not followed the regulatory

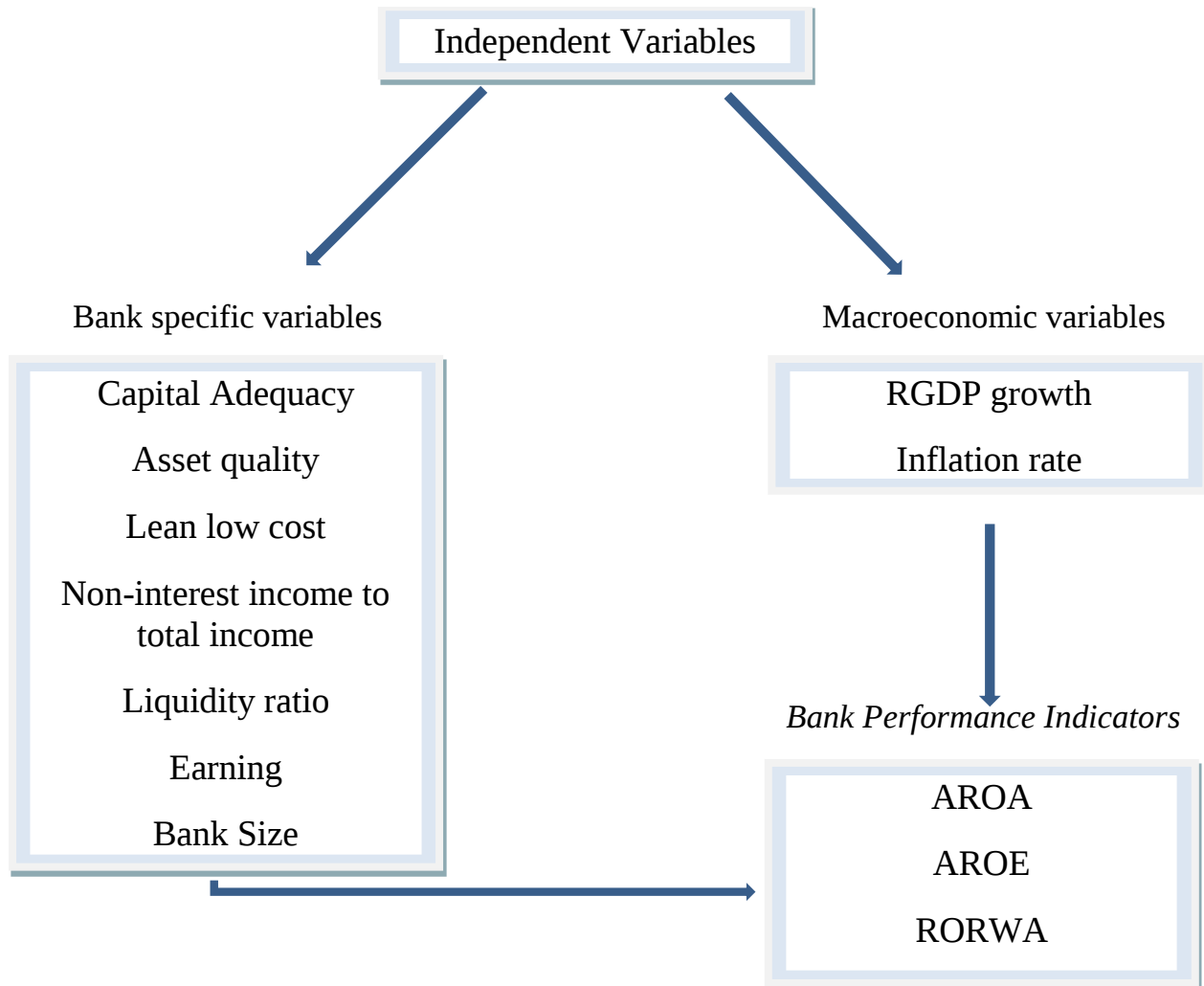
body standard rules while computing different internal factors that determine profitability of commercial banks. For instance, using loan to deposit ratio as measurement of liquidity instead of liquid assets to short term liability as mentioned on the NBE directive. Moreover, equity to total assets was used as measurement of CAR instead of equity to risk weighted assets. In addition, net interest income to total loan and advances was used to measure NIM instead of net interest income to total earning assets, as commercial banks generating interest income from various sources, like from deposits at local and foreign banks, investment on treasury bills, government bonds and others.

On the other hand, the reviewed studies, like Boru (2014); Tamiru (2013); Moges (2017); Elshaday (2018), Abdissa (2016), and Tewodros and Gedion (2019), used a sample technique (purposive) that mainly focused on the long and middle stayed banks, (Awash, Dashen, Abyssinia, Wegagen, United, NIB, OIB and CBO), which represents 50 percent of the population that completely ignore the remaining 50 percent of early established private commercial banks. Moreover, most of these studies not considered the impact of international banking operations on the bank's profitability.

2.4 Conceptual Framework

The conceptual framework developed from the above reviewed literatures is presented in the below diagram. As mentioned in the previous part, in this study the dependent variable includes ROA, ROE and RORWA. Capital adequacy, non-performing loan ratio, income from foreign trade (determined as non-interest income), liquidity, NIM, operating cost to operating income, and bank size are considered as bank specific independent variables. Moreover, external determinants of profitability factors like, inflation and real GDP are considered. The researcher assumed these variables indicate the full picture of the area under study, as the variables touch major operational areas of the banks' operations and macroeconomic activities that would play vital role on the banks' profitability in Ethiopia context. The purpose of the study is to evaluate the factors that influence the profitability of private commercial banks in Ethiopia.

Figure 1 Conceptual Framework



Source: Compiled by the researcher from the reviewed literatures

Chapter Three

Research Methodology

3.1 Introduction

In this chapter research design, sources and method of data collection, target population of the study, method of data analysis, variable definition and hypothesis of the study and model specification are presented.

3.1.1 Research Design

Assumptah and Muhari (2017) stated that research design is a plan outlining how information is to be gathered for an assessment or evaluation. Research design includes identifying the data gathering method(s), the instruments to be used, how the instruments would be administered, and how the information would be organized and analyzed. Moreover, Kothari, (2004) noted that research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research objective.

According to Saunders et al., (2003), explanatory study appears the best option in search for causal research among others, exploratory and descriptive research designs. In addition, Creswell (2003) mentioned that the emphasis of explanatory research design is on studying a situation or a problem in order to explain the relationship between variables or to test whether one event causes another. Therefore, explanatory research design is found suitable for the objective of this research and to test the designed hypothesis, as the study aims to determine the effect of internal and external factors through establishing a causal link with the banks financial performance measures.

3.1.2 Sources and Method of Data Collection

The necessary data is collected from the audited financial statements of the respective private commercial banks, NBE reports, Central Statistical Agency (CSA) and Ministry of Finance and Economic Development (MOFED) for the period covering from 2014 to 2019. The period bounded for six years with the reason to apply census approach, as the last two private commercial banks joined the industry in the year of 2013. As the required data to conduct the study is collected from published and audited financial reports, secondary sources, the researcher is used quantitative data collection method.

3.2 Target population and sampling frame

The target population of the study is all private commercial banks operating in Ethiopia. According to the recent NBE report (2018/19), there are 16 private commercial banks, namely, Awash Bank (AB), Dashen Bank (DB), Wegagen Bank (WB), Bank of Abyssinia (BOA), United Bank (UB), Nib international Bank (NIB), Cooperative Bank of Oromia (CBO), Oromia International Bank (OIB), Lion International Bank (LIB), Zemen Bank (ZB), Buna International Bank (BUIB), Birhan International Bank (BIB), Abay Bank (ABB), Debub Global Bank (DGB), Enat Bank (EB) and Addis International Bank (AdIB). According to Kothari (2004), small sample is a sample that includes 30 or fewer items. Moreover, Kumar (2011) mentioned that the greater the sample size, the accurate the estimate of the true population. As a result, the population size of the area under study small in number, 16 private commercial banks, and in order to see the full picture, the researcher applied a census approach.

3.3 Data Analysis Techniques

To test the proposed hypotheses, both descriptive statistics and econometrics methods of data analysis were carried out. Kothari (2004) noted that descriptive statistics methods help the researcher in developing certain induces from the raw data. Hence, descriptive statistics of the variables, mainly mean, maximum, minimum and standard deviation, were calculated over the sample period. On the other hand, Gujarati (2004) noted that panel data analysis has the advantage to study the behavior of each variable across space and time. Moreover, Brooks (2008) mentioned that the panel data model has the advantage to minimize the problem of multicollinearity that may arise if time series are modeled individually. Besides, panel data gives more informative data, more variability, less collinearity among the variables, more degree of freedom, more efficiency and controlling individual heterogeneity, as mentioned by Baltagi, (2005). The collected data from different sources were analyzed using Eviews software.

3.4 Bank performance Indicators

In the literature, banks profitability, typically measured by return on asset and return on equity. Return on Asset is an indicator of how profitable a company is relative to its total assets; and Return on Equity is a profitability metrics that demonstrates how much profit a company generates from the equity of shareholders. But, as these two methods not showing the consistency of risk appetite with business structure and strategy of a bank, the researcher has

considered a new variable of return on risk weighted asset, as it measures the overall level of risks of the bank. Hence, in this study the above three performance measurement variables (ROA, ROE and RORWA) were considered to determine the factors that affect banks' profitability from different perspectives.

- **Return on Risk Weighted Asset (RORWA)**

RORWA measures the overall level of risks of the bank including off balance sheet items, like guarantee, letter of credit, cash against document, and others. As per NBE Directive No. SSB/9/95, risk weighted assets of a bank is calculated based on the risk weight assigned by the regulatory body to each on and off balance sheet items. RORWA is calculated as net income to risk weighted assets (Elsiefy 2013).

$$RORWA = \frac{\text{Net Income}}{\text{Risk Weighted Assets}}$$

- **Average Return on Asset (AROA)**

Return on Asset (ROA) is an indicator of how profitable a company is relative to its total assets. Ahmad et al., (2016) noted that Return on Asset measures a bank's overall profitability and reflects how well management uses its real investment resources to generate profits. Moreover, according to Goyal et al., (2016), ROA plays significant role in informing the owners of a bank whether their bank is being managed well. A higher ratio indicates the better income generating capacity of the assets and better efficiency of management. ROA considers various types of tangible and intangible balance sheet asset items of the bank.

$$AROA = \frac{\text{Net Income}}{\text{Average Total Asset}}$$

- **Average Return on Equity (AROE)**

Return on Equity (ROE) is a measure of profitability that shows how much profit a company generates with the shareholders' equity. According to the European Central Bank (2010), ROE is an internal performance measure of shareholder value.

$$AROE = \frac{\text{Net Income}}{\text{Average Total Equity}}$$

3.5 The Internal Determinants

According to various researchers, the internal determinants of bank performance can be defined as the factors that are influenced by the decision of the management or board and objective of the bank policy. This study followed the CAMEL approach, as it's an international rating system used by regulatory banking authorities to rate financial institutions, and same also being used by the Ethiopian regulatory authority while inspecting the performance of commercial banks. Each of the internal factors considered in this study is described below:

- **Capital Adequacy**

According to NBE Directive No SSB/9/95, capital adequacy ratio ensures stability of the financial system by lowering the risk of banks becoming insolvent. Elsiefy (2013) noted that capital adequacy is the ultimate line of protection against any expected losses from credit risk, market risk, operational risk, or other sources of risks; hence, higher capital ratio indicates capital strength and provides sufficient cushion to protect creditors from future potential losses. According to Boru (2014), the regulatory measures that insist on holding a high level of capital seems to strengthen the risk bearing capacity of banks than improving their profit performance. Similarly, Nicolae (2015) mentioned that a high capital adequacy may reduce the risk of the bank, but, in the same time the shareholders do not benefit from the leverage effect. From the above argument, in this study a negative and significant relationship is anticipated. Capital adequacy is calculated as capital to risk weighted assets.

$$CAR = \frac{\text{Capital}}{\text{Risk Weighted Assets}}$$

- **Asset Quality**

The empirical review evidenced that banks asset quality is one of the internal factors that significantly affects profitability. The more non-performing loans the higher provision. When the level of NPL increases the amount of provision held by the banks also increases, which negatively affects the bank's profitability. In the study of Boru (2014), loan and advances will bring sever risk on the survival of the banks as a result of not making the required follow-up and using various risk mitigation factors in order to take the required remedial action. Moreover, Elshaday (2018) mentioned that when the amount of non-performing loan increases the interest income that the banks get from these loans will decrease. This would in turn affect the bank's profitability. In this study, the researcher applied the ratio of non-performing loan to total loan

and advances to measure the asset quality of the bank and a negative and strong relationship is anticipated.

$$\text{Asset quality} = \frac{\text{Non Performing Loan}}{\text{Total loan and advances}}$$

- **Management Efficiency Ratio**

Ongore (2013) stated that Management Efficiency is one of the key internal factors that determine the bank profitability but appears to be a complex subject to capture with financial ratios. Different researchers use various financial ratios of the financial statements to measure the management efficiency. Among which, total operating revenue to total profit (Ongore, 2013), the ratio of non-interest expense to total expense (Tesfaye, 2014), the ratio of operating expense to total assets (Delis 2005, Marshal 2016, Fedzlan and Muzafar 2020 and Nadeem 2013), the ratio of cost to income (Ahmad et al 2016, Artor et al 2017, Sanni et al 2020, Abdissa 2016 and Nicolae 2015). In this study, the researcher used the ratio of operating cost to operating income, as proxy measure of management efficiency. Moreover, the ratio of non-interest income to total income is applied to measure the bank's ability in diversifying its income. The author expected positive relationship with profitability for non-interest income to total income, whereas, negative relationship presumed from operating cost to operating income.

- **Liquidity Ratio**

Liquidity ratio reflects the liquidity position of a bank. Researchers have used various methods to compute the liquidity ratio. Artor et al, 2017 and Boru, 2014 were used liquid Assets to short-term liabilities; Ongore, 2013, Million Gizaw et al, 2015, Moges, 2017 and Ahmad, Shaharuddin, & Koh, 2016, applied the ratio of total loans to total customer deposit. Moreover, Abdissa 2016, and Bekalu et al, 2017 were used liquid assets to total asset. According to researchers used a ratio of loan to deposit, a higher ratio indicates that a given bank is relatively distributing more of its deposits in the form of interest bearing loans. So the bank generates more income. On the contrary, a very low ratio means the bank is at low risk but is highly liquid. This means banks are not utilizing their assets on a better income generating activities. In the Ethiopian context there is a clear measure of the liquidity, the liquid assets to short term liability. In this regard the National Bank of Ethiopia has set the minimum liquid asset of the Bank not to be less than 15% of the Bank's net current liability (Directive No SBB/57/2014).

