

**THE EFFECTS OF FOREIGN CURRENCY FLUCTUATION ON
PROFITABILITY: A STUDY ON SELECTED ETHIOPIAN PRIVATE
COMMERCIAL BANKS**

*A Thesis Submitted to post graduate program presented in Partial Fulfilment of the
Requirements for the Degree of Master of Science
(MSc) Accounting and finance*

By:

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**JIMMA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
ACCOUNTING AND FINANCE PROGRAM**

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*A Thesis Submitted to the school of graduate studies of Jimma University in Partial
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and Finance (MSc)*

**JIMMA UNIVERSITY
ACCOUNTING AND FINANCE PROGRAM
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APPROVAL SHEET

I hereby certify that I have read and evaluated this Thesis entitled: “The Effects of Foreign Currency Fluctuation on Profitability: A study on selected Ethiopian private banks”, by Mr. Bereket Agza Woldemariam prepared under my guidance and supervision. I recommend that it could be submitted as fulfilling the Thesis requirement.

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As a member of the Board of Examiners of the Accounting Thesis Open Defence Examination, we certify that we have read, and evaluated the thesis prepared by Bereket Agza Woldemariam and examined the candidate. We recommended that the thesis be accepted as fulfilling the thesis requirements for the Degree of Master of Science Accounting and Finance. Final approval and acceptance of the thesis is contingent upon the submission of its final copy to the Council of Graduate Studies (CGS) through the candidate’s department or school graduate committee (DGC or SGS).

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DECLARATION

I hereby declare that this thesis entitled “The effects of foreign currency fluctuation on profitability: A study on selected Ethiopian private banks”, was carried out in accordance with regulations of the University and was prepared by me, with the guidance and supervision of my advisors. The study has not been previously submitted for any degree at any higher institution. The work contained herein is my own except where explicitly stated otherwise in the text, and that this work.

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ABSTRACT

Exchange rate plays an increasingly significant role in banking industry in Ethiopia as it directly and indirectly affects domestic selling price level, profitability, allocation of resources and investment decision in the industry. The fluctuation or volatility in the exchange rate has piqued the public's interest, especially among importers, who claim that the weakening birr is eroding their competitiveness. The objective of this study is to determine the effect of foreign currency exchange rate fluctuation on the bank profitability in Ethiopia. Secondary data were collected from the National Bank of Ethiopia and banks Financial Report. Regression analysis was done for the periods to determine the effect of foreign exchange rate fluctuation on the private banks performance. Financial institutions including intermediary commercial banks are more exposed to the effect of currency fluctuation or exchange rate fluctuation. It stems primarily from the effect of exchange rates on bank clients' business and the economy as a whole. As a result, understanding the overall effect of foreign currency fluctuation on bank profitability is critical for devising an effective coping strategy. As a result, the aim of this study is to investigate the effect of foreign currency fluctuation on the profitability (ROA) of commercial banks in Ethiopia using a balanced panel data set covering of fourteen Ethiopian private banks over the period of 2012/13-2019/20 G.C. The collected data were quantitatively analyzed using STATA 14 software. The foreign currency fluctuation (USD) positively and (SEK) negatively affects the firm financial performance. Thus, the study concludes that the most foreign currencies fluctuation positively affect financial performance of banks in Ethiopia. From the findings and conclusion, the study recommends that the issues related to foreign currency fluctuation should always be taken in to account in efforts to improve private commercial banks financial performance.

Key words: Currency fluctuation, Private bank, Profitability

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ACRONYMS

AIB	Awash International Bank
BOA	Bank of Abyssinia
CBO	Cooperative Bank of Oromia
DB	Dashen Bank
FCY	Foreign currency
GBP	Great Britain Pound
INF	Inflation Rate
LCY	Local Currency
NBE	National Bank of Ethiopia
NIB	Nib International Bank
ROA	Return on Asset
SEK	Swedish Kroner
UNB	United (Hibret) Bank
USD	United states of American Dollar
WGB	Wegagen Bank
YEN	Japan Yen

CHAPTER ONE

1 INTRODUCTION

1.1 Background of the study

Since banks play such an important role in the economy, the banking industry is one of the most highly regulated in the world. It also receives a lot of coverage in the economic literature. Again, banks play an important role in economic development through the mobilization of funds from within and outside the country and channelling such funds to various sectors of the economy by the moveable fund (Tadesse Getachew, 2015). The best financial results reward shareholders for their investment as a result of banks. As a result, further spending is encouraged, resulting in economic growth.

Banks must be competitive in order to provide long-term intermediation services in the economy and a fair return to shareholders. If they can generate enough money to cover their operating costs, they can do so. On the other hand, bad or poor banking performance can lead to banking failure and crisis which have negative repercussions on economic growth (Ongore and Kusa, 2013).

Many companies have been motivated by globalization to expand their businesses across regional borders in order to gain a competitive advantage and economies of scale, resulting in foreign trade involving multiple currencies. Foreign exchange rate volatility is a potentially interesting factor that influences commercial banks' profitability by affecting their financial intermediation process (Chiira, 2009).

Globalization and technological advances have changed the nature of the business conditions in which businesses work dramatically over the last decade (Kipchirchir, 2011). As a result, business leaders must continually assess and identify the factors that influence how their companies operate. Particularly, macro-economic variables such as fluctuations in exchange rates have not only been influenced by the business returns but also the sustainability in the business operations. Because of its role in a country's economic growth, the foreign exchange market has grown to become one of the largest financial markets (Bakare, 2011).

As international competitiveness increases, the demand and supply for foreign exchange also increase and this upsurge the volume of foreign exchange transactions. This results in constant

changes in the exchange rates which are highly unpredictable leading to many economic losses. Despite theoretical frameworks such as Purchasing Power Parity Theory that explain how foreign exchange volatility affects organizational efficiency, the studies conducted have been inconclusive with both positive and negative relationships being obtained depending on the particular variables investigated (Nyandema and Lagat, 2016). Exchange rate fluctuations, for example, have an effect on businesses that conduct international transactions, such as commercial banks that deal in foreign currencies (Ahmed, 2015). Exchange rates mostly affect those commercial banks that operate mainly with foreign currency and also do transactions beyond the borders (Frank, 2015).

The Exchange rate volatility measures the degree to which the exchange rate fluctuates or varies over a while. The exchange rate is said to be more volatile if there are more frequent ups and downs or less volatile if there are lesser changes in it over some time. There is a real-time fluctuation in the floating exchange rate (Sabri, 2011). Foreign exchange rate fluctuations could be an important source of risk for banking institutions as explained in the above paragraph. Significant foreign exchange losses, in the worst-case scenario, could lead to bank failures while also putting a strain on banks' profitability (Jamal and Khalil, 2011). The direct exposure, which arises from the effects of exchange rate fluctuations on the economy in general and banks' customers in particular, as well as the indirect exposure, which arises from the impacts of exchange rate fluctuations on the economy in general and banks' customers in particular, can be discerned primarily from their accounting reports (Kinyuma , 2013).

This poses a great threat to the commercial banks as they greatly rely on foreign currency exchange in undertaking operations. As such, it is not easy for the banks to forecast future rates with precision and how the financial performance is affected by the exchange rate which is quite volatile. Ethiopia's private commercial banks have a high level of average foreign exchange exposure. This may be due to lack of financial instruments to hedge foreign exchange risk, or due to lack of experience in managing foreign exchange risk.

Now a day's, Ethiopian Private Commercial Banks are required to arrange a banks' loan to an exporter by the National Bank of Ethiopia which demonstrates that banks that perfectly hedge their accounting exposure can still be exposed to substantial foreign exchange risk. Furthermore, the National Bank of Ethiopia (NBE) issued directive no 50/2010 directing commercial banks to

channel all windfall earnings from the selling of foreign currencies to the central bank. This suggests that banks' foreign exchange vulnerability stems from more than just their net foreign asset holdings (Adler, 2004).

Foreign currency Exchange rate movement in Ethiopia especially, USD to ETB has been variable with periods of rapid depreciation of the domestic currency, which adversely affect the Ethiopian economy (Kidist, 2018). Despite the fact that studies on exchange rate regimes and their consequences for macroeconomic management as well as managing foreign exchange risk have been conducted, there has been little research on Ethiopian firms' exposure to exchange risk. It is in this context that this research was able to evaluate the effects that variations in the currencies exchange rate have on the financial performance of the selected private commercial banks in Ethiopia.

1.2 Background of the banks

The agreement between Emperor Minilik II and Mr. Ma Gillivray (a representative of National bank of Egypt which is owned by British) that was reached in 1905 marked the introduction of modern banking in Ethiopia. Emperor Haile Selassie came to power in 1931 and legally replaced Bank of Abyssinia which was inaugurated in February 16, 1906, by Bank of Ethiopia. During the invasion, the Italians established branches of their main Banks namely: Banca d'Italia, Banco di Roma, Banco di Napoli and Banco Nazionale del lavoro and started operation in the main towns of Ethiopia.

Another international bank, Barclays Bank, arrived in Ethiopia in 1941 with British troops and set up banking services in Addis Ababa until 1943. In April 1943, the depository financial institution of Ethiopia commenced full operation and acted because the financial institution of Ethiopia and had an influence to issue bank notes and coins because the agent of the Ministry of Finance. As per proclamation No.207/1955 of October 1963, full-service bank of Ethiopia took over the commercial banking activities of the previous depository financial institution of Ethiopia.