In order to comply with the regulatory directive, in this study the ratio of liquid asset to current liabilities was applied to measure the banks' liquidity. Moreover, a negative and strong influence on profitability is anticipated.

$$\text{Liquidity ratio} = \frac{\text{Liquid Assets}}{\text{Short term liabilities}}$$

- **Net interest Margin (NIM)**

Goyal et al., (2016), noted that one of the bank's primary intermediation functions is to issue liabilities and use the proceeds to purchase income earning assets. Therefore, NIM is the difference between interest income and interest expenses as a percentage of total assets (earning asset). Elsiefy (2013) stated that a bank with stable and growing NIM is viewed more profitable than competitors, as the key measure of the success of this intermediation function is certainly the spread between the yield on average earning assets to the cost rate on interest-bearing sources of funds. In this study, positive and significant influence on profitability is presumed.

$$\text{Net interest margin} = \frac{\text{Interest Income} - \text{Interest Expense}}{\text{Earning Assets}}$$

- **Bank Size**

Elsahday et al; (2018), Menicucci & Paolucci, (2016), and Moges (2017) noted that larger banks are able to take advantage of higher production and loan diversification opportunities, economies of scale. As a result, the unit costs of large scale banks are likely to be lower than those of smaller banks, their profitability ratio will be higher. Similarly, Flamini et al; (2009), mentioned that if larger banks have a greater proportion of the domestic market, and operate in a non-competitive environment, lending rates may remain high (while deposit rates for larger banks are lower because they are perceived to be safer) and consequently larger banks may enjoy higher profits. But, unlike the above scenarios, Amel et al., (2004), noted that banks that become too large may face lower return as a result of management complexities and bureaucracy. A mixed result is observed on the relationship between bank size and profitability. Non-significant relationship identified by Delis (2005), Nicolae (2015), Boru (2014) and Ahmad (2016). On the other hand, Elshaday (2018), Moges (2017) and Menicucci et al., (2016) have noted positive and strong relationship. Based on the above argument, in this study the researcher expected a strong positive relationship with profitability and applied logarithm of total assets to compute bank size.

3.6 External Determinants of Bank Performance

According to previous studies, the external factors are sector wide or country wide factors which are beyond the control of the company and affect profitability of banks. In this study the below macroeconomic variables are considered.

- **Economic Growth**

GDP is a measurement of all finished goods and services produced within a specific country in a given year. According to Flamini, (2009), when GDP growth slows down, and, in particular, during recessions, credit quality deteriorates, and defaults increase. Thus, the amount of provision will soar and reducing bank returns. Similarly, Tamiru (2013) noted that Real growth rate in GDP is expected to influence numerous factors related to the supply and demand for loans and deposits. Favorable economic conditions will affect positively on the demand and supply of commercial banks services, especially on intermediary businesses. Hence, the possibility of positive turnover on the commercial banks operation is highly expected when there is conducive macroeconomic environment, and vice versa. Based on the above facts the author anticipated a positive/negative strong relationship between GDP and bank's profitability.

- **Inflation**

Ahmad et al., (2016) noted that the positivity or negativity of the relationship between inflation and bank performance depend on whether bank anticipates upward inflation or the reverse respectively. Moreover, according to Valentina (2009), inflation affects bank profitability depends on whether future movements in inflation are fully anticipated, which, in turn, depends on the ability of firms to accurately forecast future movements in the relevant control variables. An inflation rate that is fully anticipated raises profits as banks can appropriately adjust interest rates in order to increase revenues, while an unexpected change could raise costs due to imperfect interest rate adjustment. Tamiru (2013) identified negative relationship between general rate of inflation and profitability, because of bank management may not be able to well anticipate the future rate of inflation or it may be happened unexpectedly. Based on the above argument, in this study a positive/negative relationship is expected, as it depends on the banks management forecasting ability about future inflation movement.

Table 2 Description of Variables with expected relation

	Definition	Notation	Expected Result		
Dependent Variables					
Average Return on Asset	The ratio of net profit to total asset	AROA	-		
Average Return on Equity	The ratio of net profit to total Equity	AROE	-		
Return on Risk Weighted Assets	Capital to risk weighted assets	RORWA	-		
Independent Variables			AROA	AROE	RORWA
Capital Adequacy	Capital to Risk Weighted Asset	CAR	Negative	Negative	Positive
Asset quality	Loan loss provision to total loan ratio	NPL	Negative	Negative	Negative
Management Efficiency	Operating expense to Operating Income	OC_OI	Negative	Negative	Negative
	Non-Interest Income to total income	NII_TI	Positive	Positive	Positive
liquidity ratios	Liquid assets to short term liabilities	LA_DP	Negative	Negative	Negative
Earning	Net interest income to earning assets	NIM	Positive	Positive	Positive
Bank Size	Logarithm of total assets of the bank	LNBS	Positive	Positive	Positive
GDP Growth rate	growth rate of real gross domestic product	RGDP	Positive	Positive	Positive
Inflation	Annual growth rate of inflation	INF	Positive	Positive	Positive

3.7 Model specification

Gujarati (2004) mentioned that regression analysis technique is used for forecasting and finding the causal effect relationship between the variables. Similarly, Brooks (2008) noted that regression is concerned with describing and evaluating the relationship between a given variable

and one or more other variables; more specifically, regression is an attempt to explain movements in a variable by reference to movements in one or more other variables. Accordingly, in order to meet the aim of the study, the researcher used multiple linear regression method of Ordinary Least Square (OLS) model. There are sixteen cross-sectional units and six time serious periods in the study. Therefore, there are 96 observations. Moreover, as each cross-sectional unit has equal time serious observation period, balanced panel method is applied. In order to distinguish whether the regression model is fixed effect or random effect model, according to Gujarati (2004), the selection can be made by looking the difference between the number of time serious data and the number of cross-sectional units. If the former is larger than the latter, there is the possibility of applying fixed effect model, and vice versa. Based on this, as the number of cross-sectional data, i.e., 16 commercial banks, is larger than the number of time serious data, i.e. 6 years, random effect model seems preferable. REM is applied if and only if the Hausman test reflects the same result, otherwise FEM will be applied.

According to Gujarati (2004), while using the Hausman test, there are two hypothesizes, the null hypothesis – random effect model is appropriate, and alternative hypothesis – fixed effect model is appropriate. Based on the outcomes of the test, reject the null hypothesis if the prob-value is statically significant at 5% level and will use fixed effect model. Otherwise, use random effect estimator. P-Value measures the strength of the evidence against the null hypothesis.

The model adopted for this study is taken from the study of Artor (2017), Moges (2017), Elshaday et.al, (2018), which studied determinants of commercial banks profitability.

$$y_{it} = \beta_0 + \beta x_{it} + u_{it} \text{----- Equation 1}$$

where y_{it} is the dependent variable, β_0 is the intercept term, β is a $k \times 1$ vector of parameters to be estimated on the explanatory variables, and x_{it} is a $1 \times k$ vector of observations on the explanatory variables, $t = 1, \dots, 6$; $i = 1, \dots, 16$. Subscript i denote the cross-section and t representing the time-series dimension. Hence, based on the above equation, the general model that include all the variables in order to test the formulated hypothesis were:

$$y_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 OCOI_{it} + \beta_4 NIITI_{it} + \beta_5 LADP_{it} + \beta_6 NIM_{it} + \beta_7 BS_{it} + \beta_8 GDP_t + \beta_9 INF_t + u_{it} \text{----- Equation 2}$$

Where:

y_{it} is ROA, ROE and RORWA of i^{th} bank at year t .

CAR_{it} is the capital adequacy ratio of i^{th} bank at year t .

NPL_{it} is the nonperforming loan ratio of i^{th} bank at year t .

OC_OI_{it} is the operating cost to operating income ratio of i^{th} bank at year t .

NII_TI_{it} is non-interest income to total income ratio of i^{th} bank at year t .

$LADP_{it}$ is the liquidity position of i^{th} bank at year t .

NIM_{it} is net interest income to total earning assets ratio of i^{th} bank at year t .

$LNBS_{it}$ is the log form of asset size of bank i^{th} bank at year t .

GDP_t is the gross domestic product of country at year t .

INF_t is the inflation rate of country at year t .

u_{it} is error term where i is cross sectional and t is time identifier.

Accordingly, descriptive and regression results of the variables are presented in a tabular form on the next chapter, as generated from Eviews 9 software, and the required interpretation for the statistical results are given. Moreover, based on the Classical Linear Regression Model (CLRM) assumptions, the most widely used diagnostic tests, like normality, autocorrelation, multicollinearity and heteroscedasticity tests were conducted to attest the model used in the study fulfilled the required assumptions.

Chapter 4

DATA ANALYSIS AND DISCUSSION

Introduction

In this chapter the collected data was analyzed and interpreted in the following manners. Under section 4.1 descriptive statistics of the dependent and independent variables were presented, and correlation analysis followed under section 4.2. Section 4.3 presents the tests for the classical liner regression model/CLRM. Then, the diagnostic tests to choose between fixed or random effect models are presented under section 4.4. Discussions for the results of the regression analysis were made under section 4.5. Finally, conclusion and recommendation presented.

4.1 Descriptive Statistics

The descriptive statistics of nine independent and three dependent variables are presented below. In this study, AROA, AROE and RORWA are considered as dependent variables. While, CAR, Liquidity, Bank Size, Non-Interest Income, NIM, NPL, Operating Cost to Operating Income ratio, Inflation and RGDP are presented as independent variables.

Table 3 Summary of Descriptive Statistics for dependent and Independent Variables

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Obs
AROA	0.027770	0.028065	0.048412	0.005532	0.006327	96
AROE	0.195063	0.192038	0.377767	0.007370	0.054859	96
RORWA	0.030854	0.030905	0.048137	0.005114	0.008001	96
CAR	0.190826	0.181000	0.370524	0.084000	0.053348	96
LA_DP	0.309185	0.268282	1.531613	0.131696	0.185096	96
OC_OI	0.562234	0.555623	0.776462	0.386181	0.078240	96
NII_TI	0.358974	0.359654	0.649954	0.144093	0.108773	96
NIM	0.050639	0.051261	0.074742	0.021440	0.010391	96
NPL	0.026589	0.026700	0.055000	0.005100	0.010200	96
LNBS	9.271628	9.400848	11.22037	6.876677	0.980564	96
INF	0.097500	0.089000	0.137000	0.072000	0.024124	96
RGDP	0.090083	0.091500	0.104000	0.072500	0.012340	96

Source: Eviews 9 computed outcome

As shown on the above table the difference between mean and median of the variables are minimal. This is one of the indicators that the variables are normally distributed. The considered variables have positive mean, maximum and minimum values. From this we can conclude that

all private commercial banks reported profit during the period under review. Between the years from 2014 to 2019, the average value of AROA and AROE were 2.78% and 19.51%, respectively. This shows that from every 1-birr investment on asset and equity, private commercial banks in Ethiopia generated an average return of 2.78 cents and 19.51 cents profit, respectively. On the other hand, generated 3.08 cents profit from every 1-birr activity on risk weighted assets. The value of standard deviation, which shows the average amount of variability in a dataset, was 0.006, 0.054 and 0.008 for AROA, AROE and RORWA, respectively. This shows that the dispersion of AROA and RORWA between private commercial banks in Ethiopia is minimal. Whereas, the dispersion of AROE is a little bit more as compared to other dependent variables. The maximum and minimum value of AROA was 4.84% and 0.55%, which means commercial banks in Ethiopia generated the higher return of 4.84 cents and lower return of 0.55 cents profit from birr 1. Similarly, AROE and RORWA have a maximum value of 37.78% and 4.81%; and a minimum value of 0.74% and 0.51%, respectively.

Capital adequacy ratio, which measures the financial institutions capacity to absorb and meet their liabilities during financial crisis and protects from unexpected loss, has a mean value of 19.08% with minimum and maximum value of 8.4% and 37.05%, respectively. This indicates that all commercial banks met the minimum CAR requirement of the regulatory body in the reviewed period (8%); but some others hold more tied up capital, which might lead to negative relationship with profitability because of holding idler resource more than the optimal level or investing on less risky activities in order to meet the regulatory body requirement negatively affects the return. National Bank of Ethiopia, in line with the Basel Committee on Banking Supervision, enforced all commercial banks at least to maintain a capital ratio of 8% of the total risk weighted assets. The risk weighted assets includes both on and off balance sheet items. Moreover, their mean and maximum value revealed that more banks were in a position of adequate capital adequacy levels. The standard deviation of 0.053 indicates the existence of moderate deviation from the average value among commercial banks, as compared to other bank specific variables. The other important variable, Liquidity, which measures the commercial banks' ability to meet sudden cash withdrawal request by depositors, had an average value of 30.92% with standard deviation of 18.51%. Moreover, the liquidity ratio showed a minimum and maximum value of 13.17% and 153.16%. This indicates that the average value of commercial banks liquid assets covered 31% of their short term liabilities, which is customers deposit. But,

there are some banks operated under the minimum NBE requirements of 15% liquidity position. The SD value of 0.185 indicates the occurrence of moderate dispersion of values from their mean among private commercial banks in Ethiopia. The higher maximum value was registered by DGB in the year of its first year full operation after establishment in 2014. Holding higher liquidity position could be an indicator of not utilizing the available resources in an efficient manner to improve the banks performance.

The variable that is used to measure the management efficiency, lean low cost, has a mean value of 0.562 with SD of 0.078. In the period under review, the maximum and minimum operating cost to operating income ratio was 0.776 and 0.386, respectively. The higher ratio is an indicator of significant portion of the operational income dominated by operational cost that is negatively correlated with the bank's performance. The SD of 0.078 indicates the occurrence of moderate desperation among banks, as compared to other bank specific variables. The lower ratio is an indicator of the management efficiency in controlling their operational cost that lead to profitability. The other variable that was considered to look the contribution of non-interest income, which is highly dominated by the income generated from international trade and revaluation gain, on the bank's performance – non-interest income to total income – has an average value of 0.358 with maximum and minimum value of 0.65 and 0.144, respectively. Moreover, the SD of 0.108 indicates the appearance of moderate deviation from the mean among commercial banks. The mean value indicates 0.358 of the commercial banks total income was generated from non-intermediary business activities. The maximum value (65%) indicates significant portion of the commercial banks total income was extracted from service charges and commissions, which indicates the existence of positive effect on the commercial banks profitability.

NIM, which is an indicator of the net interest income generated from the banks earning assets, has an average value of 0.05 with SD of 0.01. This indicates that there was a minor deviation among a set of data from the mean. Moreover, it has a maximum and minimum value of 0.074 and 0.021, respectively. This shows that commercial banks in Ethiopia generate on average 0.051 cents net interest from 1 birr of earning assets. A bank that performs well generated a net interest of 0.074 birr, whereas that of underperformed earned 0.021. The higher spread is an

indicator of better income, and vice versa. Thus, a bank with stable and growing NIM is viewed more profitable, that leads to positive relationship with profitability.