The first privately owned bank, Addis Ababa Bank Share Company, was established on Ethiopian's initiative and began operation in 1964 with a capital of two million. Following the declaration of socialism in 1974, the government expanded its economic authority and

nationalized all major companies. As a result, proclamation No.184 of August 2, 1980 merged Addis Bank S.C and Commercial Bank of Ethiopia to form the country's only full-service bank until the establishment of personal commercial banks in 1994. Accordingly, the Monetary and Banking Proclamation of 1994 created the Ethiopian Commercial Bank as a judicial body independent from the government and outlined its key functions. The legal framework for investment in the banking sector was established by the Monetary and Banking Proclamation No.83/1994 and, as a result, the Licensing and Supervision of Banking Business Proclamation No.84/1994 laid down the legal basis for investment in the banking sector. Currently private commercial banks in Ethiopia around sixteen (NBE, 2019/20, p. 40) in the operation of banking industry, from those banks fourteen banks were selected because the necessity of more investigation information and which have eight years annual report. This study contributes in the existing literature to provide additional evidence for the effect of private banks profitability in Ethiopia.

1.3 Statement of the problem

The role of banks remains central in financing economic activity in general and different segments of the market in particular (Athanasoglou et al, 2008). Greater investments, which increase efficiency, competitiveness, and jobs, are made possible by easier access to finance. Yet, the financial sector is one of the most volatile segments of the economy. Its operation is subject to government tight control, dynamic technological change, and domestic and international competition.

Recent trends in financial deregulation, technological and financial innovation and globalization are surely posing new challenges for market participants in the financial sector (Altunbaset et al., 2001). All these developments will certainly have implications on the effects of foreign currency fluctuation for bank profitability performance of the banking institutions.

Given the relation between the wellbeing of the banking sector and the growth of the economy (Rajan and Zingales, 1998; Levine, 1998), the study of banking sector on the effects of foreign currency fluctuation on bank profitability performance is of great prominence in developing economies.

Profitability of the banks related to foreign currency indicates the success of the management and it is one of the most important performance indicators for the investors. Profitability changes lead to economic growth because profits affect company spending and savings decisions. This is because a rise in profits improves the cash flow position of companies and offers greater flexibility in the source of finance for corporate investments. As such, an understanding of foreign currency fluctuation and its effects on bank profitability is essential and pivotal to the stability of the economy because the well-being of the rise of FCY earning and reached of the banking sector is very critical to the welfare of the economy at large for our country.

The identification of foreign currency fluctuation and its effects for bank' profitability is important due to the banks' role in the economy. Accounting comparisons should be valid due to banks' highly controlled existence. Furthermore, given the importance of the global financial system to all businesses, it is beneficial to understand how foreign currency fluctuations affect bank efficiency (Ling, Fayman and Michael, 2014).

A basic measure of bank profitability is the return on asset (ROA) which corrects for the size of the bank. It is true that ROA provides useful and necessary information on bank profitability but this is not on the major interest of the bank's owners (equity holders). They are more concerned with the amount of profit the bank makes from their equity investment, which is determined by the return on equity (ROE), or net profits per unit of equity capital (Mishkin Frederic et al., 2009). As highlighted by Athanasoglou et al. (2008) and Sufian (2011), many scholars suggest that ROA is the key ratio for the evaluation of bank profitability given that ROA is not distorted by high equity multipliers, while ROE indifference the risks related with high leverage and financial leverage. As a result, like most of the aforementioned researchers, this study aims to calculate profitability using ROA. Similar to Olweny and Shipho (2011), ROA is calculated as net profit before taxes divided by the average of total assets.

Similar best studies include those conducted on the impact of exchange rate on bank profitability from Ethiopian was by Tadesse Getachew (2015) before 5 year and Kidist Eshetu (2018) both are focused on the exchange rate and on one currency (USD) but this paper was focused on the currencies and using one more foreign currency to examine their effects on bank profitability and also no one was still determine in their study which foreign currency fluctuation more affects profitability cases on Ethiopian banking sector. This clearly shows the lack of sufficient and

strong empirical work on the effects of foreign currency fluctuation for bank profitability in Ethiopia. Motivation for taking banks as focus of the study is that, bank profitability is important because of its effect on the performance of the whole economy. Good performance of banks facilitates economic development by making the FYC earning-investment process more smooth, efficient, and easier to reach.

Therefore, this study tries to close an important gap in the existing literature by trying to determine the relationship that existed between the variables; especially it determines the existed relationship between foreign currencies with banks profitability.

1.4 Objectives

1.4.1 Main objective

The main objective of this study is investigating the effects of foreign currency fluctuation on profitability of Ethiopian private commercial banks.

1.4.2 Specific objectives

Specific objectives of the study include;

- To examine the trend in foreign currency fluctuation;
- To investigate the effect of foreign currency fluctuation in terms of USD on bank profitability; and
- To study the effect of foreign currency fluctuation in terms SEK on bank profitability.

1.5 Hypothesis of the Study

Hypothesis of the study stand on the theories related to a bank's profitability that has been developed over the years by banking area researchers. The traditional theory of the firm assumes that a firm's objective is simply to maximize profits, and on the basis of this assumption a large number of testable predictions about how profit -maximizing firms will behave, and the resultant performance of the industry, can be derived. The basic objective of this study is to identify how the foreign currency (USD and SEK) fluctuation affected bank profitability. The effects other variables which determinants of bank profitability are analyze by including in the estimation regression model as control variables. The variables include in the model are; capital adequacy, Branch number, Inflation and GDP growth are specified based on theories and past empirical

studies related to a bank's profitability. In literature these variables are usually classified as internal and external factors (Tadesse Getachew, 2015).

H1: USD exchange rate fluctuation has statistically significant positive effect on bank profitability;

H2: SEK exchange rate fluctuation has statistically insignificant negative effect on bank profitability;

H3: Capital adequacy has statistically significant positive effect on bank profitability;

H4: Number of bank branches has statistically significant negative effect on bank profitability;

H5: The Inflation rate has statistically insignificant positive effect on bank profitability and

H6: GDP has statistically insignificant positive effect on bank profitability

1.6 Significance of the Study

This study would be beneficial to several financial service institutions, specifically to Managers of banks, the Government of Ethiopia, academicians, and researchers.

This study will provide information to guide their management decisions following the changes in the exchange rate in Ethiopia for strong banking industry. It would equip them with the necessary knowledge for taking the necessary action to protect the performance of their organizations.

For the Government of Ethiopia, the findings of this study would inform the formulation of policies and regulations for strong and resilient banking industry. The findings of this study would inform the fragile foreign currency reserves making it difficult for the banking industry to transact freely.

For future academicians and researchers, the findings of this study would be important in providing material for their reference besides suggesting areas for further research. Future scholars would find this study important because it would identify areas for further studies which future scholars can study.

1.7 Scope of the Study

The target of population is all operating private commercial banks of the country. This study limit fourteen private commercial banks found in Ethiopia namely Awash International Bank

S.C, Dashen Bank S.C, Abyssinia Bank S.C, Nib International Bank S.C, Hibret Bank S.C, Wegagen Bank S.C, Cooperative Bank of Oromia, Lion Bank, Zemen Bank, Oromia international Bank, Buna international Bank, Berhan Bank, Abay Bank and Addis Bank. Those were registered by NBE before 2004/00 E.C and having more than eight-year consecutive annual statement the remaining two banks (Dejub global bank and Enat international bank) has only six years annual statement. The research were depend on two guidelines (recommendations) concerning uses to limit the number of sample size require for the study regression.

The first author were Stevens (1996, p. 117) recommended that ‘for social science research, about 15 subjects per predictor are needed for a reliable equation’. According to the Stevens guidelines the study has six predictors and the minimum required were $15 * 6 = 90$ observations. But, this study has reached more 112 observations. Secondly, Tabachnick and Fidell (2001, p. 117) give a formula for calculating sample size requirements, $N > 50 + 8m$ (where $m =$ number of independent variables) accordingly this study also needed minimum requirement: $50 + 8 * 6 = 98$ on the stand of this base this study were enough to succeed to data analysis.

To this end, the study will use the balanced panel data of eight years ranging between 2012/13 and 2019/20. This sample period is selected because of the availability data and some of banks (for instance: bank of Abyssinia, Buna international bank and Hibret bank) has not greater than eight years annual financial reports, this limits the selected sample period to be eight years.

The study excludes the Government commercial banks because they cannot competitively size with private commercial banks and size of the bank as determinants of profitability (Return on Asset) of private commercial banks between the above mentioned periods. The data required for defining those variables were reviewed from the balance sheet and income and loss statements of each commercial bank and macroeconomic data were reviewed from National Bank annual reports.

1.8 Limitation of the Study

A study on the effect of foreign currency fluctuation on profitability of private commercial banks in Ethiopia needs wider coverage in terms of countrywide examination of all factors deemed necessary. The study uses a quantitative approach and secondary data and also uses balanced panel data for regress the data under fixed effect model. Consequently, the study lacks rich

qualitative data that triangulate and further explain the quantitative findings. Furthermore, the study was limited to the eight years selected sample periods. This is due to the unavailability of data beyond eight years. Despite the limitations, a compressive study was conducted leading to the achievement of the research objective.

1.9 Structure of the study

The research report contains five chapters. The first chapter consists of back ground of the study, the back ground of organization, statement of the problem, objective of the study, significance of the study, scope of the study and limitation of the study. The second chapter consists of literature review. The third chapter consists of the research design and methodology. The fourth chapter consists of data present findings, analysis and interpretation of results. The fifth and final chapter deals with the brief summary, conclusion and recommendation.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature reviewed to provide a basis for the study and the concepts. Besides, the chapter highlights theories guiding the study, determinants of financial performance, empirical studies thereby illustrating the research gap after which it presents the summary of the empirical literature.