The NPL, which measures quality of the bank's assets, is measured by the value of non-performing loans to total loan and advances. The higher ratio is an indicator of the existence of more provision that negatively affects the banks performance. As shown on the above table, the mean value of private commercial banks was 0.026 with maximum and minimum value of 0.055 and 0.005, respectively. This shows that commercial banks have managed properly their loan and advances. Moreover, almost all commercial banks were adhered the regulatory body maximum limit of 5% NPL ratio, except few registered a maximum value of 5.5%. The higher ratio is an indicator of the existence of higher risk that significantly affects the commercial banks profitability and going concern. The average mean value of 0.026, which is below by half from the regulatory body (5%) shows the existence of insignificant negative relationship with profitability. The standard deviation of 0.01 indicates the data serious is moderately dispersed. Bank size, which is represented by the natural logarithm of the value of commercial banks total assets, registered mean, maximum and minimum values of 9.27, 11.22 and 6.87, respectively. Their SD of 0.98 indicates the presence of higher variation among the data serious of private commercial banks. As larger banks will have the advantage of economic of scale, bank size expected to have a positive effect on the banks' performance.

Among the macroeconomic variables that presumed to have an impact on the commercial banks profitability was RGDP. For the last six years the Ethiopian economy was increased by an average value of 9%, with maximum and minimum value of 10.4% and 7.25%, respectively. This indicates that in the period under review the country's economic growth ranges between 10.4% and 7.25%. Moreover, the SD of 0.012 shows the existence of moderate unstable economic growth over the last six consecutive years. The possibility of positive turnover on the commercial banks operation highly expected when there is conducive macroeconomic environment, and vice versa. The maximum economic growth reflected in the year of 2015, whereas, the minimum in the year of 2018. The other variable, inflation, which is a measure of continuous rise of the price of goods and services, registered a mean value of 9.75% with SD of 0.024. The maximum and minimum values were 13.7% and 7.2%, which was registered in the year of 2019 and 2017, respectively. The SD and ranges between minimum and maximum values

indicate the existence of moderate deviation among serious of data of inflation. The registered lowest growth of RGDP and higher inflation may be associated with the government change that taken place in the year of 2018.

4.2 Correlation Analysis

The sign and value of a correlation is an indicator of the direction and strength between the two variables. According to Studenmund (2014), the range of correlation is between +1 to -1, and the sign of correlation indicates the direction of the correlation between the two variables. When the value of correlation coefficient equal to one, the variables are perfectly correlated. And, the variables are perfectly negatively correlated when the value of coefficient equal to -1. On the other hand, the value of coefficient equal to zero indicates the variables are not correlated.

Table 4 Compiled correlation matrix between dependent and independent variables

	CAR	INF	LA_DP	LNBS	NII_TI	NIM	NPL	OC_OI	RGDP
AROA	0.1567	-0.0244	-0.3060	-0.1092	0.3601	-0.0187	-0.1592	-0.8043	0.1068
AROE	-0.3849	0.1212	-0.4508	0.4105	-0.0214	0.1803	-0.0024	-0.5927	-0.0684
RORWA	0.5201	-0.0920	-0.1972	-0.1423	0.4063	-0.1820	-0.1034	-0.7308	0.1766

Source: Eviews 9 outcome

As shown on the above correlation matrix analysis table, the dependent variable (AROA) is positively correlated with NII_TI, CAR and RGDP. The positive correlation between AROA and NII_TI is statistically significant as compared to others, which is the income mainly generated from international banking trade and indicates commercial banks are generated significant portion of revenue from such activities during the analysis period. The result is significant at 1 percent level of significance. But, the positive correlation between AROA, CAR and RGDP were not statistically significant, as it close to zero. Hence, the changes on CAR and RGDP not lead to significant change on AROA. On the other hand, OC_OI, LA_DP, INF, LNBS, NIM, and NPL were negatively correlated with AROA. The correlation between AROA, OC_OI and LA_DP were statistically significant, which means moving up the ratio of theses variables would lead to decrease in AROA. It's believed that banks would enjoy higher return when they have a better cost management, as lower ratio suggests better cost control. Similarly, holding lower liquidity position could be an indicator of utilizing the available resources in an efficient manner to improve the banks performance. These indicate that OC_OI and LA_DP are the major determinants of commercial banks profitability as measured by AROA. Whereas, the relationship of NIM and INF with AROA were insignificant, which is close to zero.

RORWA, which measures the income generated from risk weighted assets, positively correlated with CAR, NII_TI and RGDP, the correlation with CAR and NII_TI were statistically significant. The positive correlation between RORWA and CAR is an indicator of either commercial banks are shifted their activities to lower risk investments or raised their capital in order to actively participate on risky investment to generate a better return. Thus, the value of RWA either declined or the income generated from risky activities soar. This in turn increases the commercial banks profitability measured by RORWA. Likewise, the positive correlation between RORWA and NII_TI indicates banks are generated significant portion of revenue from non-interest activities that is dominated by the international banking operations. The result is significant at the 1 percent level of significance. On the other hand, negative correlation registered between INF, LA_DP, LNBS, NIM, NPL and OC_OI with RORWA, the higher negative correlation existed with OC_OI. Banks would enjoy higher return when they have a better cost management, as lower ratio suggests better cost control. Meanwhile, the registered negative correlation with INF was not statistically significant, which is almost close to zero.

AROE is positively related with INF, LNBS and NIM. Of which, the correlation with LNBS is statistically significant. This is because, bigger banks have the chance to extend more loans and advances by using their available resources that would enable them to take the advantage of loan diversification opportunities that in turn boost their profitability. As same with AROA, a negative significant correlation existed between OC_OI and LA_DP with AROE. This significant relationship indicates moving up the ratio of theses variables would lead to decrease in AROE. This is because lower ratio suggests better cost control and utilizing the available resources in an efficient manner to improve the banks performance. A lower OC_OI ratio suggests better cost control. Inversely, holding higher liquidity position could be an indicator of not utilizing the available resources in an efficient manner. These indicate that OC_OI and LA_DP are the major determinants of commercial banks profitability. Moreover, the dependent variable negatively correlated with CAR, NII_TI, NPL and RGDP. Statistically insignificant negative correlation, which is close to zero, is existed between NII_TI, NPL and RGDP.

4.3 Testing the **Assumptions** of Classical linear regression model (CLRM)

In order to meet the aim of the study, the researcher used multiple linear regression method of Ordinary Least Square (OLS) model. To ensure the applied method fulfills the assumptions of CLRM and to be best estimator of the regression model, the below diagnostic tests were carried

out. According to Gujarati (2004) and Studenmund (2014), the Ordinary Least Square method becomes Best Linear Unbiased Estimators (BLUE) when it fulfills the CLRM assumptions. Moreover, model specification tests to select the model, between random and fixed effects, that best fit for the data was also carried out.

4.3.1 Test for homoscedasticity assumption

According to Gujarati (2004) and Brooks (2008), when there is homoscedasticity the error term appearing in the population regression function all have the same variance, which is one of the assumptions of CLRM. The problem of heteroscedasticity appears when the variance between the error term is not constant. The study was used Breusch-Pagan test in order to attest the presence of heteroscedasticity. The null hypothesis is the error term have constant variance and the alternative hypothesis is the error term don't have constant variance with 0.05 significance level. The null hypothesis is not rejected if the p-value is greater than 0.05. If not, the alternative hypothesis is accepted. Both F-statistic and Chi-square tests were used. As shown on the below table, the P-value of F-Statistic and Chi-square of the three dependent variables were above 0.05, indicates there is no evidence for the existence of heteroscedasticity. Hence, the null hypothesis failed to reject.

Table 5 Heteroskedasticity Test: Breusch-Pagan-Godfrey

AROA Heteroscedasticity test			
F-statistic	1.758527	Prob. F(9,86)	0.0881
Obs*R-squared	14.92110	Prob. Chi-Square(9)	0.0931
Scaled explained SS	13.60338	Prob. Chi-Square(9)	0.1371
AROE Heteroscedasticity test			
F-statistic	1.024851	Prob. F(9,86)	0.4270
Obs*R-squared	9.298860	Prob. Chi-Square(9)	0.4102
Scaled explained SS	9.279038	Prob. Chi-Square(9)	0.4119
RORWA Heteroscedasticity test			
F-statistic	1.213094	Prob. F(9,86)	0.2977
Obs*R-squared	10.81445	Prob. Chi-Square(9)	0.2886
Scaled explained SS	11.24251	Prob. Chi-Square(9)	0.2595

Source: Output of Eviews 9

4.3.2 Test for Autocorrelation

Studenmund (2014), serial correlation is the violation of Classical Assumption that different observations of the error term are uncorrelated with each other. In order to test the existence of

auto-correction in the regression model, two tests were carried out, the Durbin-Watson d test and Breusch–Godfrey serial correlation LM test. According to Gujarati (2004), the Durbin-Watson test of statistics varies between 0 and 4. If there is no serial correlation, the value indicates 2. A value less than 2 shows there is a positive correlation and greater than 2 depicts a negative correlation. But, the method has difficulties to judge the presence of autocorrelation if the value lies in the inconclusive region in both directions. If the DW test result falls in the inclusive region, the null hypothesis of no autocorrelation can neither be rejected nor not rejected, (Brooks, 2008).

Table 6 Autocorrelation test: Durbin Watson test

Variables	Durbin Watson test result
AROA	1.644107
AROE	1.540580
RORWA	1.796303

Source: Eviews 9 computed result

As per the DW table for 96 observations with 9 explanatory variables at 5% level of significance, it approaches to 95 observations, the dL and dU values are 1.46 and 1.87 respectively. The Durbin-Watson test of statistics value for AROA, AROE and RORWA was 1.644, 1.54 and 1.79, respectively. The DW values of AROA, AROE and RORWA lies in the inclusive region, as a result the H_0 of no autocorrelation neither rejected nor not rejected. Hence, it's difficult to interpret and decide whether autocorrelation is existed or not in the area of inclusive.

Studenmund (2014) explained that DW measures only first-order serial correlation, in which the current value of the error term is a function of the previous value of the error term. Thus, DW is failed to detect the occurrence of higher degree autocorrelation. In order to overcome the DW shortcomings, additional test called Breusch–Godfrey serial correlation LM test was applied.

Table 7 Autocorrelation test: Breusch-Godfrey Serial Correlation LM Test

AROE			
F-statistic	2.609737	Prob. F(2,84)	0.0795
Obs*R-squared	5.616145	Prob. Chi-Square(2)	0.0603
AROA			
F-statistic	1.500760	Prob. F(2,84)	0.2289
Obs*R-squared	3.311963	Prob. Chi-Square(2)	0.1909
RORWA			
F-statistic	1.766896	Prob. F(2,84)	0.1772

Obs*R-squared	3.875577	Prob. Chi-Square(2)	0.1440
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Source: Eviews 9 computed result (H_0 = There is no autocorrelation; and H_1 = There is autocorrelation with significance level of 5%)

Based on the 5% significance level, the p-value of LM tests, F-statistics and Chi-square, were significantly higher than 0.05. Therefore, this indicates that autocorrelation is not the problem of this study. Thus, the null hypothesis failed to rejected.

4.3.3 Test for Normality

Normality is one of the CLRM assumptions that requires disturbances that are not explained by the independent variables should follow the normal distributions. According to Gujarati (2004), for a normal distribution skewness and kurtosis need to have a value of 0 and 3, respectively, and the histogram will have a ‘bell-shaped’ model. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution are (Brooks 2008). In this study a Bera-Jarque test was applied in order to attest the existence of normality. The null hypothesis assumed residual is normally distributed, and the alternative hypothesis – residual is not normally distributed with 5% significance level. Jarque-Bera’s p-value greater than 0.05, the null hypothesis could not be rejected. As shown on the below table, the skewness and kurtosis of the equations not far from zero and three, and the histogram is bell-shaped. Moreover, Jarque-Bera’s p-value of each of the model significantly more than 5%, hence failed to reject the null hypothesis. Therefore, the disturbances that are not explained by the independent variables are normal distributed.

Table 8 Summary of Jarque-Bera normality test

	AROA	AROE	RORWA
Skewness	0.010	0.317	0.070
Kurtosis	3.297	3.480	3.590
Jarque-Bera	0.297	2.558	1.476
Probability	0.861	0.278	0.478

Source: Eviews computed outcome

4.3.4 Test of Multicollinearity

One of the assumptions of classical linear regression model is there must not be a multicollinearity among the explanatory variables. Multicollinearity can be perfect multicollinearity and near multicollinearity. According to Studenmund (2014) perfect

multicollinearity is the violation of Classical Assumption that no independent variable is a perfect linear function of one or more other independent variables, as the occurrence of multicollinearity makes it difficult to distinguish the effects of one variable from the effects of the other. The appearance of multicollinearity in the model increases the value of standard error that highly affects the t-score, as t-score is the result of coefficient value divided by the standard error (Studemund, 2014). In order to attest the existence of multicollinearity both correlation matrix and Variance Inflation Factor (VIF) are employed. According to Gujarati (2004), VIF shows how the variance of an estimator is inflated by the presence of multi-collinearity. Moreover, VIF of a variable exceeds 10, indicates the existence of multicollinearity in the model. Hence, multicollinearity is not the problem for this data, as below 4.

Table 9 Summary of VIF of the independent variables.

Variable	Centered VIF	1/VIF
RGDP	2.3	0.43
OC_OI	1.33	0.75
NPL_RATIO	1.27	0.79
NIM	1.67	0.60
NII_TI	3.43	0.29
LNBS	3.25	0.31
LA_DP	1.87	0.53
INF	2.49	0.40
CAR_RATIO	1.89	0.53
Mean VIF	2.17	

Source: Own computation through evIEWS 9

The alternative testing mechanism of multicollinearity is correlation matrix. The test was conducted by reviewing the value between the coefficients whether their values exceed 0.80 or not, as the value of correlation coefficient exceeds 0.80 could be considered as an indicator for the presence of multicollinearity among variables (Studenmund, 2014).