2.1 Theoretical Framework

The theoretical framework constitutes the philosophical basis upon which the research is conducted. This forms a link between the theoretical aspects and practical aspects of the variables under study. This study adopted two main theories in explaining the relationship that exists between foreign exchange fluctuations and financial performance. This includes; Purchasing Power Parity Theory and the International Fisher Effect.

2.1.1 Purchasing Power Parity Theory

The effect of the decline in oil prices on the region's oil-importing countries has been smaller than expected, as many of these economies export other non-renewable resources whose prices have also dropped (ibid). The projected growth of economies around the globe has a favourable impact on the export of goods and the level of employment and migration, which are the basic sources of foreign currency.

Purchasing Power Parity theory was proposed by Gustav Cassel in 1918. The theory states that homogeneous goods in different countries cost the same in the very same countries when measured in terms of the same currency (Majok, 2015). The theory assumes that importers' and exporters' actions are motivated by the differences in prices and induce the spot exchange rates. The theory assumes that there are no transactional costs or any barriers to the trade with the commodities traded being homogeneous. However, the main limitation of this belief is in measuring Purchasing Power Parity constructed from price indexes given that different countries use different goods to determine their price level (Reid, 2005). The theory's proposition to the study is that the exchange rate values are affected largely by transactions undertaken in the

foreign exchange market. This shows that equilibrium will only be attained when the purchasing powers are in equilibrium. The theory suggests that the use of price indexes in determining the exact price of a similar product between countries.

2.1.2 The International Fisher Effect

The International Fisher Effect of macro-economic variables was introduced and developed by Irving Fisher in the 1930s who was an economist. According to Fisher, countries have different inflation rates and this causes a similar variation in economic development as well as returns (Ross, 2008). The theory holds that relatively high-interest rates in foreign currencies tend to depreciate due to the expected inflation brought about by the high nominal interest rates (Madura, 2012). Despite the theory having limitations in predicting the short-run variations in exchange rates, it helps in understanding the exact interrelation between inflation, and both the real and nominal interest rates.

The theory helps in understanding why exactly inflation may not have a significant impact on the real interest in the long term (Nyandema and Lagat, 2016). The proposition is that the changes in exchange rates experienced in countries will also tend to rule out any differences that may be obtained as a result of having varying interest rates (Demirag and Goddard, 1994). This theory is relevant for this study as it explains the purchasing power of each currency which captures the inflation across countries to ensure that at equilibrium exchange rates, the basket of goods and services purchased by one unit of a country's currency equals those purchased in the second country.

2.2 Overview of the Exchange rate regime in Ethiopia

The way a nation regulates its currency in relation to foreign currencies and the foreign exchange market is referred to as its exchange rate regime. It is intertwined with monetary policy, and both are influenced by several of the same factors. There are different forms of exchange rate regimes used by countries, as stated in the NBE policy framework (2009, P. 15). Floating, pegged floating, and fixed exchange rate regimes are the most common.

Floating exchange rate: today, the most prevalent exchange rate regime. These regimes are also referred to as managed float or dirty float because central banks often intervene to prevent excessive appreciation or depreciation.

Pegged Floating Exchange Rate: In this case, the currency is tied to a fixed or regularly changed band or value. Pegged floats are:

- **Crawling bands:** the rate is permitted to vary in a band around a central value that is changed on a regular basis. This is achieved at a set pace or in a regulated manner in response to economic indicators.
- **Crawling pegs:** Here, the rate itself is fixed, and modified as described above.
- **Pegged with horizontal bands:** The currency is allowed to fluctuate in a fixed band (bigger than 1%) around a central rate.

Fixed Exchange Rates: Fixed exchange rates are those that can be converted directly into another currency. The domestic currency is backed one to one by foreign reserves in the case of a different currency, also known as a currency board arrangement. This group includes pegged currencies with very limited bands (1%) (NBE policy frame work, 2009). The overall pressure in the foreign exchange market is expressed in observed adjustments in the exchange rate in a free-floating exchange rate system. In a fixed exchange rate regime, foreign exchange market conditions are totally captured by changes in reserves. However, in mixed exchange rate systems, such as regulated floating, a change in the exchange rate absorbs some of the pressure while changes in reserves absorb the rest. In such cases, neither reserve shifts nor exchange rate movements accurately represent the magnitude or existence of the exchange market disequilibrium (Abebe, 2006).

The choice of exchange rate regime is determined by various factors, such as the objective pursued by the policy makers, the sources of shocks hitting the economy and the structural characteristics of the economy. The authorities are expected to modify their macroeconomic policies (especially fiscal and monetary policies) to suit the chosen exchange rate regime once the decision is made (Abebe, 2006).

Many central banks engage in "controlled floating," in which they participate in the foreign exchange market by "bending against the tide." To do so, a central bank sells foreign exchange when the rate is rising, dampening its rise, and buys when the rate is falling. The motive is to reduce the variability in the exchange rate (Jeffrey, 2008).

Different exchange rate strategies are pursued by countries to ensure that the exchange rate regimes they have adopted are working properly. The term "exchange rate strategy" refers to the monetary authorities' systematic attempt to manipulate the exchange rate's level or rate of change. Foreign exchange market interference, domestic monetary policy, different types of controls on international trade and capital flows, and official announcements of future policies are all possible policy tools for influencing the exchange rate (Glick and Hutchison, 1989).

Different regimes have governed Ethiopia's exchange rate policy. Prior to 1992, the country operated under a fixed exchange rate system, in which the rate was set solely by the government. Since 1992, the country has followed a regulated floating exchange rate strategy, in which the government intervenes when required to keep the foreign exchange market stable (Nega, 2015).

Nega (2015) cited the work of Lencho (2013), who noted that the National Bank has taken a number of steps following the big devaluation of 1992, which occurred in an attempt to liberalize the foreign exchange market. As a result, on May 1, 1993, the fortnightly foreign exchange auction market was launched with two rates: the Dutch auction system (official rate) and the marginal pricing auction system (marginal rate). This transition was made as part of a broader macroeconomic adjustment program aimed at achieving a market-determined exchange rate, bettering foreign exchange distribution, and moving illegal to official transactions (Aron, 1998). In 2001, the auction scheme was phased out in favour of the regular interbank foreign exchange market. As a result, demand and supply considerations in the calculation of the exchange rate were given more leeway. The national bank of Ethiopia, on the other hand, will primarily handle the exchange rate pressure through reserve requirements. Ethiopia follows a regulated floating exchange rate system as a result.

In the management of foreign exchange rates, monitoring policy plays an important role. The National Bank of Ethiopia is responsible for monetary policy formulation and execution in Ethiopia (NBE). Maintaining price and stability of exchange rate, and supporting sustainable economic growth is the main objective of the monetary policy of the National Bank of Ethiopia. NBE considered maintaining exchange rate stability as the primary policy in order to be competitive in the international trade as well as to use exchange rate intervention as policy tools for monetary policy. This can help the bank to affect foreign reserve position and domestic money supply. On July 23, 1945, the official exchange rate of 2.48 Birr per US dollar was

created and unchanged till 1964. Then Birr devaluated to 2.50 per USD (Nega, 2015). After that, ETB was devalued to 2.30 per USD in 1971. Finally, Birr had been pegged to the US Dollar at a constant exchange rate, \$1= 2.07Birr till the significant devaluation was taken by the transitional government of Ethiopia in 1992, when it was devaluated by 58.6% (i.e., from 2.07 to 5 birr per USD). As was discussed above, the devaluation of 1992 was accompanied by the change of exchange rate regime from fixed to a managed floating exchange rate regime and after that, Ethiopian currency has experienced a depreciating trend. During the past decade, Ethiopian birr has been significantly depreciated against major foreign currencies (USD, GBP and Euro). For example, the exchange rate of ETB to USD has depreciated from 16.99:1 in 2010/2011 to 35.16:1 in 2019/2020 (NBE, 2020).

Abebe (2006) found that the majority of the time (42 months out of the 49 months studied) the Ethiopian exchange market was characterized by depreciation pressure in his analysis of an index of exchange market pressure (EMP) for Ethiopia from November 2001 to December 2005. This depreciating trend of the home currency may affect the economic performance of different sectors and as a result, the performance of commercial banks might also be indirectly affected. Generally, the variation in rate of exchange could result from demand and provide pressure and/or policy decision of the country. Once occurred, variation in rate of exchange may affect variety of macroeconomic factors and industries, particularly the banking system. Exchange rate fluctuations, as previously mentioned, have an effect on bank efficiency. In addition to the change in exchange rate could also indirectly affect the profitability of commercial banks. Because of this direct and indirect effect of exchange rate on the banks profitability, it is not possible to easily determine the direction and magnitude of the general impact of variation of the rate of exchange on the profitability of banks.

2.3 Determinants of banks profitability

The financial performance of commercial banks is an integral tool in evaluating their profitability, sustainability, and dominance in the market. Different banks have been established to have varying returns despite them providing similar products and services for the same market segment. This raises concern on the exact factors, both internally and externally that determine the returns in a particular bank.

2.3.1 Exchange Rate

The value of a local currency against a unit of the foreign currency is termed as the exchange rate. The exchange rate is not fixed as it tends to vary based on the particular currencies and also the particular time or period. Certain currencies will have a higher value than others, but when the value decreases it is termed as to depreciate. Many factors result in changes in the exchange rates and this includes mainly the balance between demand and supply in the foreign market. These changes occur spontaneously and always seem almost difficult to predict. The changes result in the organization's performance to be changed as well. This is however limited largely to those organizations undertaking mainly in international transactions or currencies as the locally based ones will be impacted minimally (Nyandema and Lagat, 2016). As such high exchange rates will make most foreign investors shun making any transactions at that particular time. The banks will be affected in a similar way as depreciation in the local currency will mean reduced transactions such as savings and borrowing resulting in reduced returns.

2.3.2 The size of the Bank

The size of the bank also plays a role in how the banks will not only perform but also in attaining dominance in the banking industry (Ahmed, Ahmed & Ahmed, 2010). From the previous studies there are mixed results. Humphrey and Berger (1997), European commission (1997) Big banks are achieved more of economies scale. But, on other hand Vander (1998) found evidence for larger banks of diseconomies and economies of scale for small banks. Kosmidou (2006) Banks profit negative related with Bank size in his investigating of the research on UK owned commercial banks. Those well documented literatures were use total asset banks' as a proxy for its size to account for size related economies or diseconomies of scale.

2.3.3 Inflation Rates

Inflation is the rate at which the overall price of goods and services within an economy increases over a certain period of time. It is a measure for the devaluation of the currency of a country. There are two main price indexes that measure inflation:

- 1. CPI (consumer Price Index):** A measure of price changes in consumer goods and services such as gasoline, food, clothing and automobiles. The CPI measures price change from the perspective of the purchaser.

2. **PPI (producer produce indexes):** A family of indexes that measure the average change over time in selling prices by domestic producers of goods and services. PPIs measure price change from the perspective of the seller.

2.3.4 GDP (Gross Domestic Product)

The performance of the country's economy can affect the profitability of banks. The effect of exchange rate on the economy in general could therefore affect the bank performance.

Different studies assessed the relation between exchange rate and economy. For example, Charles (2006) showed that exchange rate is one of the most important economic adjustment instruments and one of the most difficult and controversial economic policy tools. The study argues that a depreciation of the exchange rate only offer protection to domestic industry when the domestic cost of production increases much less than the rate of depreciation, while prices of imported equivalent increases by the full amount of the depreciation.

Obadan (2006) put forward an argument that the exchange rate plays a role in connecting the price system in different countries thus enabling traders to compare price directly.

Changes in exchange rate have a powerful effect on imports and exports of the countries through effects on relative prices of goods.

Agu (2002) as cited in Adesola and Taiwo (2013) shows that optimal exchange rate policies must be aimed at cooling real exchange rate (RER) that maintain internal and external balance in an economy. Internal balance here is defined in terms of the level of economic activities consistent with satisfactory control of inflation and full employment of resources. External balance on the other hand is defined in term of payment equilibrium, sustainable current account deficit finance in a lasting basis of expected capital flow. Any distribution in the real exchange rate will mostly probably lead to instability in both external and internal balance. Generally, exchange rate has critical influence on the import and export business, maintaining internal and external balance in an economy and viewed as an instrument for economic adjustment.

2.4 Empirical Literature Review

A number of academic studies have addressed banks and foreign exchange exposure. For example, Bracker et al (2009) identified the change in the value of the U.S. dollar as one of the six primary sources of bank risks. Bracker's study focus on the sensitivity of bank stock returns to various risk factors. The findings were not consistent however with some time periods

generating positive relationships and other generating negative relationships between bank holding company returns and exchange rates. However, their study did identify foreign exchange risk as significant. Owing to the importance that exchange rates have to a particular economy, many studies have been conducted both locally and internationally trying to establish its impact on organizations. Adetayo (2013) examined how commercial banks manage the risks that are posed by the foreign exchanges in selected commercial banks in Nigeria. The study sought to determine how the risk involved in foreign exchange can be effectively managed. The study exploited both the primary and secondary sources of information. The study determined that the spot transaction technique was effective in minimizing foreign exchange risk. The study however was not able to determine the relationship that existed between the variables.

Addae, Nyarko-Baas, and Tetteh (2014) examined the effect of exchange rate fluctuations on Ghanaian banks. The study investigated the sensitivity to exchange rates in the commercial banks found in the Ghana Stock Exchange for over five years. The findings showed that the banks had various risk management strategies. This thus shows that risk management was an integral part of these organizations. The study was however concentrated mainly in Ghana and thus may not be applied locally in Ethiopia.

Manyo et al (2016) conducted a study on foreign exchange transactions in selected commercial banks in Nigeria. The study employed data generated from the yearly reports published by the commercial banks. To test for the properties of panel data, Breitung (2000), the test was deployed. Based on the popularity of the result, the study concluded that the variables had integration values. The result of the Kao panel co-integration test indicates that there exists a long-run relationship between the variables under study. The study was however inconclusive on the exact relationship type that existed.

Irene (2011) conducted a study on the impact exchange rates have on airline performance. The study employed a casual case study approach to determine the relationship that existed between the variables. The population was the employees in the airline sampled by simple random sampling. The study found out that there is a negative relationship between foreign exchange risk and performance of the Airlines of Kenya Airways. The study was however on Airlines which have different modes of operations as compared to the commercial banks.

Gachua (2011) conducted a study on the listed companies at the NSE. The study conducted proportional sampling to obtain a sample of 32 firms mostly in the finance sector. Descriptive statistics and inferential analysis adopted by the study. The study found that the companies paid close attention to the changes in the foreign exchange as they were being recorded in the account's books. The study did not however determine the relationship that existed among the variables.

Ahmed (2015) investigated the impact that foreign exchange risk exposure has on commercial banks' performance. The study established changes in the rates had minimal to no risk at all to the banks, as they had placed mechanisms to counter the foreign exchange risks. The study only focused on interest rates and inflation without considering other macroeconomic variables. Additionally, the study was not able to establish a relationship that existed between the variables.

Majok (2015) investigated exchange rate fluctuations in commercial banks in Kenya. The study used a descriptive research survey. The secondary data was collected from the banks' consolidated financial statements as well as the Central Bank of Kenya offices. The study found that there was a positive relationship between foreign exchange rate fluctuations and the financial performance of banks as measured by the returns on assets ratio. The study did not consider other macro-economic variables such as inflation rate.

2.5 Conceptual Framework

The relationship between the study variables is presented in the conceptual framework presented in Figure 2.1. Foreign currencies (USD and SEK) exchange rate fluctuations, Capital Adequacy rate, Branch number, Inflation rate and GDP will be the independent variable while the dependent variable will be the commercial banks' performance (ROA).

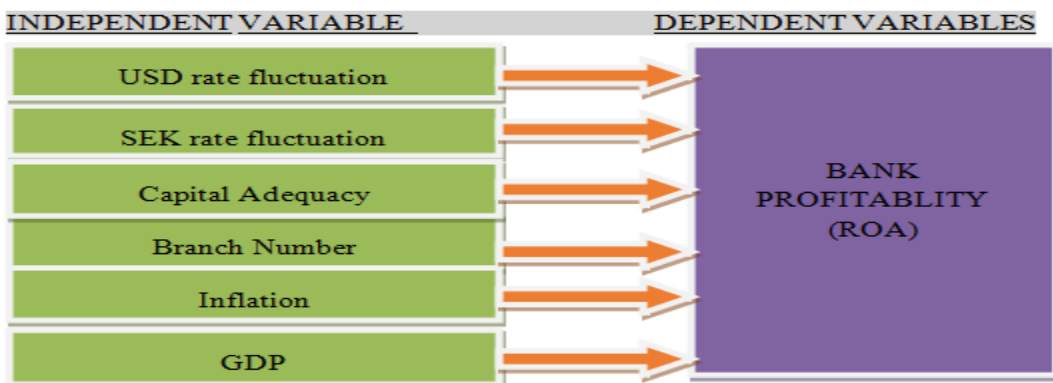


Figure 2-1 Conceptual Framework (source; research survey 2021)

2.6 Summary of Literature Review and Research gap

The correlation between foreign exchange and the banking sector profitability is a current issue in literature and has remained of interest among researchers, economists, and policymakers alike. This chapter has reviewed the literature relevant to the study. It specifically reviewed the theories guiding the study including the purchasing power parity and the international Fischer effect which all tend to provide a theoretical approach in understanding how exactly organizations may get affected by foreign exchange rates.

The study further reviewed empirical studies conducted from international perspectives trying to determine the relationship that existed between the variables. The results obtained from the study have shown that changes in the foreign exchange rates in a particular country may impact both positively and negatively on the organizations. Though quite a several studies have been carried out over the subject matter, there is still no consensus on the effects that exchange rates have on the financial performance of organizations. The studies conducted focus more on other aspects of foreign currency exchange rate fluctuations such as economic impact and not the performance of organizations.

Similarly, other studies conducted have established that no significant influence exists and relates the performance of organizations to other factors other than the exchange rates. Therefore, there is a research gap as far as the impact that foreign currency exchange rate has on the financial performance by banks is concerned. It is from the above backdrop that this study sought to examine the effect of foreign exchange currency rate on the performance of the banking sector in Ethiopia.

CHAPTER THREE

3 RESEARCH DESIGN AND METHODOLOGY

3.1 Type and Source of Data

The types of data that used in this study were balanced panel data and Quantitative in nature. Balanced panel data meaning that each cross-sectional unit has same number of time series observations. The secondary data were collected from annual reports of each sampled banks to conduct this study. Therefore, the main secondary data of the study were financial statements of the respective banks and Macroeconomic data which were gathered from National bank of Ethiopia (NBE).

3.1.1 Methods of Sampling

The study utilized Purposive Ownership structure (only private commercial banks are included in the study) and Time establishment (only banks' who have above eight years' experiences in the banking operations included). This indicates reasonable time is necessary to look changes in the business of banking. From total sixteen fully operating private commercial banks of Ethiopia the study cover fourteen (87.5%) private Ethiopian commercial banks.