Table 10 Summary of Correlation Matrix of Explanatory Variables

	RGDP	OC_OI	NPL	NIM	NII_TI	LNBS	LA_DP	INF	CAR
RGDP	1								
OC_OI	-0.1539	1							
NPL	-0.0765	0.0979	1						
NIM	-0.2900	0.1892	0.2184	1					
NII_TI	0.3923	-0.2442	-0.1253	-0.5478	1				
LNBS	-0.3304	0.0011	0.1100	0.3580	-0.7524	1			
LA_DP	0.1701	0.2111	0.2679	-0.1607	0.4378	-0.5493	1		
INF	-0.7401	0.0764	0.1518	0.3018	-0.4507	0.4004	-0.2349	1	

CAR	0.2316	-0.2197	-0.1146	-0.4975	0.5763	-0.5835	0.3085	-0.2189	1
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Source: Eviews 9 computed outcome

The outcome of the above correlation matrix indicates that the maximum correlation of 0.5763 and -0.7524 were encountered between NII_TI and CAR, and LNBS and NII_TI, respectively. As a cutoff point, correlation above 0.8 is an indicator of occurrence of multicollinearity (Studenmund, 2014). But, as shown on the table, all correlation coefficients were below 0.8, which is an indicator of nonexistence of multicollinearity problem among the regressors considered in this study.

4.4 Model selection Criteria between Random Effect (RE) and Fixed Effect (FE)

The outcome result of the above applied various tests confirmed the assumptions of CLRM are not violated. As a result, OLS was found BLUE. According to various studies, panel data is explained by two major estimators, random effects model and fixed effects model. As explained by Brooks (2008), fixed effects models allow the intercept in the regression model to differ cross-sectionally but not over time, while all of the slope estimates are fixed both cross-sectionally and over time. As with fixed effects, the random effects approach proposes different intercept terms for each entity and again these intercepts are constant over time, with the relationships between the explanatory and explained variables assumed to be the same both cross-sectionally and temporally - the intercepts for each cross-sectional unit are assumed to arise from a common intercept α , which is the same for all cross-sectional units and over time (Brooks 2008).

Distinguishing either of the two methods is the major concern while applying panel data approach. As explained by Gujarati (2004), in order to get a formal answer for selection of the method, the researcher has employed the Hausman test. The null hypothesis for this test was random effect model is appropriate, and alternative hypothesis is fixed effect model appropriate. Based on the outcomes of the test, reject the null hypothesis if the prob-value is statically significant at 5% level and will use fixed effect model. Otherwise, use random effect estimator. P-Value measures the strength of the evidence against the null hypothesis.

Table 11 Summary of choosing between RE and FE model using Hausman test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

AROA

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.259534	9	0.4137

AROE

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	15.396202	9	0.0806

RORWA

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.693134	9	0.8602

Source: The researcher computation through Eviews 9

As shown on the above table, Hausman specification test p-values of the models are 0.4137, 0.0806 and 0.8602 for AROA, AROE and RORWA, respectively, which are significantly more than 5% of the significance level. As a result, the null hypothesis of the model could not be rejected. This implying that random effect model is the more suitable model than fixed effect model for this study.

4.5 Result of the Regression Analysis

This section presents the outputs of the regression analysis of three dependent and nine independent variables in order to determine the factors that affect the banks' profitability. In this study AROA (net income to total average assets), AROE (net income to total average capital) and RORWA (net income to risk weighted assets) were employed as measurement of bank's profitability.

As shown on the below regression outputs, the β_0 (intercept of constant term) may be positive or negative, which indicates the expected value of the dependent variable when all other independent variables, including the error term, equal zero (Studenmund, 2014). Similarly, the beta coefficients (slopes) could have a positive or negative sign, which indicates the relationship they have with the dependent variable. A positive sign is an indicator of increasing of the dependent variable when the independent variable increases. For negative sign, the dependent

variable increases when the independent variable decreased. The slope coefficient measures the impact of a one percent increases on the regressor on the profitability of commercial banks, other thing being constant. The t-test is an indicator of the value of the regression coefficient significance or non-significance from zero, the larger t-value the greater the likelihood that the estimated regression coefficient is significantly different from zero (Studenmund, 2014). P-value is an alternative approach to the t-test, which indicates the marginal level of significance at which the null hypothesis could be rejected (Brooks 2008). As p-value is a probability, runs from 0 to 1.

According to Studenmund (2014), there is no rule of thumb to determine how high is the value of R^2 (measure of goodness of fit) must be for the fit to be considered satisfactory. The output of R^2 ranges from 0 to 1, a value of R^2 close to one shows an excellent overall fit, whereas near zero indicates a failure of the estimated regression equation to explain the values of dependent. The main cons of using R^2 as measurement of goodness of fit of the independent variables is that consideration of any additional independent variable in the equation could increase the value of R^2 , (Brooks 2008). In order to curb this problem adjusted R-square is proposed. Based on the improvement of inclusion of a variable on the equation, the adjusted R^2 will increase, decrease or left as it is (Brooks 2008). On the other hand, F-test measures the overall fitness of the regression model. According to Gujarati (2004), the null hypothesis could be rejected if the F-value is greater than the critical value.

4.5.1 Random effect Regression analysis of AROA, AROE and RORWA

Based on the regression analysis outputs of AROA, AROE and RORWA, the operational panel regression models used to determine the private commercial banks profitability were provided as follows:

$$AROA = 0.037 - 0.014 CAR - 0.024 NPL - 0.054 OCOI + 0.033 NIITI - 0.010 LADP + 0.168 NIM + 0.0001 BS + 0.019 RGDP + 0.035 INF$$

$$AROE = 0.085 - 0.386 CAR - 0.013 NPL - 0.365 OCOI + 0.342 NIITI - 0.063 LADP + 0.996 NIM + 0.025 BS - 0.157 RGDP + 0.162 INF$$

$$RORWA = 0.003 + 0.081 CAR - 0.0004 NPL - 0.050 OCOI + 0.031 NIITI - 0.011 LADP + 0.205 NIM + 0.001 BS + 0.031 RGDP + 0.017 INF$$

As shown on the random effect regression analysis (annexed), 84.5% of AROA, 75.5% of AROE and 75.7% of RORWA are explained by the independent variables considered in this study, as measured by adjusted R-square. The output of R^2 ranges from 0 to 1, value close to one shows an excellent overall fit, whereas near zero indicates a failure of the estimated regression equation to explain the values of dependent. Thus, explanatory power of the above models is high, as their adjusted R^2 result approaches to 1. The rest 15.5%, 24.5% and 24.3% of the dependent variables are explained by the independent variables that are not considered in these models.

Among the considered nine bank specific and macroeconomic independent variables, six variables had statistically significant impact and considered to be as the major determinants of private commercial banks profitability, as measured by AROA. The variables are operating cost to operating income, net interest margin, non-interest income to total income, liquidity, inflation rate and capital adequacy ratio were statistically significant at 1%, 5% and 10% levels. The remaining three variables, non-performing loan, bank size and RGDP, were statistically insignificant. Similarly, from the considered nine variables to explain AROE, six variables, operating cost to operating income, net interest margin, non-interest income to total income, bank size, liquidity and capital adequacy ratio were statistically significant at 1%, 5% and 10% levels of significance. The same outcomes also occurred on RORWA, except the variables appear statistically significant at 1%, and 5% levels of significance. The remaining three variables, non-performing loan, Inflation and RGDP, were statistically insignificant, which means these variables are not determinants of commercial banks profitability as measured by AROE and RORWA. Non-performing loan and RGDP commonly have insignificant impact on the commercial banks performance as measured by the three dependent variables, AROA, AROE and RORWA.

The F-statistics of the models, which measures overall fitness of the regression models, has p-value of 0.0000. This shows that the regression models fit the data at 1% significance level.

The coefficients sign of operating cost to operating income, non-performing loan, liquidity ratio and capital adequacy ratio were negative with AROA and AROE, this indicates the existence of inverse relationship between dependent and independent variables. On the other hand, positive relationship noted with the rest of five regressors, which implies the increasing of these variables would value added on the profitability of commercial banks. Similarly, the coefficients sign of

operating cost to operating income, non-performing loan, and liquidity ratio with RORWA were negative. This indicates the existence of inverse relationship between RORWA with those three independent variables. On the other hand, positive relationship noted with the rest of six independent variables.

4.5.1.1 Discussion of the Regression Results

In this section the effect of each of the independent variable on the private commercial banks profitability, as measured by AROA, AROE and RORWA, is discussed. The outcome of the regression was also analyzed with the predicted hypothesis and previous literatures.

Capital Adequacy Ratio (CAR)

The ratio measures the financial institutions capacity to absorb and meet their liabilities during financial crisis and protects from unexpected loss and failure. According to the result of random effect regression analysis, CAR is inversely related with AROA and AROE. The negative impact of CAR is statistically significant at 10% level on AROA and 1% on AROE. The output result is consistent with the hypothesis predicted in this study. The negative sign implies that a one percent change in CAR resulted 0.014 unit change on the banks profitability, as measured by AROA, and 0.386 units change as measured by AROE. The higher ratio could be an indicator of commercial banks shifted their activities to lower risk investment or holding idle resources; and such their activities inversely affects the return. Contrary to the regression analysis of AROA and AROE, CAR is positively related with RORWA. The positive impact of CAR on the commercial banks profitability is statistically significant at 1% level. The output result is consistent with the hypothesis predicted in this study. The positive sign implies that a one unit change in CAR resulted 0.081 units change on the banks profitability, as measured by RORWA. The situations that expected to have negative effect on AROA and AROE will have a positive contribution to RORWA; higher CAR is an indicator of commercial banks either shifted their activities to lower risk investments or raised their capital in order to actively participate on risky investment to generate a better return. Thus, the value of RWA either declined or the income generated from risky activities soar. This in turn increases the commercial banks profitability as measured by RORWA.

The outcomes of AROA and AROE coincided with the studies conducted by Berger and Bouwman (2011), and Artor (2017), they have identified that in order to have a higher capital

adequacy ratios banks shift their investment to safer assets, which may affect bank performance. On the other hand, Million et.al (2015), mentioned that holding capital beyond the optimal level would inversely affect the efficiency and profitability of commercial banks. Both of the cases are the sources of negative relationship with profitability, as the former causes reduction of profitability and the later brought costs due to not utilizing the available resources. The positive outcome of RORWA is also in line with the studies conducted by Brahmana et.al (2018), Ahmad (2016) and Prajapati (2019). Risk bearing capacity of the bank strengthens when capital increases, as large banks take riskier investments resulting higher return, or diverting their investments to lower risk activities, in turn reduces the value of RWA.

But, the negative outcomes of AROA and AROE are not agreed with the studies conducted by Boru (2014), Elshaday (2013), Tewodros and Gedion (2019), Bekalu and Abel (2017) and Tadese and Enyew (2019) on a sample of commercial banks in Ethiopia focusing on old and middle aged banks. For this inclusion of early established banks in this study would play vital role, as early established banks registered a higher capital adequacy ratio compared to old and middle aged banks during the period under review. The average mean value of early established banks was 22%, which is more by 6 percentage points from the old aged banks, 16%. Hence, the outcome of higher ratio is highly correlated with giving more focus on less risky investments or holding capital beyond the optimal level by early established banks, in turn negatively affects the profitability of private commercial banks.

Nonperforming loan ratio (NPL)

The proxy measure of credit risk, nonperforming loan ratio, was negatively related with profitability of the bank as measured by AROA, AROE and RORWA, which is in line with the initial priority assumptions. The negative sign indicates that NPL was inversely related with profitability. When NPL increases the bank's profitability decreased, and vice versa. One unit change of NPL brought an impact of 0.024, 0.013 and 0.0004 unit of loss on the banks profitability as measured by AROA, AROE and RORWA, respectively. The insignificant impact of NPL indicates the banks' ability to minimize the credit risk through their analysis, internal process and follow-up. As shown on the descriptive analysis, the average NPL ratio of private commercial banks was almost below by half from the regulatory body requirement. Moreover, considering collateral as a major criterion by private commercial banks and close supervision of

the regulatory body could have their own impact in reducing the default rate. As a result, the probability of borrowers' default is minimal.

This negative relationship with profitability is consistent with the previous studies of Boru (2014), Elshadey (2017), Azeem et.al (2017), Dang (2011), Nicolae et.al; (2015), Million et.al (2015), Delis (2005), Brahmana et.al (2018) and Ahmad (2016). Deteriorating of the asset quality increases the amount of provision expense held for the defaulted loans, which in turn decrease the interest income that affects the performance of commercial banks.

Operating Cost to Operating Income (OC_OI)

The most widely used management efficiency measurement ratio of operating cost to operating income negatively related with the banks performance. It's believed that banks would enjoy higher return when they have a better cost management, as lower ratio suggests better cost control. The negative sign indicates the existence of inverse relationship between OC_OI and the dependent variables. When OC_OI changed by one unit, banks profitability dwindled by 0.054 unit – AROA, 0.365 unit – in case of AROE and 0.050 unit in case of RORWA, assuming other thing being constant. The negative relations were statistically significant at 1% level. The p-value 0.0000 shows OC_OI is one of the banks independent variable that highly determine the bank's profitability. High operating cost to operating income ratio is an indicator of banks are not managing in an efficient manner or the presence of too much competition in the banking industry. As a rule of thumb, the ratio is advised not to be more than 60%. In this regard, the average mean value of Ethiopian private banks OC_OI ratio was 56%, which indicates that commercial banks are managing well their operational cost in order to generate a better income.

This negative relationship with profitability is consistent with the previous studies of Tewodros and Gedion (2019), Akbas, (2012), Marshal (2013), Artor (2017), Elshadey (2017), Delis (2005), Ahmad (2016) and Brahmana et.al (2018). The higher the ratio of OC_OI considered as an indicator of weak management efficiency in controlling operational related expenses, which lower the bank profitability.

Non-Interest Income to Total Income (NII_TI)

The other bank specific independent variable, NII_TI was positively correlated with the bank's profitability at 1% significance level, as measured by AROA, AROE and RORWA. This ratio measures the banks' ability in diversifying their income. As the name implies all incomes other

than interest considered as numerator in the computation of the ratio. The positive sign indicates the occurrence of direct relationship between NII_TI and bank profitability. which mainly a measure of income from foreign operations. When non-interest income ratio increased by one unit, profitability soar by 0.033, 0.342 and 0.031 units, as measured by AROA, AROE and RORWA, respectively. The result is in line with the predicted hypothesis.

As shown on the descriptive analysis part, the Ethiopian private commercial banks were generated on average 36% of their total income from non-interest bearing activities. There were also events some of commercial banks earned more than 50% of their income from service charge and commissions. The above average 36% income coverage registered in the situation wherein the country has been in severe foreign currency crunch, as significant portion of this income emanated from international trade. This indicates that, when the existing foreign currency problem solved, commercial banks will earn significant portion of their revenue from non-interest income.

The above positive relationship is also in line with the previous studies of Boru (2014), Fadzlan Sufian (2008), Som Raj (2017), Beakal and Abel (2017), Waqas et.al, (2014), Prajapati (2019), and Ahmad (2016). Financial institutions derived a higher proportion of their income from non-interest sources, such as fee-based services.