3.1.2 Method of data Analysis

The experience of studies conducted in other countries (as shown in literature review section), the study uses both descriptive statistics tools and fixed effect econometric tool to analyze the collected data. Basically, descriptive statistical tools were used to analyze the mean, standard deviation, minimum and maximum values. On the other hand, an Econometric tool particularly fixed effect model assisted the research to verify causes of changes within banks of the study matter beyond descriptive statistical tools.

3.2 Model specification

The fixed effect econometric model is specified to measure how foreign currency fluctuation affected the Ethiopian private commercial banks profitability. Accordingly, the econometric model indicated by equation (1) is developed to measure the effect of foreign currency fluctuation on the profitability of Ethiopian commercial banks. The bank profitability (dependent variable) is represented by return on Asset (ROA) which is calculated by net profit before tax

divided by average of total assets. This model is further adjusted to include control variables as indicated by equation (2).

Model specified to measure the effect of foreign currency fluctuation on ROA

$$ROA_{it} = \beta_o + \beta_{it}FYC + \varepsilon_{it} \text{ --- --- --- --- --- (1)}$$

Where;

ROA_{it} = Return on Asset of bank i at time t,

β_o =the constant term,

β_{it} = the coefficients of the explanatory variables,

FCY=the fluctuation of foreign currencies to ETB at time t,

ε_{it} = the error term.

Since there are other factors that could influence the profitability of banks, failure to include some of these critical factors to the model may result in exaggerated estimates of the changes in the bank return on asset (ROA) attributable to foreign currency fluctuation (USD and SEK). Therefore, model indicated by equation (2) is specified to include key control variables that could affect bank's profitability (ROA). The control variables included in the model are Capital Adequacy rate, Branch number, Inflation rate and GDP growth. Despite not only those independent variables are determining the effect of bank profitability, there are other bank specific and macroeconomic variables that influence banks profitability. But, regarding to this study because the main objective of the study were to investigate the impact of foreign currencies on banks profitability and the variables were as a control variable so that the only above independent variables are include in the study and also considering of timeframe to finish the research is limit to address other independent variables.

$$ROA_{it} = \beta_o + \beta_{it}USD + \beta_{it}SEK + \beta_{it}CAAQ + \beta_{it}BN + \beta_{it}INF + \beta_{it}GDP + \varepsilon_{it} \dots \dots \dots (2)$$

Where;

ROA_{it} = the Return on Asset of banks i at time t.

$\beta_{it}USD$ = exchange rate of USD to Birr assigned to bank i at time t.

$\beta_{it}SEK$ = exchange rate of SEK to Birr assigned to bank i at time t.

$\beta_{it}CAAQ$ = Capital Adequacy for the bank i at time t.

$\beta_{it}BN$ = Bank Branch Number for the bank i at time t.

$\beta_{it}INF$ = Inflation rate at time t.

GDP=Growth domestic production at time t.

ε_{it} = Error term

The impact of each of the explanatory variables on the profitability of Ethiopian commercial banks is assessed using the above multivariate regression equation by using the statistical significance of the coefficients (β_i).

3.3 Measurement of Study Variables

Table 3-1 Measurement of variables

Notations	Variables	Operational Definitions
ROA	Return ON Asset	Net income before tax / Total Asset
USD	USA Dollar Fluctuation	Annual weighted average rate of USD
SEK	Swedish Kroner Fluctuation	Annual weighted average rate of SEK
GDP	Gross Domestic Product	Real GDP growth rate of the country
INF	Inflation Rate	Annual Inflation Rate of the country
CAAQ	Capital Adequacy Rate	Total Capital / Total Asset
NBB	Number of Bank Branches	Number of Bank Branch at time t

CHAPTER FOUR

4 DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This section of the study presents the descriptive statistics of the dependent variables and explanatory variables included in the study. As already mentioned, return on asset (ROA) is the dependent variable used to measure bank profitability in the model specified to determine the effects of foreign currency fluctuation on the profitability of private commercial banks in Ethiopia.

Diagnostic tests of heteroskedasticity, multi-co linearity, and specification test are performed. The data used for this study are secondary data collected from the National Bank of Ethiopia (about macroeconomic variables) and annual financial reports of banks included in the study. It covers eight years' annual data between 2012/13 and 2019/20. First section of the chapter discusses the trend analysis and descriptive statistics. The second section is about discussion of diagnostic test results and the last section is about interpretation of the regression analysis report.

4.2 Descriptive Statistics and Trend Analysis

This section presents the trend analysis of the variables under study between 2012/13 and 2019/20. The statistics applied in the description of the data are mean, standard deviation, maximum and minimum. Furthermore, it explores the historical moves of the financial performance of private banks in Ethiopia (as measured by return on asset) in the study period.

The following figure shows how the trend of foreign currencies for last eight investigated years against home currency (Birr).

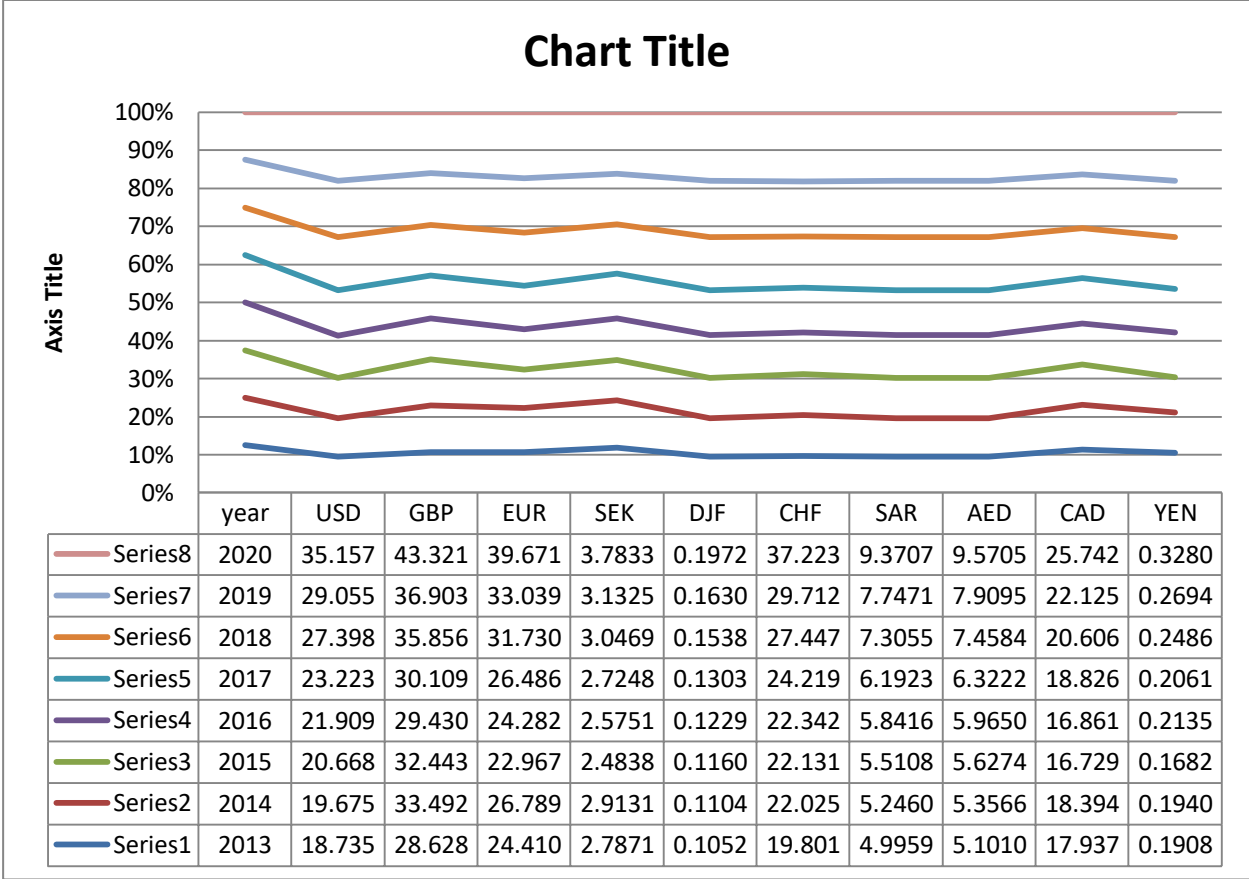


Figure 4-1 the trends of Foreign Currency Fluctuation

According to above figure almost all abroad country currencies trends are appreciation year to year against home currency. So, the following section will describe how this trend was affecting Banks profitability in Ethiopia.

The following Table presents the summary statistics of the variables used to define ROA in this study. It shows the number of observations, means, and standard deviations values of each variable. All the variables have 112 observations. The average values of all variables are positive. See the following table.

4.3 Descriptive statistics for explanatory variables

Table 4-1 Mean, Standard deviation, Minimum and Maximum

. summarize ROA USD SEK GDP INF CAAQ NBB

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	112	.0345618	.0095899	.0034569	.0707767
USD	112	24.47796	5.294458	18.7358	35.1571
SEK	112	2.930825	.3842517	2.4838	3.7833
GDP	112	8.9375	1.452995	6.1	10.4
INF	112	11.4625	3.999395	7.2	19.9
CAAQ	112	.1452114	.034828	.0787149	.259518
NBB	112	176.3036	122.9995	7	579

Source: own estimation of research data (2021)

Exchange rate of ETB to USD: descriptive statistics revealed that the average exchange rate of USD to ETB since 2013 was birr 24.47 with std. devotions 5.29, For the case of SEK, the mean value was 2.93 with std, deviation of 0.38, The mean value of GDP growth rate since 2013 was 8.93 with std deviations of 1.45. For the case of INF, the mean was 11.46 with the standard deviation 3.999, for the case of CAAQ the means of 0.145 with standard deviation of 0.0348 and the mean value of NBB was 176 with standard deviation of 122.999. From the above result the researcher found that, the majority of the banks strongly agreed that received any foreign exchange currency can have contributed for some effects on ROA directly and indirectly to development of Ethiopian community.

This implies that, currency fluctuation in foreign exchange increases or decreases the profitability of bank. Therefore, Ethiopian commercial bank should take into consideration about fluctuation in foreign currency exchange.

4.4 Correlation coefficient

Table 4-2 Correlation coefficient

```
. corr ROA USD SEK GDP INF CAAQ NBB
(obs=112)
```

	ROA	USD	SEK	GDP	INF	CAAQ	NBB
ROA	1.0000						
USD	-0.1380	1.0000					
SEK	-0.0655	0.8773	1.0000				
GDP	0.1589	-0.8250	-0.7392	1.0000			
INF	-0.0707	0.7692	0.8708	-0.8132	1.0000		
CAAQ	0.3839	-0.1885	-0.1083	0.1462	-0.1007	1.0000	
NBB	-0.3040	0.6818	0.5381	-0.5223	0.4323	-0.5418	1.0000

Source: own estimation of research data (2021)

Correlation analysis is used to describe the strength and direction of the linear relationship between two variables and measure of relationship between two continuous variables. Correlation measures both the size and direction of relationships between two variables. The squared correlation is the measure of the strength of the association (Tabachnick and Fidell, 1989). The value of correlation is always in between minus one and plus one (-1 and +1). The sign of the correlation coefficient determines whether the correlation is positive or negative. The magnitude of the correlation coefficient determines the strength of the correlation. Different authors suggest different interpretations; however, Cohen (1988, pp.79-81) suggests the following guidelines:

Table 4-3 Correlation Coefficient Guidelines

Correlation Coefficient(r)	Strength of the correlation
0.50 to 1.0 or -.50 to -.10	Strong relationship
0.30 to .49 or -.30 to -.49	Moderate relationship
0.10 to .29 or -.10 to -.29	Weak relationship

Source: Cohen (1988, pp.79-81)

These guidelines apply whether or not there is a negative sign out the front of your R-value. Remember, the negative sign refers only to the direction of the relationship, not the strength. The strength of correlation of $r=.5$ and $r=-.5$ is the same. It is only in a different direction. From the

above correlation matrix implementation of bank return on asset (ROA) have positive and negative correlation with the entire variables.

4.5 Model Assumptions

4.5.1 Multi-co linearity test

This refers to the relationship among the independent variables. Multi-co linearity exists when the independent variables highly correlated by $r = 0.9$ and above (Julie Pallant, 2005, p 142). According to Pallant rule the two (USD and SEK) foreign currencies were included in the study that SEK has 0.8773 (less than $r < 0.9$) for selected eight investigated years from all below table currencies. From those currencies DJF, SAR and AED was match correlated with USD. The remained GBP (0.9066), EUR (0.9586), CHF (0.9903), CAD (0.9468) and YEN (0.9684) were highly correlated ($r > 0.9$) with USD.

Therefore the study included only USD and SEK to investigate there effects on banks performance. Which those all ten below abroad country currencies are acceptable and use by NBE reports for transaction and/or translation purpose in home country;

Table 4.4: Correlation between currencies

. correlate USD GBP EUR SEK DJF CHF SAR AED CAD YEN
(obs=8)

	USD	GBP	EUR	SEK	DJF	CHF	SAR	AED	CAD	YEN
USD	1.0000									
GBP	0.9066	1.0000								
EUR	0.9586	0.9373	1.0000							
SEK	0.8773	0.9078	0.9690	1.0000						
DJF	1.0000	0.9067	0.9587	0.8775	1.0000					
CHF	0.9903	0.9410	0.9690	0.9118	0.9903	1.0000				
SAR	1.0000	0.9065	0.9586	0.8772	1.0000	0.9902	1.0000			
AED	1.0000	0.9066	0.9586	0.8773	1.0000	0.9903	1.0000	1.0000		
CAD	0.9468	0.9207	0.9905	0.9741	0.9469	0.9640	0.9468	0.9468	1.0000	
YEN	0.9684	0.8750	0.9722	0.9291	0.9684	0.9624	0.9684	0.9684	0.9604	1.0000

Source: own estimation of research data (2021)

Multi-collinearity exists in an OLS multiple regression models when two or more independent variables share a near perfect linear relationship (Fox, 2015). Multi-collinearity can cause values of least squares estimators to be unstable (i.e., subject to change with slight variation in the data) (Fox, 2015). Accordingly, VIF values are examined because they estimate how much of the variance in regression coefficients is inflated due to multi-collinearity (Fox, 2015). A recommended cut-off value for VIFs is 10, where VIFs less than 10 indicate that the model does not suffer from multi-collinearity (Fox, 2015). Accordingly, in this data, there is no multi-collinearity problem because of all the VIFs value are not greater than 10 and less than 0.1 So it is free from multi-collinearity.

Table 4. 5: Multi-collinearity

```
. vif
```

Variable	VIF	1/VIF
USD	8.98	0.111395
SEK	8.73	0.114517
INF	6.51	0.153525
GDP	4.89	0.204661
NBB	2.90	0.344851
CAAQ	1.56	0.639428
Mean VIF	5.60	

Source: own estimation of research data (2021)

4.5.2 Test for Heteroskedasticity

One of the CLRM assumptions says that the variance of the errors is constant. This is known as the assumption of homoskedasticity. If the errors do not have a constant variance, they are said to be heteroskedastic (Brooks, 2008, p 132). The presence of heteroskedasticity makes the standard errors wrong and hence any inferences made could be misleading. This requires validation of the null hypothesis that the error terms are homoskedastic. It has been assumed that the variance of the errors is constant. This is known as the assumption of homoskedasticity. If the errors do not have a constant variance, they are said to be Heteroskedasticity. The Breuch-Pagan test is applied to check for the presence of heteroskedasticity in the residuals. As shown in Table 4.6 both chi-square test and the probability gave the conclusion that there is no evidence for the presence of heteroskedasticity since the p-values is 5%. As the result shown in the below table shows, the null hypothesis (HO) of $\text{prob} > \chi^2 = 0.0162$ which is less than 0.05. This means there is no heteroskedasticity problem on the data collected from the banks.

Test for Heteroskedasticity Breuch-pagan

Table 4.6: Heteroskedasticity

```
. hetttest

Breusch-Pagan / Cook-Weisberg test for heteroskedastic
> ity

      Ho: Constant variance
      Variables: fitted values of ROA

      chi2(1)          =          5.78
      Prob > chi2      =          0.0162
```

Source: own estimation of research data (2021)

The study employed White's General Heteroskedasticity to ensure that this assumption is no longer violated. Brooks (2008) recommended that the null hypothesis of homoskedasticity would not be rejected if the p value of the F- and χ^2 ('LM') versions of the test statistic and the p-value of the Scaled Explained SS is higher than 0.05. As it can be seen on appendix 5, the P value of these two test statistics is higher than the mentioned threshold (0.05), hence the null hypothesis of homoskedasticity would not be rejected. The probability value is greater than >5% hence we cannot reject the null hypothesis. HO: there is no heteroskedasticity and our data also free from heteroskedasticity

4.5.3 Normality Test

A normal distribution is not skewed and is defined to have a kurtosis coefficient of 3. Jarque-Bera formalizes this by testing the residuals for normality and testing whether the coefficient of Skewness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how far the tails of the distribution are. The Jarque-Bera probability statistics/p-value is also expected not to be significant even at 5% significant level. Hence, the result found from normality test procedure using Jarque-Bera Statistic confirms that the error terms are distributed normally.

Table 4. 7: Normality

. sktest myresiduals

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
myresiduals	112	0.6996	0.1551	2.22	0.3296

Source: own estimation of research data (2021)

The findings as shown by Table 4.6 reveal that skewness of 0.6996 and kurtosis of 0.1551 all dependent variables were well distributed as their skewness value were falling between +/-1 to +/-1 and their kurtosis values were around 0, +2 and -2.

Hausman Test

“The Hausman test (1978) widely used in applied research to test the endogeneity of explanatory variables in a regression. The Hausman test is based on looking for a statistically difference between an efficient estimator under the alternative hypothesis that misspecification is presented” (R. Carter Hill and Viera C, 2004). Perform Hausman (1978) specification test; if p-value of the test is > 0.05, we accept null hypothesis and fixed effect model is consistent and efficient. If p-value of the test is <0.05, we reject the null hypothesis and random effect model is preferred and consistent. The Hausman test used to differentiate between fixed effect model and random effect model in panel analysis.

Table 4-8 Hausman test

```
. hausman FIXED .
```

Note: the rank of the differenced variance matrix (5) does not equal the number of coefficients being tested (6); be sure this is what you expect, or there may be problems computing the test. Examine the output of your estimators for anything unexpected and possibly consider scaling your variables so that the coefficients are on a similar scale.