Liquid assets to short term liabilities (LA_DP)

The liquidity ratio was measured by liquid assets to short term liability. Liquidity position is negatively related with the bank's profitability as measured by AROA, AROE and RORWA. The higher of the liquidity ratio would increase the banks strength in resisting the financial shocks that affect the day-to-day operations. Inversely, holding higher liquidity position could be an indicator of not utilizing the available resources in an efficient manner to improve the banks performance. The variable's p-value of 0.0001 indicates the effect of liquidity was statistically significant at 1% level, and the coefficient negative sign indicates the liquidity position negatively influence the banks' profitability. This indicates that liquidity management is one of the predominant bank specific variables that determine their profitability. The result is in line with the prior predicted hypothesis. During the period under review, the average mean of the private commercial banks liquidity position was twofold of the regulatory body requirement,

which indicates that they have been more liquid, and in turn negatively affect the banks' performance.

The result is also in line with the literatures of Artor et.al (2017), Berger and Bowman, (2009) and Beakal and Abel (2017). Liquidity reserves imposed by law become a burden for banks and result in negative relationship. Moreover, holding more liquid assets without investing on less risky activities, like treasury bills, leads to more reduction on profitability. On the other hand, focusing on less risky investment may also leads to reduction on profitability because of its minimum return as compared to other activities, like intermediary business. In Ethiopia context, maintaining at least 15% of deposit in the form of liquid assets is the regulatory body requirement.

But, the above outcomes inversely related with the studies of Boru (2014), Tewodros and Gedion (2019) and Tadese and Enyew (2019) conducted on a sample of commercial banks in Ethiopia focusing on old and middle aged banks. The different outcome may be as a result of contemplation of early established banks in this study, as they registered a higher liquidity ratio compared to old and middle aged banks in the period under review. The average mean value of early established banks was 36%, which is more by 13 percentage points from the old aged banks, 23%, and three-fold of the regulatory body minimum reserve requirement. Hence, the outcome of higher ratio is highly correlated with giving more focus on less risky investments or holding resource beyond the optimal level by early established banks, in turn negatively affects the profitability of private commercial banks.

Net Interest Margin (NIM)

The ratio of net interest income to total earning assets is positively related with profitability of private commercial banks measured by AROA, AROE and RORWA. The p-value indicates the effect of NIM statistically significant at 1% level, and the coefficient's positive sign indicates NIM positively influenced profitability, as measured by all the dependent variables. This variable measures the interest spread between the interest income from total earning assets and the interest expense on interest-bearing sources of funds. The mean average rate of private commercial banks NIM is 5.06%, which indicates that during the period under review commercial banks earned an average net interest income of 0.056 birr from birr 1 investment on earning assets. The above outcome is in line with the hypothesis predicted in this study. This

shows that commercial banks earned significant portion of revenue from interest income as compared to other non-interest incomes.

The result is also agreed with the studies conducted by Elsiefy (2013) and Goyal et al., (2016). Bank's primary intermediation functions is to raise liabilities (deposit) and use the proceeds to purchase income earnings assets. Thus, a bank with stable and growing NIM is viewed more profitable.

Bank Size (BS)

Bank size, measured by logarithm of total assets, has positive relationship with profitability. The influence of BS was not statistically significant even at 10% significance level, with coefficient value of close to zero. The p-value was 0.8457. It was presumed that larger banks would able to take the advantage of loan diversification opportunities and charging higher rates, that in turn boost their profitability. The above outcome indicates bank size has positive relationship with profitability with insignificant effect as measured by AROA. On the other hand, the influence of BS was statistically significant at 1% significance level as measured by AROE and 5% with RORWA. The above outcome in line with the hypothesis predicted in this study and the variable strongly determine banks profitability. This is because of large banks would extend more loan and advances and involve in riskier activities, that will increase their profitability. Moreover, higher deposit increases the ratio of financial leverage, which in turn increases ROE.

This positive relationship with profitability is consistent with the previous studies of Elshadey (2017), Waqas et.al, (2014), Brahmana et.al (2018), Ahmad (2016), Moges (2017) and Beakal and Abel (2017). Bigger banks extend more loans and advances to their customer and earns more income. In addition, large banks in large market take riskier investments resulting higher return.

Real GDP growth and Financial Performance

RGDP is one of the macroeconomic variable used in this study to measure the impact of economic condition on the commercial banks profitability. RGDP is positively correlated with the profitability measured by AROA and RORWA. The p-value (0.5081 and 0.4916) indicates that the impact of RGDP is not statistically significant to determine the private commercial banks profitability, even at 10% level, which shows that RGDP doesn't influence private commercial banks profitability. The result is in line with the hypothesis predicted in this study, except its

insignificance effect. The positive relationship indicates that when there is a good macroeconomic environment the banks operational activities, especially resource mobilization and the asset qualities, shows improvement, that in turn increases profitability, and vice versa. But, the RGDP impact was not significant because of commercial banks insignificant contribution to the country's economic growth.

RGDP was negatively correlated with AROE. The p-value of 0.157 indicates that the impact of RGDP is not statistically significant to determine the private commercial banks profitability, even at 10% level. It was expected the possibility of positive turnover on the commercial banks operation. This might be due to the challenges to raise the banks capital within the planned period for further investment activities, as shareholders preferred to partake on other area of activities that will have a better return.

The above positive relationship is consistent with the previous studies of Azeem et.al (2017), Abdissa (2016), Boru (2014), Athanasoglou (2005), Chinoda 2014 and Moges (2017). According to those studies, the possibility of positive turnover on the commercial banks operation highly expected when there is conducive macroeconomic environment, and vice versa. When the country's GDP slows down the banks operational activities, especially the asset quality, deteriorated due to decline in production, lack of investment, less export, unemployment and inflation increases. Thus, the level of NPL will increase that negatively affect bank's profitability. The previous studies of Tamiru (2013) and William (2012) agreed with the above negative relationship with profitability measured by AROE. RGDP expected to influence various activities of commercial banks related with loan and deposit. When the country's economic condition is in a good status, it will affect positively, if not it would affect negatively.

Contrary to the identified significant impact of the economic growth on the banks profitability in the previous studies, this study result indicates the impact of RGDP is insignificant, even at 10% level. This might be the share of financial intermediation of commercial banks in the GDP is still in an infant stage. According to MOFED recent report (2019/20), the commercial banks share of contribution to the country's GDP is only 3.3%. This indicates the commercial banks detachment and insignificant contribution to the country's economic growth.

Inflation and Financial Performance

Inflation, one of the other macroeconomic factors, is positively correlated with profitability, as measured by AROA, AROE and RORWA. Its statistical significance level was 5% on AROA. But, not statistically significant even at 10% level on AROE and RORWA. The impact of inflation on profitability could be positive/negative, as it depends on the bank's management anticipation about the future trend. Same also reflected on the prior hypothesis. An inflation rate that fully anticipated raises profits as banks can appropriately adjust lending interest rates in order to increase revenues, and vice versa. But, such thing is not clearly noticed in Ethiopia context. This may be due to imposition of higher lending rate by commercial banks.

The above positive relationship agreed with the previous studies of Boru (2014), Athanasoglo (2005), Moges (2017), Delis (2005) and Marshal (2013). The annual rate of inflation is found to have positive relationship with profitability. Inflation exerts upwards pressure on lending rates which forces commercial banks to increase their base lending rates in order to offset the imbalances in their earnings and as a result experience profitability.

Chapter Five

Summary of major findings, Conclusion and Recommendation

5.1 Summary of major findings and conclusion

The main objective of this study is to determine the factors that affect the private commercial banks' profitability in Ethiopia. Based on this general objective, the factors that assumed to have an influence on profitability have been separated in two groups as bank-specific and macroeconomic variables. Risk neutral and risk adjusted performance measurements were also employed to attest the independent variables that behave differently with risk adjusted return. All private commercial banks operating in the country were considered. Nine variables which believed to have an influence on the financial performances of commercial banks were analyzed. Balanced Panel data of 16 commercial banks from 2014 to 2019 was used. Data was presented by using descriptive statistics. Multiple linear regression method of Ordinary Least Square (OLS) model was used to analyze the private commercial banks' financial performance. Before applying the OLS regression, the models were tested for the fulfillment of the assumptions of CLRM. The models have fulfilled all the assumptions and became BLUE. Based on the outcome of the Hausman test, Random effect model/REM was used.

From the total nine independent variables, six variables have statistically significant impact on the private commercial banks' profitability measured by AROA, AROE, and RORWA. Among six statistically significant variables five of them simultaneously determine commercial banks' profitability, namely cost to operating income, net interest margin, non-interest income to total income, liquidity, and capital adequacy ratio. The remaining variables, Bank size significantly determine profitability measured by AROE and RORWA, whereas, inflation significantly influences profitability measured by AROA. The remaining three variables, non-performing loan, bank size and RGDP with AROA; and non-performing loan, Inflation and RGDP with AROE and RORWA, were statistically insignificant. Similarly, three independent variable coefficients were negatively correlated with the dependent variables, operating cost to operating income, non-performing loan and liquidity ratio are negatively related with the three dependent variables simultaneously. Whereas, capital adequacy ratio is negatively related only with AROA and AROE.

Liquidity ratio, measured by liquid assets to short term liabilities, is inversely related with the previously reviewed studies conducted by Boru (2014), Tewodros and Gedion (2019), and Tadese and Enyew (2019) on a sample of commercial banks in Ethiopia focusing on old and middle aged banks, identified positive relationship with profitability. This different outcome may be a result of the inclusion of early established banks in this study. In the period under review, early established banks have been registered higher liquidity ratios compared to old and middle aged banks. The mean value of early established banks was 36%, which was more by 11 percentage points from the middle and old aged banks mean value. Moreover, the industry's mean value (31%) indicates the occurrence of high liquidity, which was two times more than the minimum regulatory body requirement. Thus, holding of more liquid assets without investing at least in other less risky areas, or focusing on less risky investments may lead to a reduction on profitability because of its minimum return as compared to other activities, like an intermediary business.

The negative relationship of CAR with profitability identified in this study is not agreed with the previous studies held by Boru (2014), Elshaday (2013), Tewodros and Gedion (2019), Bekalu and Abel (2017), and Tadese and Enyew (2019) on a sample of commercial banks in Ethiopia focusing on old and middle aged banks. Similar to the NPL ratio, early established banks were registered a higher average capital adequacy ratio of 22% compared to old and middle aged banks. Moreover, the private banks' CAR mean values, 19%, were significantly higher than the regulatory body minimum requirements of 8%. This indicates that the industry has been held idle resource or giving more focus on less risky investments in the period under review. Holding capital beyond the optimal level would negatively affect the profitability of commercial banks. The result of other independent variables considered in this study agrees with the reviewed previous studies conducted on commercial banks in Ethiopia.

The results show that most of the considered independent variables behave similarly with the risk-neutral and risk adjusted performance measurements, except capital adequacy ratio. The inverse relationship of CAR with risk neutral performance measurements may be as a result of either commercial banks hold idler resources or shifting their activities to lower risk investments. Moreover, bank specific variables by large explain the variation in profitability. The private commercial banks' profitability highly determines by the banks' ability to control their overhead

expenses and interest spread, diversify their income sources by incorporating non-traditional banking services, and managing their liquidity and capital position without compromising the regulatory body rules. Moreover, this paper revealed that banks' credit risk is not significant to affect bank's performance.

5.2 Recommendation

- Attention should be given to digitization – Currently the growing trend of digitization changing the business structure of the banking system and plays vital role in controlling overhead costs. Hence, banks' management better to give attention in deploying advanced technologies that makes easy the internal process by reducing the overhead costs instead of focusing on costly activities, like branch expansion.
- Banks better to implement an adequate follow-up and management system on their liquidity position – as shown in this study liquidity is one of the predominant bank specific variables that affects profitability. Holding of idler fund or investing on less risky activities significantly affects the bank's profitability, as lower risk associates with lower return. On the other hand, investing the available liquid resources on long term activities expose to liquidity risk that affects the banks' going concern and reputation.
- Give due consideration to the macroeconomic factors – The study finds that the real GDP growth and inflation rates are not significantly influence the profitability of private commercial banks. Real GDP measures the economic growth of a country. On the other hand, inflation is a continuous increase of the price of a product and services, which ultimately affects the borrowers' loan repayment capacity, saving potential of the depositors and resource mobilization capacity of banks. Moreover, according to MOFED's recent report (2019/20), the share of financial intermediation to the country's GDP is only 3.3%. This indicates the commercial banks' detachment and insignificant contribution to the country's economic growth. Hence, commercial banks need to give the required attention to the macroeconomic variables in their strategic documents to respond to the dynamic economic environment.
- Attention should be given to the income diversification- The share of non-interest income, which is highly dominated by the service charges from foreign operation, is found to be one of the determinants of profitability of Ethiopian private Banks. Consequently, banks ought to

redirect their attention towards keeping up the right blend of non-interest-bearing resources which can create service charge earnings. Thus, by shifting from the traditional banking operations (focuses on intermediary business), Ethiopian banks need to engaged on fee based activities that are less exposed to credit risk to sustain their profitability by expanding their income bases.

- Attention should be given to overhead expense management – The impact of operational costs, measured by the operational cost to operational income, is found one of the factors that significantly affect the private commercial banks' profitability. The higher ratio of OC_OI is considered as an indicator of weak management efficiency in controlling operational related costs, which lowers the bank profitability. As shown on the above study, private commercial banks have registered an average rate of 56%, which indicates that they have incurred operational cost of 56 cents in order to generate 1-birr revenue. This seems a higher cost. Hence, banks need to implement strong controlling mechanisms on the overhead expenses in order to not affect their long-term profitability.

Directions for Further research

This study was conducted to identify the factors that determine the private commercial banks' profitability that rely on secondary sources. But, in expansion to the considered components, the Ethiopian banking industry appears profoundly subsidiary with ethnicity and religion. So, further in-depth research works that measure the impact of ethnicity and religion on the performance of commercial banks in Ethiopia is recommended for further research.