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) FIXED	(B) RANDOM		
USD	.0011168	.0001788	.0009381	.0003611
SEK	-.0025924	.0016638	-.0042561	.
GDP	.0016508	.001442	.0002087	.
INF	.0001149	.0001865	-.0000716	.
CAAQ	.206876	.0878916	.1189844	.0459826
NBB	-.0000403	-.0000131	-.0000272	.0000147

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(5) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
          = 8.47
Prob>chi2 = 0.1324
(V_b-V_B is not positive definite)
```

Source: own estimation of research data (2021)

The Housman probability value χ^2 is 0.1324 > (more than) 5% we select fixed effect model is the most appropriate model for our analysis. So, we cannot reject the null hypothesis (Ho). The fixed effect model is better than random effect model so we use fixed effect model for analysis.

4.6 Results of Regression Analysis and its Interpretation

Given results of the diagnostic tests, this is the relationship between explanatory and explained variables. The regression analysis result affirmed statistical significance (at 5% level of significance) the currency USD in the model. It's the number of bank branches which is found to be significant at 5% level of significance. The direction of relationship between the dependent and independent variables is consistent with the hypothesis and findings of other researchers. To optimize the power of the test, the conclusions of this analysis is based on 5% significance level.

Fixed effect

Table 4-9 Fixed effect

```
. xtreg ROA USD SEK GDP INF CAAQ NBB, fe
```

```
Fixed-effects (within) regression      Number of obs      =      112
Group variable: code                  Number of groups   =      14

R-sq:                                 Obs per group:
    within = 0.2113                    min =              8
    between = 0.3694                   avg =             8.0
    overall = 0.1591                   max =              8

                                F(6,92)              =      4.11
corr(u_i, Xb) = -0.8206                Prob > F            =      0.0011
```

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
USD	.0011168	.0006028	1.85	0.067	-.0000805	.0023141
SEK	-.0025924	.0064207	-0.40	0.687	-.0153444	.0101597
GDP	.0016508	.0012369	1.33	0.185	-.0008058	.0041073
INF	.0001149	.0005224	0.22	0.826	-.0009226	.0011525
CAAQ	.206876	.0564113	3.67	0.000	.0948383	.3189137
NBB	-.0000403	.0000193	-2.08	0.040	-.0000787	-1.90e-06
_cons	-.0241868	.0190808	-1.27	0.208	-.062083	.0137093
sigma_u	.00739966					
sigma_e	.00854953					
rho	.4282775	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(13, 92) = 1.78                      Prob > F = 0.0574
```

Source: own estimation of research data (2021)

In the above table, the p-value denotes the results of hypothesis tests of the independent variables' slopes. In these tests, the null hypothesis states that the slope of the independent variable is no different than zero (implying it has no effect on predicting the dependent variable). Thus, regression coefficients with p-values less than 5% are significant predictors of the dependent variable. Hence according to the result of above table shows, CAAQ is statistically significant (0.000) at 1% significant level, NBB is statistically significant (0.04) at 5% significant level and USD is statistically significant (0.067) at 10% significant level. But, all

others independent variables are statistically insignificant and have positive and negative impact on ROA.

The regression analysis result shows that there is significant and positive relationship between USA dollar fluctuation (USD) and return on asset (ROA) of Private Banks in Ethiopia at the 10% significance level. Kidist Eshetu Tufa (2018) found the same result of regression analysis the Exchange rate has statistically significant positive impact on the financial performance of private commercial banks in Ethiopian relation to ROA. The coefficient 0.0011 tells us that a 1-birr change in the exchange rate at any point in time, where the change is believed to remain in effect for a reasonable time period, will result in 0.0011 unit increases in the return on asset of a bank. In other words, since the financial performance of a bank is measured in return on asset, a one-birr increase in the USD will enable a bank to earn additional profit of at least 0.11% of its asset as profit, keeping the effect of other variables constant. On other hand, there is insignificant and negative relationship between Swedish kroner (SEK) and return on asset (ROA) of Private Banks in Ethiopia even at the 10% significance level. Keeping the effect of other variables constant, the coefficient 0.0025 implies that a one-birr change in the SEK leads to at least 0.25% ↓ change in return on asset.

The regression analysis result also shows that there is insignificant and positive relationship between growth domestic product (GDP) and return on asset (ROA) of Private Banks in Ethiopia even at 10% significance level. The coefficient 0.0016 implies that a one-birr change in the growth rate of gross domestic product leads to 0.16% change in return on asset keeping the effect of other variables constant.

Inflation refers to changes in the price level in an economy. The general inflation rate peroxide by yearly rate of change of the consumer price index has been also insignificant at also higher significant level and the coefficient having a positive sign. High inflation is expected to result in the non-normalization of prices in the economy which in turn result in high costs of doing business. Higher costs are expected to result in higher margin which means. These extra costs of operations are then passed on to the customers by increasing the margins of lending rates to preserve purchasing power. In the Ethiopian commercial banks, inflation has estimated coefficient of 0.0001 in the return on asset regression, which means that a unit increase in the

level of inflation results in a 0.0001-unit increase in return on asset. The impact of inflation was able to explain why bank financial performance is improving or declining in Ethiopia.

There is significant positive relationship between CAAQ and ROA of Private Banks in Ethiopia at the 1% significance level. The coefficient 0.206876 implies that a one-birr change in the ratio of capital adequacy that 20.69% change in return on asset keeping the effect of other variables constant.

Finally, the coefficient of Number of Bank Branch's (NBB) is negative and significant at the 5 percent significance level. This indicates a change in the NBB leads to an opposite change on return on asset. Adanech Shifa (2017) and Yiregalem Nigussie (2015) found the same outputs of correlation analysis Banks branch expansion has negative impact on profit fluctuation and Bank size has negative relation with ROA.

Despite the usual explanation that large banks tend to mobilize resources at relatively small costs and then generates better profit, the findings of this regression analysis concluded to the contrary. The statistical significance of NBB on return on asset is in line with the hypothesis but not its direction of influence. In Ethiopian commercial banks, the coefficient of NBB is 0.00004 which means that a one hundred percent increase in the bank size leads to 0.004-unit decrease in the return on asset ratio.

We can now having coefficients of the variables included in the study by operational model. Generally model of profitability (ROA) of Ethiopian commercial banks specified in chapter three is:

$$ROA_{it} = \beta_o + \beta_{it}USD + \beta_{it}SEK + \beta_{it}CAAQ + \beta_{it}BN + \beta_{it}INF + \beta_{it}GDP + \varepsilon_{it} \dots \dots \dots (2)$$

Where;

ROA_{it} = the Return on Asset of banks i at time t.

$\beta_{it}USD$ = exchange rate of USD to Birr assigned to bank i at time t.

$\beta_{it}SEK$ = exchange rate of SEK to Birr assigned to bank i at time t.

$\beta_{it}CAQ$ = Capital Adequacy for the bank i at time t.

$\beta_{it}BN$ = Bank Branch Number for the bank i at time t.

$\beta_{it}INF$ = Inflation rate at time t.

GDP=Growth domestic production at time t.

ε_{it} = Error term

Based on regression result presented in Table 4.9 the model of this study can be written as follows:

$$ROA = 0.0241868 + 0.0011168 * USD - 0.0025924 * SEK + 0.0016508 * GDP + 0.0001149 * INF + 0.206876 * CAAQ - 0.0000403 * NBB$$

The effect of explanatory variables on profitability of Ethiopian commercial banks summarized as the following Table 4.10.

Table 4-10 Summary of significant result from the ROA model

Variables	Definition	Expectation	Regression Result	Statistically Significant
USD	United State of America Dollar	?	+	10%
NBB	Number of Bank Branches	+	-	5%
CAAQ	Capital Adequacy Ratio	+	+	1%

Summary of results from STATA ROA regression output, 2021.

Which all the summary explanatory variables have statistically significant impact on profitability of Ethiopian private commercial banks; as measured by Return on asset (ROA) at a maximum level of 10%. From bank specific variables, Number of bank branches significant at 5% and Capital Adequacy Ratio significant at 1%. From the macroeconomic variables GDP and Inflation rate are statistically insignificant even with a higher insignificant level. Specifically, USD and SEK are the main objective of this study which identifies its effect on the profitability of commercial banks in Ethiopia, showed a significant positive and negative relation with the profitability of Ethiopian commercial banks for the study period respectively at 10% significant (USD) and at a higher insignificant level (SEK).

CHAPTER FIVE

5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Foreign exchange fluctuations is changes in the currency rate that influences the firms' value, which is represented by return on asset (ROA) in this study. The expected and unexpected fluctuation in foreign exchange rate movement affects ROA and has created concern among firms and investors. This motivates the researcher to investigate the significant effect of foreign currencies exchange exposure towards ROA and assesses any significant changes in the foreign currency exchange exposure during 2012/13 – 2019/20.

It was the major aim to investigate effects of exchange rate on private commercial banks performance for the period from July 01, 2012 to June 30, 2020. The second objective of this study is to examine the effect of currency fluctuation on private commercial banks performance in Ethiopia. The findings of the research show that exchange rate change had an influence on commercial banks performance in Ethiopia in the study period. The finding is portrayed a positive connection between the USD and the profits of banks over study period. Thirdly, the change in SEK was negative related to changes private commercial banks in Ethiopia. Fourth, the research findings indicated that banks branch number had increased over the research period. But, this NBB may doesn't critical facilitate an increase in the return on assets. There is positive relationship between CAAQ and ROA. This is higher capital can lead banks have strong bargaining power for determine interest, as the higher capital the lower external financing need and decrease interest expense and increase profit, thus this is positively contribute for commercial banks profitability.

The study also discovered that the magnitude and size of exposure varies across the currencies. Most firms basically have greater exposure to the U.S dollar and SEK, which might be due to the fact that the United States and Europe are the main trade business partners in Ethiopia. Furthermore, foreign trading activities are mainly contracted or denominated in U.S. dollar and some in SEK/EURO dollar. Therefore, if the U.S. dollar currency changes significantly, then this will directly affect the firm's value through the trade flow impact. Besides that, firms in tradable sectors are more sensitive to change in the exchange rate compared to non-tradable firms. This is

because of the nature of the business as the tradable sector is assumed to be actively engaged in export and import.