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Appendixes

Appendix I

Row data

Year	Banks	AROA	AROE	RORWA	CAR ratio	NPL ratio	NII_TI	OC_OI	lnBS	LA_DP	NIM	RGDP	INF
2014	Awash	0.033	0.265	0.041	0.172	0.028	0.366	0.427	10.004	0.336	0.049	0.103	0.081
2015	Awash	0.037	0.223	0.032	0.160	0.015	0.365	0.482	10.135	0.210	0.043	0.104	0.077
2016	Awash	0.026	0.209	0.031	0.215	0.020	0.319	0.517	10.346	0.254	0.051	0.078	0.097
2017	Awash	0.027	0.229	0.028	0.132	0.016	0.312	0.537	10.645	0.229	0.052	0.098	0.072
2018	Awash	0.031	0.294	0.028	0.120	0.019	0.223	0.500	10.920	0.268	0.057	0.073	0.121
2019	Awash	0.038	0.297	0.035	0.120	0.013	0.258	0.438	11.220	0.191	0.059	0.085	0.137
2014	Dashen	0.034	0.291	0.042	0.166	0.033	0.468	0.391	9.997	0.370	0.035	0.103	0.081
2015	Dashen	0.031	0.294	0.039	0.157	0.026	0.438	0.478	10.117	0.279	0.039	0.104	0.077
2016	Dashen	0.027	0.232	0.026	0.216	0.021	0.443	0.523	10.260	0.302	0.037	0.078	0.097
2017	Dashen	0.024	0.206	0.038	0.200	0.028	0.394	0.607	10.452	0.189	0.040	0.098	0.072
2018	Dashen	0.023	0.188	0.030	0.190	0.034	0.268	0.654	10.724	0.196	0.052	0.073	0.121
2019	Dashen	0.020	0.150	0.027	0.180	0.030	0.229	0.654	10.937	0.136	0.051	0.085	0.137
2014	Abyssinia	0.026	0.221	0.031	0.170	0.034	0.275	0.495	9.330	0.302	0.051	0.103	0.081
2015	Abyssinia	0.023	0.172	0.032	0.196	0.027	0.293	0.553	9.523	0.259	0.049	0.104	0.077
2016	Abyssinia	0.025	0.193	0.029	0.163	0.019	0.328	0.587	9.731	0.228	0.054	0.078	0.097
2017	Abyssinia	0.026	0.215	0.030	0.164	0.013	0.332	0.604	10.140	0.166	0.051	0.098	0.072
2018	Abyssinia	0.020	0.157	0.023	0.173	0.013	0.169	0.655	10.373	0.174	0.067	0.073	0.121
2019	Abyssinia	0.022	0.169	0.022	0.139	0.034	0.183	0.632	10.579	0.139	0.063	0.085	0.137
2014	Wegagen	0.028	0.153	0.035	0.301	0.021	0.382	0.523	9.353	0.213	0.047	0.103	0.081
2015	Wegagen	0.028	0.155	0.029	0.249	0.037	0.356	0.563	9.526	0.239	0.052	0.104	0.077
2016	Wegagen	0.025	0.144	0.032	0.219	0.017	0.332	0.596	9.692	0.280	0.052	0.078	0.097
2017	Wegagen	0.029	0.163	0.030	0.190	0.012	0.372	0.578	9.950	0.250	0.050	0.098	0.072
2018	Wegagen	0.033	0.221	0.036	0.210	0.037	0.315	0.550	10.218	0.197	0.063	0.073	0.121
2019	Wegagen	0.022	0.153	0.034	0.240	0.022	0.216	0.664	10.301	0.182	0.063	0.085	0.137
2014	United	0.025	0.200	0.035	0.198	0.017	0.312	0.525	9.382	0.380	0.045	0.103	0.081
2015	United	0.021	0.172	0.029	0.174	0.017	0.289	0.611	9.572	0.231	0.048	0.104	0.077
2016	United	0.021	0.180	0.024	0.150	0.017	0.267	0.627	9.757	0.224	0.051	0.078	0.097
2017	United	0.019	0.166	0.020	0.135	0.018	0.230	0.645	9.994	0.193	0.051	0.098	0.072
2018	United	0.023	0.210	0.025	0.131	0.019	0.216	0.622	10.241	0.196	0.056	0.073	0.121
2019	United	0.024	0.221	0.024	0.123	0.028	0.174	0.581	10.484	0.132	0.057	0.085	0.137
2014	NIB	0.032	0.173	0.038	0.236	0.031	0.332	0.488	9.282	0.242	0.056	0.103	0.081
2015	NIB	0.028	0.163	0.034	0.218	0.031	0.265	0.502	9.492	0.184	0.054	0.104	0.077
2017	NIB	0.028	0.189	0.028	0.160	0.029	0.230	0.519	9.953	0.200	0.057	0.098	0.072
2018	NIB	0.022	0.163	0.024	0.160	0.024	0.166	0.590	10.192	0.180	0.059	0.073	0.121
2019	NIB	0.024	0.185	0.025	0.150	0.044	0.144	0.564	10.426	0.142	0.060	0.085	0.137

2014	CBO	0.048	0.378	0.046	0.170	0.019	0.521	0.386	8.903	0.254	0.065	0.103	0.081
2015	CBO	0.033	0.230	0.031	0.140	0.029	0.428	0.489	9.347	0.318	0.064	0.104	0.077
2016	CBO	0.006	0.059	0.005	0.118	0.055	0.236	0.776	9.277	0.226	0.075	0.078	0.097
2017	CBO	0.012	0.152	0.015	0.098	0.050	0.268	0.707	9.783	0.269	0.055	0.098	0.072
2018	CBO	0.020	0.269	0.022	0.096	0.029	0.262	0.667	10.305	0.302	0.056	0.073	0.121
2019	CBO	0.018	0.232	0.017	0.084	0.034	0.242	0.703	10.640	0.200	0.055	0.085	0.137
2014	Lion	0.029	0.165	0.038	0.246	0.020	0.389	0.526	8.192	0.421	0.058	0.103	0.081
2015	Lion	0.038	0.274	0.037	0.150	0.029	0.488	0.481	8.676	0.344	0.048	0.104	0.077
2016	Lion	0.037	0.266	0.038	0.156	0.032	0.411	0.518	9.002	0.290	0.056	0.078	0.097
2017	Lion	0.028	0.203	0.032	0.170	0.034	0.268	0.562	9.303	0.304	0.056	0.098	0.072
2018	Lion	0.031	0.240	0.036	0.166	0.035	0.222	0.602	9.569	0.259	0.061	0.073	0.121
2019	Lion	0.029	0.247	0.031	0.149	0.035	0.246	0.568	9.923	0.220	0.060	0.085	0.137
2014	OIB	0.031	0.237	0.034	0.163	0.022	0.401	0.537	8.724	0.373	0.055	0.103	0.081
2015	OIB	0.028	0.254	0.032	0.143	0.022	0.392	0.575	9.163	0.209	0.051	0.104	0.077
2016	OIB	0.024	0.215	0.016	0.104	0.027	0.344	0.649	9.331	0.230	0.067	0.078	0.097
2017	OIB	0.021	0.195	0.014	0.094	0.032	0.385	0.655	9.698	0.247	0.050	0.098	0.072
2018	OIB	0.031	0.351	0.034	0.121	0.032	0.390	0.513	10.077	0.292	0.052	0.073	0.121
2019	OIB	0.029	0.237	0.027	0.127	0.029	0.257	0.582	10.367	0.193	0.059	0.085	0.137
2014	Zemen	0.031	0.213	0.041	0.270	0.050	0.549	0.513	8.275	0.493	0.041	0.103	0.081
2015	Zemen	0.033	0.216	0.040	0.250	0.046	0.477	0.451	8.492	0.302	0.048	0.104	0.077
2016	Zemen	0.033	0.220	0.043	0.240	0.048	0.478	0.456	8.906	0.403	0.031	0.078	0.097
2017	Zemen	0.031	0.230	0.041	0.300	0.046	0.521	0.469	9.177	0.434	0.025	0.098	0.072
2018	Zemen	0.025	0.184	0.045	0.260	0.038	0.373	0.506	9.429	0.397	0.035	0.073	0.121
2019	Zemen	0.036	0.240	0.044	0.260	0.020	0.359	0.396	9.595	0.217	0.044	0.085	0.137
2014	Bunna	0.031	0.179	0.032	0.220	0.027	0.390	0.553	8.010	0.415	0.058	0.103	0.081
2015	Bunna	0.034	0.225	0.045	0.220	0.021	0.361	0.536	8.412	0.234	0.061	0.104	0.077
2016	Bunna	0.033	0.228	0.024	0.132	0.035	0.332	0.553	8.828	0.233	0.058	0.078	0.097
2017	Bunna	0.024	0.174	0.020	0.138	0.029	0.318	0.645	9.192	0.276	0.048	0.098	0.072
2018	Bunna	0.028	0.189	0.028	0.174	0.039	0.258	0.574	9.474	0.268	0.066	0.073	0.121
2019	Bunna	0.034	0.203	0.035	0.197	0.038	0.300	0.551	9.582	0.216	0.070	0.085	0.137
2014	Berhan	0.036	0.190	0.036	0.210	0.036	0.438	0.488	7.942	0.488	0.061	0.103	0.081
2015	Berhan	0.030	0.164	0.038	0.255	0.023	0.436	0.540	8.336	0.405	0.041	0.104	0.077
2016	Berhan	0.033	0.251	0.035	0.222	0.025	0.414	0.508	8.881	0.268	0.057	0.078	0.097
2017	Berhan	0.035	0.222	0.048	0.260	0.021	0.409	0.497	9.258	0.316	0.056	0.098	0.072
2018	Berhan	0.027	0.160	0.030	0.200	0.025	0.281	0.636	9.552	0.246	0.063	0.073	0.121
2019	Berhan	0.028	0.183	0.028	0.170	0.036	0.304	0.686	9.861	0.204	0.058	0.085	0.137
2014	Abay	0.022	0.142	0.022	0.176	0.025	0.444	0.671	8.070	0.342	0.040	0.103	0.081
2015	Abay	0.032	0.205	0.032	0.180	0.021	0.428	0.584	8.430	0.246	0.050	0.104	0.077
2016	Abay	0.027	0.175	0.028	0.182	0.024	0.340	0.619	8.730	0.233	0.057	0.078	0.097
2017	Abay	0.026	0.165	0.025	0.178	0.016	0.367	0.622	9.062	0.269	0.049	0.098	0.072
2018	Abay	0.030	0.202	0.030	0.172	0.029	0.337	0.563	9.419	0.308	0.050	0.073	0.121
2019	Abay	0.034	0.200	0.039	0.189	0.030	0.399	0.501	9.623	0.281	0.050	0.085	0.137

2014	Addis	0.029	0.201	0.035	0.250	0.005	0.585	0.500	7.141	0.531	0.038	0.103	0.081
2015	Addis	0.030	0.153	0.034	0.260	0.008	0.539	0.530	7.447	0.441	0.041	0.104	0.077
2016	Addis	0.025	0.157	0.032	0.240	0.017	0.492	0.513	7.809	0.491	0.046	0.078	0.097
2017	Addis	0.031	0.132	0.026	0.210	0.017	0.471	0.591	8.136	0.407	0.042	0.098	0.072
2018	Addis	0.030	0.136	0.020	0.160	0.019	0.411	0.561	8.345	0.349	0.047	0.073	0.121
2019	Addis	0.026	0.159	0.029	0.200	0.036	0.393	0.558	8.615	0.336	0.048	0.085	0.137
2014	Enat	0.020	0.098	0.037	0.371	0.010	0.650	0.714	7.257	0.462	0.021	0.103	0.081
2015	Enat	0.029	0.143	0.032	0.270	0.018	0.363	0.523	7.700	0.321	0.034	0.104	0.077
2016	Enat	0.029	0.142	0.031	0.260	0.007	0.418	0.515	8.086	0.279	0.032	0.078	0.097
2017	Enat	0.025	0.127	0.025	0.230	0.013	0.402	0.570	8.486	0.295	0.024	0.098	0.072
2018	Enat	0.028	0.152	0.029	0.220	0.016	0.348	0.495	8.777	0.263	0.035	0.073	0.121
2019	Enat	0.026	0.148	0.021	0.160	0.021	0.244	0.536	9.127	0.238	0.033	0.085	0.137
2014	Debub	0.010	0.007	0.013	0.293	0.044	0.520	0.714	6.877	1.532	0.044	0.103	0.081
2015	Debub	0.016	0.086	0.022	0.237	0.027	0.570	0.747	7.042	0.619	0.041	0.104	0.077
2016	Debub	0.032	0.191	0.044	0.240	0.020	0.535	0.539	7.164	0.286	0.064	0.078	0.097
2017	Debub	0.030	0.136	0.024	0.190	0.029	0.563	0.663	7.632	0.477	0.042	0.098	0.072
2018	Debub	0.035	0.193	0.040	0.240	0.021	0.492	0.582	8.090	0.383	0.053	0.073	0.121
2019	Debub	0.039	0.231	0.039	0.250	0.034	0.537	0.465	8.610	0.393	0.041	0.085	0.137

Source: Computed from the commercial banks audited financial statements

Appendixes II

Hausman and CLRM tests of AROA as extracted from Eviews 9

1.1 AROA Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.259534	9	0.4137

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
RGDP	0.029815	0.019011	0.000056	0.1490
OC_OI	-0.054555	-0.054234	0.000003	0.8402
NPL_RATIO	-0.038162	-0.024345	0.000334	0.4495
NIM	0.188444	0.168932	0.001212	0.5751
NII_TI	0.037493	0.033969	0.000014	0.3466
LNBS	0.001738	0.000123	0.000001	0.0292
LA_DP	-0.008659	-0.010336	0.000001	0.0257
INF	0.020300	0.035398	0.000108	0.1466
CAR_RATIO	-0.017225	-0.014105	0.000032	0.5793

Cross-section random effects test equation:

Dependent Variable: AROA

Method: Panel Least Squares

Date: 01/09/21 Time: 21:19

Sample: 2014 2019

Periods included: 6

Cross-sections included: 16

Total panel (balanced) observations: 96

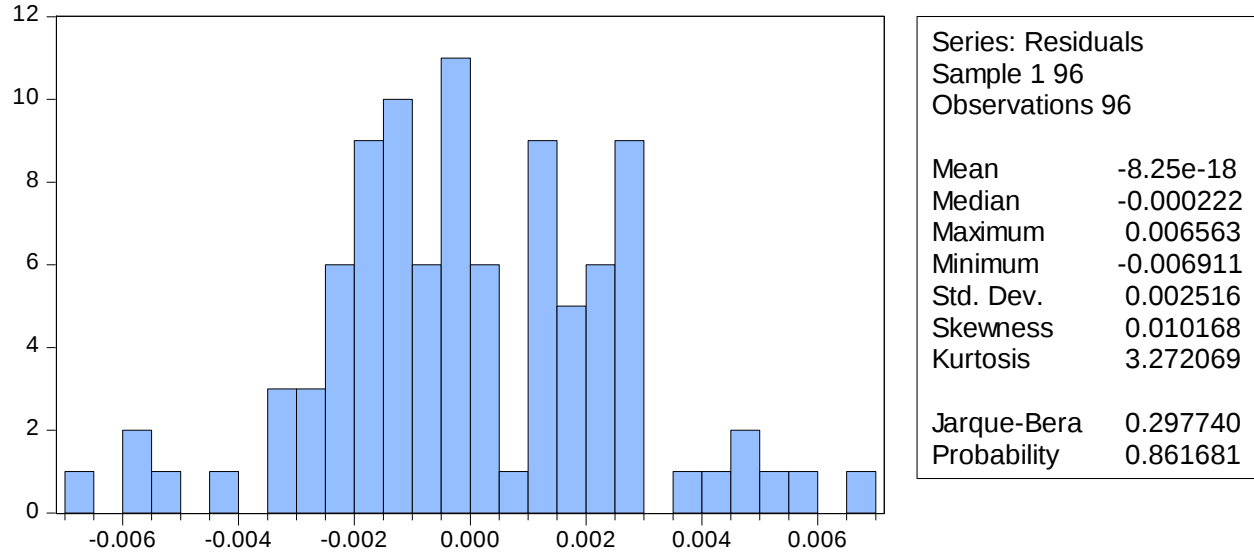
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.021641	0.013034	1.660313	0.1013
RGDP	0.029815	0.029568	1.008376	0.3167
OC_OI	-0.054555	0.004134	-13.19767	0.0000
NPL_RATIO	-0.038162	0.036918	-1.033707	0.3048
NIM	0.188444	0.051926	3.629067	0.0005
NII_TI	0.037493	0.006430	5.830893	0.0000
LNBS	0.001738	0.000971	1.789969	0.0777
LA_DP	-0.008659	0.002006	-4.315537	0.0001
INF	0.020300	0.019238	1.055233	0.2949
CAR_RATIO	-0.017225	0.009624	-1.789753	0.0778

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.907383	Mean dependent var	0.027770
Adjusted R-squared	0.876076	S.D. dependent var	0.006327
S.E. of regression	0.002227	Akaike info criterion	-9.156749
Sum squared resid	0.000352	Schwarz criterion	-8.488950
Log likelihood	464.5240	Hannan-Quinn criter.	-8.886814
F-statistic	28.98330	Durbin-Watson stat	2.421818
Prob(F-statistic)	0.000000		

1.2 AROA Normality Test



1.3 AROA Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.758527	Prob. F(9,86)	0.0881
Obs*R-squared	14.92110	Prob. Chi-Square(9)	0.0931
Scaled explained SS	13.60338	Prob. Chi-Square(9)	0.1371

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/09/21 Time: 21:28
Sample: 1 96
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.30E-05	3.13E-05	1.696185	0.0935
RGDP	-0.000162	0.000116	-1.404890	0.1637
OC_OI	1.12E-06	1.39E-05	0.080407	0.9361
NPL_RATIO	6.87E-05	0.000104	0.660777	0.5105
NIM	9.06E-05	0.000117	0.774800	0.4406
NII_TI	2.20E-05	1.60E-05	1.372944	0.1733
LNBS	-3.55E-06	1.73E-06	-2.055406	0.0429
LA_DP	-8.98E-06	6.95E-06	-1.292425	0.1997
INF	-3.49E-05	6.15E-05	-0.567652	0.5718
CAR_RATIO	-4.18E-05	2.43E-05	-1.722453	0.0886

R-squared	0.155428	Mean dependent var	6.26E-06
Adjusted R-squared	0.067043	S.D. dependent var	9.49E-06
S.E. of regression	9.16E-06	Akaike info criterion	-20.26408
Sum squared resid	7.22E-09	Schwarz criterion	-19.99696
Log likelihood	982.6760	Hannan-Quinn criter.	-20.15611
F-statistic	1.758527	Durbin-Watson stat	2.011852
Prob(F-statistic)	0.088107		

1.4 AROA Breusch Godfrey LM test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.500760	Prob. F(2,84)	0.2289
Obs*R-squared	3.311963	Prob. Chi-Square(2)	0.1909

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 01/09/21 Time: 21:27

Sample: 1 96

Included observations: 96

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	0.001053	0.034099	0.030875	0.9754
OC_OI	0.000810	0.004015	0.201645	0.8407
NPL_RATIO	-0.004190	0.029926	-0.140012	0.8890
NIM	-0.001933	0.033557	-0.057613	0.9542
NII_TI	0.000639	0.004620	0.138372	0.8903
LNBS	0.000106	0.000500	0.211629	0.8329
LA_DP	0.000154	0.001996	0.077130	0.9387
INF	-0.004481	0.017965	-0.249452	0.8036
CAR_RATIO	-0.000415	0.006974	-0.059461	0.9527
C	-0.001077	0.009001	-0.119631	0.9051
RESID(-1)	0.185277	0.114571	1.617139	0.1096
RESID(-2)	0.040283	0.114245	0.352604	0.7253

R-squared	0.034500	Mean dependent var	-8.25E-18
Adjusted R-squared	-0.091935	S.D. dependent var	0.002516
S.E. of regression	0.002629	Akaike info criterion	-8.928261
Sum squared resid	0.000580	Schwarz criterion	-8.607718
Log likelihood	440.5565	Hannan-Quinn criter.	-8.798692
F-statistic	0.272865	Durbin-Watson stat	1.977782
Prob(F-statistic)	0.989268		

1.5 AROA VIF test

Variance Inflation Factors

Date: 01/09/21 Time: 21:28

Sample: 1 96

Included observations: 96

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
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RGDP	0.001111	126.1010	2.299089
OC_OI	1.60E-05	70.98937	1.334817
NPL_RATIO	0.000900	10.01135	1.272658
NIM	0.001138	41.73992	1.669588
NII_TI	2.14E-05	41.23001	3.434093
LNBS	2.49E-07	296.9344	3.250663
LA_DP	4.01E-06	7.140623	1.869464
INF	0.000315	43.60156	2.490622
CAR_RATIO	4.90E-05	26.39944	1.895216
C	8.14E-05	1117.976	NA

1.6 AROA CORRELATION

	RGDP	OC_OI	NPL	NIM	NII_TI	LNBS	LA_DP	INF	CAR
RGDP	1								
OC_OI	-0.153930	1							
NPL_RATIO	-0.076570	0.097940	1						
NIM	-0.290070	0.189207	0.218427	1					
NII_TI	0.392384	-0.24423	-0.125335	-0.547850	1				
LNBS	-0.330430	0.001155	0.110041	0.358002	-0.752430	1			
LA_DP	0.170111	0.211101	0.267925	-0.160760	0.437804	-0.549320	1		
INF	-0.740120	0.076450	0.151839	0.301849	-0.450750	0.400446	-0.234980	1	
CAR_RATIO	0.231634	-0.219790	-0.114675	-0.497590	0.576385	-0.583570	0.308558	-0.218970	1

Hausman and CLRM tests of AROE as extracted from Eviews 9

2.1 AROE Huasman test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	15.396202	9	0.0806

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
RGDP	-0.357782	-0.157900	0.006643	0.0142
OC_OI	-0.368399	-0.365947	0.000332	0.8929
NPL_RATIO	-0.213513	-0.013431	0.044253	0.3415
NIM	0.033494	0.996258	0.144171	0.0112
NII_TI	0.290353	0.342429	0.001778	0.2169
LNBS	0.014703	0.025264	0.000063	0.1834
LA_DP	-0.071490	-0.063028	0.000073	0.3208
INF	0.338261	0.162219	0.012332	0.1129
CAR_RATIO	-0.257445	-0.386055	0.003978	0.0415

Cross-section random effects test equation:

Dependent Variable: AROE

Method: Panel Least Squares

Date: 01/05/21 Time: 19:05

Sample: 2014 2019

Periods included: 6

Cross-sections included: 16

Total panel (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.236103	0.131078	1.801237	0.0759
RGDP	-0.357782	0.297350	-1.203236	0.2329
OC_OI	-0.368399	0.041571	-8.862012	0.0000
NPL_RATIO	-0.213513	0.371272	-0.575084	0.5671
NIM	0.033494	0.522205	0.064139	0.9490
NII_TI	0.290353	0.064664	4.490158	0.0000
LNBS	0.014703	0.009765	1.505696	0.1366
LA_DP	-0.071490	0.020178	-3.542938	0.0007
INF	0.338261	0.193466	1.748424	0.0847
CAR_RATIO	-0.257445	0.096785	-2.659978	0.0097

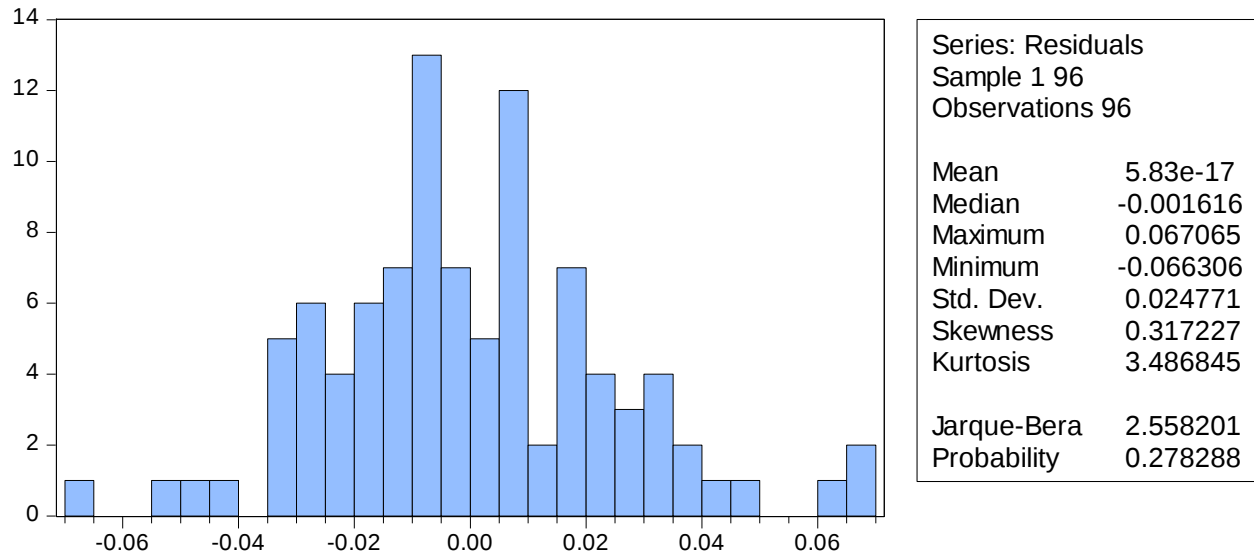
Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.875388	Mean dependent var	0.195063
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Adjusted R-squared	0.833266	S.D. dependent var	0.054859
S.E. of regression	0.022401	Akaike info criterion	-4.540284
Sum squared resid	0.035627	Schwarz criterion	-3.872485
Log likelihood	242.9336	Hannan-Quinn criter.	-4.270349
F-statistic	20.78209	Durbin-Watson stat	2.147796
Prob(F-statistic)	0.000000		

2.2 AROE Normality Test



2.3 Breusch Godfrey LM test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.609737	Prob. F(2,84)	0.0795
Obs*R-squared	5.616145	Prob. Chi-Square(2)	0.0603

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 01/05/21 Time: 19:09

Sample: 1 96

Included observations: 96

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-0.114632	0.330037	-0.347331	0.7292
OC_OI	0.004654	0.039482	0.117867	0.9065
NPL_RATIO	0.005574	0.291626	0.019112	0.9848
NIM	-0.036818	0.326523	-0.112757	0.9105
NII_TI	0.005216	0.044895	0.116193	0.9078
LNBS	0.001197	0.004883	0.245047	0.8070
LA_DP	0.007655	0.019707	0.388455	0.6987
INF	-0.042598	0.176588	-0.241227	0.8100
CAR_RATIO	0.016964	0.068962	0.245992	0.8063
C	-0.005016	0.089512	-0.056033	0.9554
RESID(-1)	0.252141	0.115204	2.188638	0.0314
RESID(-2)	0.011831	0.115528	0.102404	0.9187

R-squared	0.058502	Mean dependent var	5.83E-17
Adjusted R-squared	-0.064790	S.D. dependent var	0.024771
S.E. of regression	0.025561	Akaike info criterion	-4.379012
Sum squared resid	0.054884	Schwarz criterion	-4.058469
Log likelihood	222.1926	Hannan-Quinn criter.	-4.249444
F-statistic	0.474498	Durbin-Watson stat	1.977234
Prob(F-statistic)	0.914120		

2.4 AROE MULTICOLLINEARITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.024851	Prob. F(9,86)	0.4270
Obs*R-squared	9.298860	Prob. Chi-Square(9)	0.4102
Scaled explained SS	9.279038	Prob. Chi-Square(9)	0.4119

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/05/21 Time: 19:10
Sample: 1 96
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001379	0.003281	0.420141	0.6754
RGDP	-0.006965	0.012121	-0.574648	0.5670
OC_OI	-0.000740	0.001457	-0.508267	0.6126
NPL_RATIO	-0.004419	0.010910	-0.405080	0.6864
NIM	0.004477	0.012267	0.364977	0.7160
NII_TI	0.002478	0.001681	1.474192	0.1441
LNBS	-2.04E-05	0.000181	-0.112736	0.9105
LA_DP	7.14E-05	0.000729	0.097963	0.9222
INF	0.005078	0.006453	0.786895	0.4335
CAR_RATIO	-0.005522	0.002546	-2.169294	0.0328

R-squared	0.096863	Mean dependent var	0.000607
Adjusted R-squared	0.002349	S.D. dependent var	0.000963
S.E. of regression	0.000961	Akaike info criterion	-10.95787
Sum squared resid	7.95E-05	Schwarz criterion	-10.69075
Log likelihood	535.9777	Hannan-Quinn criter.	-10.84990
F-statistic	1.024851	Durbin-Watson stat	1.790047
Prob(F-statistic)	0.427029		

2.5 AROE correlation

	RGDP	OC_OI	NPL_RATIO	NIM	NII_TI	LNBS	LA_DP	INF	CAR_RATIO
RGDP	1.000000	-0.153931	-0.076569	-0.290065	0.392384	-0.330428	0.170111	-0.740118	0.231634
OC_OI	-0.153931	1.000000	0.097940	0.189207	-0.244231	0.001155	0.211101	0.076450	-0.219792
NPL_RATIO	-0.076569	0.097940	1.000000	0.218427	-0.125335	0.110041	0.267925	0.151839	-0.114675
NIM	-0.290065	0.189207	0.218427	1.000000	-0.547845	0.358002	-0.160761	0.301849	-0.497594
NII_TI	0.392384	-0.244231	-0.125335	-0.547845	1.000000	-0.752427	0.437804	-0.450753	0.576385
LNBS	-0.330428	0.001155	0.110041	0.358002	-0.752427	1.000000	-0.549317	0.400446	-0.583570
LA_DP	0.170111	0.211101	0.267925	-0.160761	0.437804	-0.549317	1.000000	-0.234984	0.308558
INF	-0.740118	0.076450	0.151839	0.301849	-0.450753	0.400446	-0.234984	1.000000	-0.218972
CAR_RATIO	0.231634	-0.219792	-0.114675	-0.497594	0.576385	-0.583570	0.308558	-0.218972	1.000000

2.6 AROE VIF

Variance Inflation Factors

Date: 01/05/21 Time: 19:10

Sample: 1 96

Included observations: 96

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
RGDP	0.107719	126.1010	2.299089
OC_OI	0.001556	70.98937	1.334817
NPL_RATIO	0.087279	10.01135	1.272658
NIM	0.110332	41.73992	1.669588
NII_TI	0.002071	41.23001	3.434093
LNBS	2.41E-05	296.9344	3.250663
LA_DP	0.000389	7.140623	1.869464
INF	0.030535	43.60156	2.490622
CAR_RATIO	0.004751	26.39944	1.895216
C	0.007894	1117.976	NA

Hausman and CLRM tests of RORWA as extracted from Eviews 9

3.1 RORWA Huasman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.693134	9	0.8602

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
RGDP	0.025481	0.031649	0.000171	0.6375
OC_OI	-0.050817	-0.050876	0.000009	0.9840
NPL_RATIO	-0.049288	-0.000468	0.001145	0.1491
NIM	0.142090	0.205095	0.003719	0.3015
NII_TI	0.025571	0.031126	0.000046	0.4125
LNBS	0.001179	0.001920	0.000002	0.5607
LA_DP	-0.011912	-0.011802	0.000002	0.9361
INF	0.029866	0.017735	0.000318	0.4962
CAR_RATIO	0.087023	0.081703	0.000103	0.5998

Cross-section random effects test equation:

Dependent Variable: RORWA

Method: Panel Least Squares

Date: 01/08/21 Time: 05:36

Sample: 2014 2019

Periods included: 6

Cross-sections included: 16

Total panel (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015299	0.021008	0.728227	0.4689
RGDP	0.025481	0.047657	0.534683	0.5945
OC_OI	-0.050817	0.006663	-7.627226	0.0000
NPL_RATIO	-0.049288	0.059504	-0.828312	0.4103
NIM	0.142090	0.083694	1.697722	0.0939
NII_TI	0.025571	0.010364	2.467335	0.0160
LNBS	0.001179	0.001565	0.753391	0.4537
LA_DP	-0.011912	0.003234	-3.683462	0.0004
INF	0.029866	0.031007	0.963193	0.3387
CAR_RATIO	0.087023	0.015512	5.610136	0.0000

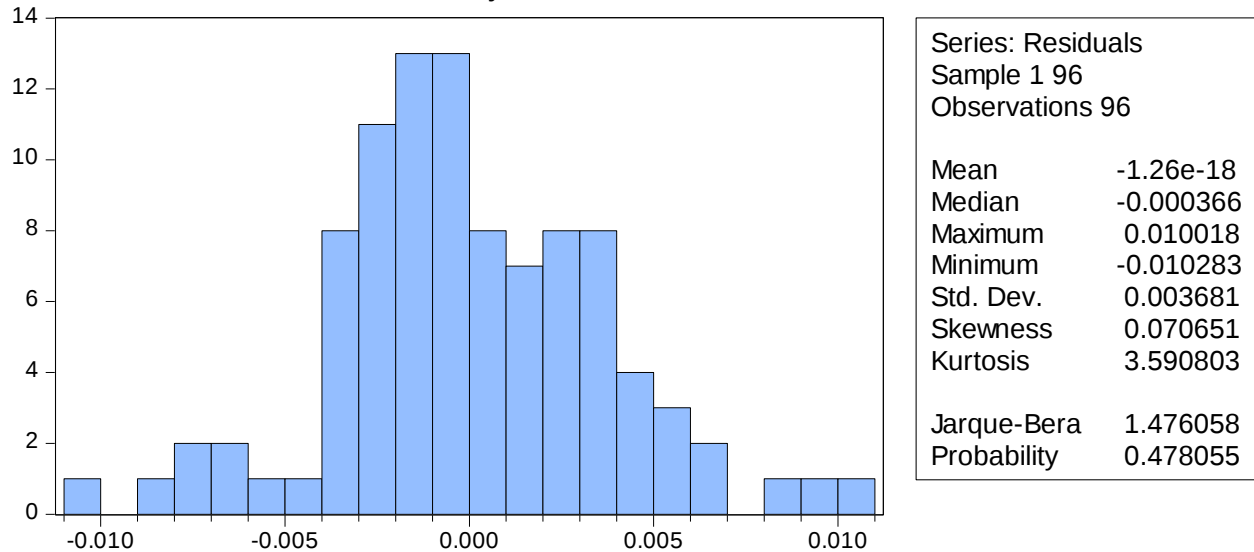
Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.849511	Mean dependent var	0.030854
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Adjusted R-squared	0.798641	S.D. dependent var	0.008001
S.E. of regression	0.003590	Akaike info criterion	-8.202061
Sum squared resid	0.000915	Schwarz criterion	-7.534262
Log likelihood	418.6989	Hannan-Quinn criter.	-7.932126
F-statistic	16.69977	Durbin-Watson stat	2.734842
Prob(F-statistic)	0.000000		

3.2 RORWA Normality test



3.3 RORWA Breusch-pegan Godfrey test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.766896	Prob. F(2,84)	0.1772
Obs*R-squared	3.875577	Prob. Chi-Square(2)	0.1440

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 01/08/21 Time: 05:38

Sample: 1 96

Included observations: 96

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-0.006002	0.048493	-0.123767	0.9018
OC_OI	0.000144	0.005825	0.024683	0.9804
NPL_RATIO	-2.62E-05	0.043511	-0.000602	0.9995
NIM	-0.000235	0.048974	-0.004789	0.9962
NII_TI	0.001093	0.006727	0.162542	0.8713
LNBS	0.000220	0.000734	0.299604	0.7652
LA_DP	0.000601	0.002930	0.205038	0.8380
INF	-0.000153	0.026086	-0.005882	0.9953
CAR_RATIO	0.002377	0.010254	0.231797	0.8173
C	-0.002582	0.013160	-0.196198	0.8449
RESID(-1)	0.080810	0.111619	0.723983	0.4711
RESID(-2)	0.184558	0.111771	1.651210	0.1024

R-squared	0.040371	Mean dependent var	-1.26E-18
Adjusted R-squared	-0.085295	S.D. dependent var	0.003681
S.E. of regression	0.003834	Akaike info criterion	-8.173171
Sum squared resid	0.001235	Schwarz criterion	-7.852627
Log likelihood	404.3122	Hannan-Quinn criter.	-8.043602
F-statistic	0.321254	Durbin-Watson stat	2.009414
Prob(F-statistic)	0.979199		

3.4 RORWA MULTICOLLINEARITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.213094	Prob. F(9,86)	0.2977
Obs*R-squared	10.81445	Prob. Chi-Square(9)	0.2886
Scaled explained SS	11.24251	Prob. Chi-Square(9)	0.2595

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/08/21 Time: 05:39
Sample: 1 96
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.05E-05	7.33E-05	0.142632	0.8869
RGDP	-0.000639	0.000271	-2.361821	0.0204
OC_OI	-2.02E-06	3.25E-05	-0.062154	0.9506
NPL_RATIO	0.000265	0.000244	1.085760	0.2806
NIM	7.74E-05	0.000274	0.282370	0.7783
NII_TI	4.17E-05	3.75E-05	1.110184	0.2700
LNBS	5.41E-06	4.05E-06	1.335918	0.1851
LA_DP	-1.25E-05	1.63E-05	-0.766508	0.4455
INF	-0.000279	0.000144	-1.933203	0.0565
CAR_RATIO	8.71E-05	5.69E-05	1.532049	0.1292

R-squared	0.112651	Mean dependent var	1.34E-05
Adjusted R-squared	0.019788	S.D. dependent var	2.17E-05
S.E. of regression	2.15E-05	Akaike info criterion	-18.56102
Sum squared resid	3.97E-08	Schwarz criterion	-18.29390
Log likelihood	900.9289	Hannan-Quinn criter.	-18.45304
F-statistic	1.213094	Durbin-Watson stat	1.795127
Prob(F-statistic)	0.297683		

3.5 RORWA VIF

Variance Inflation Factors
Date: 01/08/21 Time: 05:39
Sample: 1 96
Included observations: 96

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
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RGDP	0.002378	126.1010	2.299089
OC_OI	3.43E-05	70.98937	1.334817
NPL_RATIO	0.001927	10.01135	1.272658
NIM	0.002436	41.73992	1.669588
NII_TI	4.57E-05	41.23001	3.434093
LNBS	5.33E-07	296.9344	3.250663
LA_DP	8.60E-06	7.140623	1.869464
INF	0.000674	43.60156	2.490622
CAR_RATIO	0.000105	26.39944	1.895216
C	0.000174	1117.976	NA

3.6 RORWA Correlation Matrix

	RGDP	OC_OI	NPL_RATIO	NIM	NII_TI	LNBS	LA_DP	INF	CAR_RATIO
RGDP	1.000000	-0.153931	-0.076569	-0.290065	0.392384	-0.330428	0.170111	-0.740118	0.231634
OC_OI	-0.153931	1.000000	0.097940	0.189207	-0.244231	0.001155	0.211101	0.076450	-0.219792
NPL_RATIO	-0.076569	0.097940	1.000000	0.218427	-0.125335	0.110041	0.267925	0.151839	-0.114675
NIM	-0.290065	0.189207	0.218427	1.000000	-0.547845	0.358002	-0.160761	0.301849	-0.497594
NII_TI	0.392384	-0.244231	-0.125335	-0.547845	1.000000	-0.752427	0.437804	-0.450753	0.576385
LNBS	-0.330428	0.001155	0.110041	0.358002	-0.752427	1.000000	-0.549317	0.400446	-0.583570
LA_DP	0.170111	0.211101	0.267925	-0.160761	0.437804	-0.549317	1.000000	-0.234984	0.308558
INF	-0.740118	0.076450	0.151839	0.301849	-0.450753	0.400446	-0.234984	1.000000	-0.218972
CAR_RATIO	0.231634	-0.219792	-0.114675	-0.497594	0.576385	-0.583570	0.308558	-0.218972	1.000000

Appendix III

Random Effect Regression analysis between AROA and Explanatory Variables

Dependent Variable: AROA
Method: Panel EGLS (Cross-section random effects)
Date: 01/09/21 Time: 21:17
Sample: 2014 2019
Periods included: 6
Cross-sections included: 16
Total panel (balanced) observations: 96
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	0.019011	0.028604	0.664637	0.5081
OC_OI	-0.054234	0.003816	-14.21145	0.0000*
NPL	-0.024345	0.032080	-0.758888	0.4500
NIM	0.168932	0.038530	4.384395	0.0000*
NII_TI	0.033969	0.005228	6.497916	0.0000*
LNBS	0.000123	0.000628	0.195247	0.8457
LA_DP	-0.010336	0.001860	-5.556791	0.0000*
INF	0.035398	0.016184	2.187235	0.0314**
CAR	-0.014105	0.007807	-1.806618	0.0743***
C	0.037748	0.009780	3.859746	0.0002
Effects Specification				
			S.D.	Rho
Cross-section random			0.001553	0.3270
Idiosyncratic random			0.002227	0.6730
Weighted Statistics				
R-squared	0.859928	Mean dependent var		0.014034
Adjusted R-squared	0.845269	S.D. dependent var		0.005737
S.E. of regression	0.002257	Sum squared resid		0.000438
F-statistic	58.66325	Durbin-Watson stat		2.088945
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.833552	Mean dependent var		0.027770
Sum squared resid	0.000633	Durbin-Watson stat		1.444914

Source: Eviews 9 output (*, **and *** denotes significance level at 1%, 5% and 10% respectively.

Random Effect Regression analysis between AROE and Explanatory Variables

Dependent Variable: AROE
Method: Panel EGLS (Cross-section random effects)
Date: 01/05/21 Time: 18:41
Sample: 2014 2019
Periods included: 6
Cross-sections included: 16
Total panel (balanced) observations: 96

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-0.157900	0.285962	-0.552172	0.5823
OC_OI	-0.365947	0.037371	-9.792372	0.0000
NPL_RATIO	-0.013431	0.305925	-0.043905	0.9651
NIM	0.996258	0.358506	2.778915	0.0067
NII_TI	0.342429	0.049020	6.985456	0.0000
LNBS	0.025264	0.005686	4.443135	0.0000
LA_DP	-0.063028	0.018290	-3.446094	0.0009
INF	0.162219	0.158422	1.023969	0.3087
CAR_RATIO	-0.386055	0.073409	-5.259001	0.0000
C	0.085118	0.092009	0.925105	0.3575
Effects Specification				
			S.D.	Rho
Cross-section random			0.011631	0.2124
Idiosyncratic random			0.022401	0.7876
Weighted Statistics				
R-squared	0.778340	Mean dependent var		0.120565
Adjusted R-squared	0.755143	S.D. dependent var		0.047428
S.E. of regression	0.023469	Sum squared resid		0.047367
F-statistic	33.55342	Durbin-Watson stat		1.659617
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.788923	Mean dependent var		0.195063
Sum squared resid	0.060348	Durbin-Watson stat		1.302635

Source: Eviews 9 output (*, **and *** denotes significance level at 1%, 5% and 10% respectively.

Random Effect Regression analysis between RORWA and Explanatory Variables

Dependent Variable: RORWA
Method: Panel EGLS (Cross-section random effects)
Date: 01/08/21 Time: 05:32
Sample: 2014 2019
Periods included: 6
Cross-sections included: 16
Total panel (balanced) observations: 96
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	0.031649	0.045824	0.690676	0.4916
OC_OI	-0.050876	0.005984	-8.501603	0.0000*
NPL_RATIO	-0.000468	0.048946	-0.009552	0.9924
NIM	0.205095	0.057321	3.578039	0.0006*
NII_TI	0.031126	0.007839	3.970699	0.0001*
LNBS	0.001920	0.000908	2.114033	0.0374**
LA_DP	-0.011802	0.002929	-4.029215	0.0001*

INF	0.017735	0.025372	0.699015	0.4864
CAR_RATIO	0.081703	0.011740	6.959290	0.0000*
C	0.003584	0.014717	0.243507	0.8082
Effects Specification				
			S.D.	Rho
Cross-section random			0.001847	0.2092
Idiosyncratic random			0.003590	0.7908
Weighted Statistics				
R-squared	0.780115	Mean dependent var		0.019182
Adjusted R-squared	0.757103	S.D. dependent var		0.007186
S.E. of regression	0.003542	Sum squared resid		0.001079
F-statistic	33.90141	Durbin-Watson stat		2.361820
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.785549	Mean dependent var		0.030854
Sum squared resid	0.001304	Durbin-Watson stat		1.953692

Source: Eviews 9 output (*, **and *** denotes significance level at 1%, 5% and 10% respectively