In conclusion, based on the sample firms, the foreign currency exchange fluctuations in Ethiopian private banks is significant due to the above-mentioned reason or justification. However, the exposure may vary depending on the economic situation, exchange rate evolution and time variation.

5.2 Conclusions

The study found the association between currency exchange rate fluctuations and financial performance. Additionally, the Ethiopian birr exchange rate against the US Dollar was found to be high during the study period. In essence, the Ethiopian currency (Birr) has been depreciating in values against the dollar over the recent years and this depreciation has positive effects on returns and for Sweden Kroner (SEK) has negative effect on private banks return. The finding also concludes that total assets owned by commercial banks and the inflation rates were increasing over the years.

The conclusions that were obtained from the results of this study in section above were as indicated here.

Firstly, the evidence strongly suggests existence of a positive association between USD exchange rate and banks performance in Ethiopia. The finding shows that an increase in an USA dollar results in significant increase on the returns of the banks regardless of an increase in operating costs, on which the Sweden Kroner (SEK) has negative effect eliminated due to asset revaluations.

Secondly, of the regression analysis indicated that there is significant relationship between CAAQ (capital adequacy) and financial performance of commercial banks in Ethiopia hence it has strong effect performance. The relationship between GDP and returns on assets was insignificant and positive. The result of the analysis also shows that, there is an insignificant and positive relation between inflation rate and financial performance as a result of higher costs are expected to result in higher margin.

Finally, bank specific variables are more significant than macroeconomic variables in the study period for private commercial banks Profitability.

5.3 Recommendations

- The study recommends the policy makers should always be take into account that the issues related to foreign currency fluctuation in efforts to improve private commercial banks financial performance.
- The study also recommends the Ethiopian private commercial banks should improve their profitability by formulating or revising their bank branches expansion policies.
- The study further recommends National Bank of Ethiopia to implement efficient monetary and fiscal policies so as to help to improve return on asset of private banks.

Future suggestion

For the future researchers I recommend you there is many problems related and gaps such around foreign currency works in Ethiopia so who have motive to do and solve on this site its very best and also if your title was on the Factors affecting foreign currency fluctuation and its effects on bank profitability in Ethiopia.

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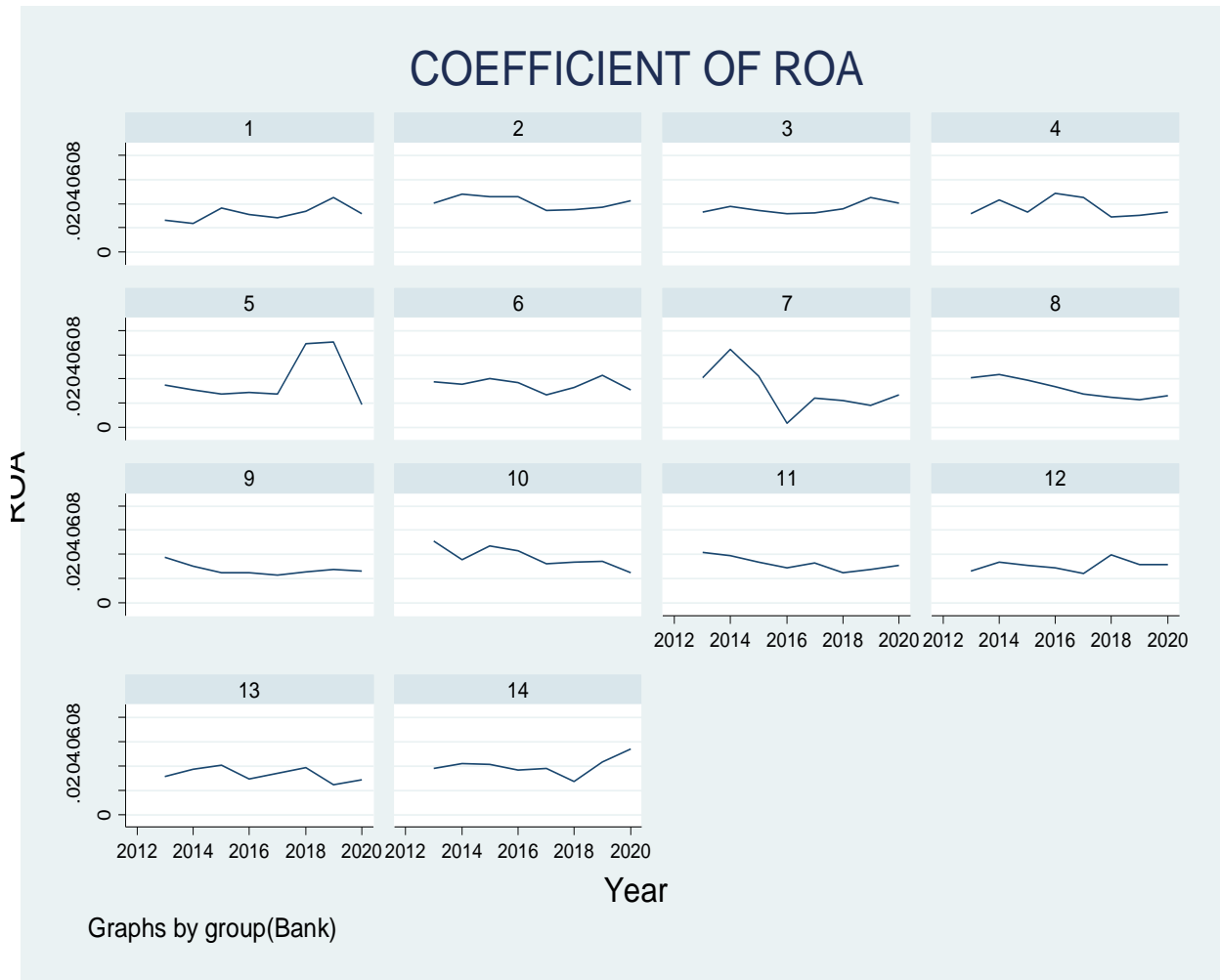
6 APPENDICES

Appendix1: List of Private Commercial banks in Ethiopia

No.	Name of Banks	Year of Establishment	Number years since establishment till 2020
1	Awash International Bank	1994 G.C	26
2	Dashen Bank	1995 G.C	25
3	Bank of Abyssinia	1996 G.C	24
4	Wegagen Bank	1997 G.C	23
5	Hibret Bank	1998 G.C	22
6	Nib International Bank	1999 G.C	21
7	Cooperative Bank Of Oromia	2004 G.C	16
8	Lion International	2006 G.C	14
9	Zemen Bank	2008 G.C	12
10	Oromia International Bank	2008 G.C	12
11	Buna International Bank	2009 G.C	11
12	Berhan International Bank	2009 G.C	11
13	Abay Bank S.C	2010 G.C	10
14	Addis International Bank	2011 G.C	9
15	Dehub Global Bank S.C	2012 G.C	8
16	Enat Bank	2012 G.C	8

Source: NBE website, www.nbe.gov.et, Bank list Page

Appendix 2: Summary Coefficient of ROA



Where;

1= Abay Bank, 2= Addis International Bank, 3=Awash International Bank, 4= Berhan International Bank, 5= Bank of Abyssinia (BAO), 6= Buna International Bank, 7= Cooperative Bank of Oromia, 8= Dashen Bank, 9= Hibret Bank, 10= Lion Bank, 11= Nib International Bank, 12= Oromiya International Bank, 13= Wegagen Bank and 14= Zemen Bank

Appendix 3: Summary of Secondary data

Bank	Year	ROA	USD	GBP	EUR	SEK	DJF	CHF	SAR	AED	CAD	YEN	GDP	INF	NBB
Awash	2013	0.0328	19.6750	28.6284	24.4109	2.7871	0.1052	19.8011	4.9959	5.1010	17.9376	0.1908	9.9	13.5	115
Awash	2014	0.0375	20.6688	33.49275	26.78945	2.9131	0.1104	22.02505	5.2460	5.35665	18.3947	0.19405	10.3	8.1	152
Awash	2015	0.0342	21.9094	32.4437	22.9671	2.4838	0.1160	22.1316	5.5108	5.6274	16.7291	0.1682	10.4	7.6	207
Awash	2016	0.0317	23.2237	29.4309	24.2822	2.5751	0.1229	22.3429	5.8416	5.9650	16.8612	0.2135	8	9.7	245
Awash	2017	0.0322	27.3984	30.1095	26.4866	2.7248	0.1303	24.2191	6.1923	6.3222	18.8260	0.2061	10.1	7.2	339
Awash	2018	0.0355	29.0555	35.8563	31.7301	3.0469	0.1538	27.4479	7.3055	7.4584	20.6065	0.2486	7.7	13.1	382
Awash	2019	0.0448	35.1571	36.9033	33.0390	3.1325	0.1630	29.7121	7.7471	7.9095	22.1257	0.2694	9	12.6	423
Awash	2020	0.0403	18.7358	43.3216	39.6713	3.7833	0.19725	37.2230	9.37075	9.5705	25.7429	0.3280	6.1	19.9	481
Dashen	2013	0.0412	19.6750	28.6284	24.4109	2.7871	0.1052	19.8011	4.9959	5.1010	17.9376	0.1908	9.9	13.5	111

							2				6				
Dashen	2014	0.0436	20.6688	33.49275	26.78945	2.9131	0.1104	22.02505	5.2460	5.35665	18.3947	0.19405	10.3	8.1	142
Dashen	2015	0.0389	21.9094	32.4437	22.9671	2.4838	0.1160	22.1316	5.5108	5.6274	16.7291	0.1682	10.4	7.6	164
Dashen	2016	0.0333	23.2237	29.4309	24.2822	2.5751	0.1229	22.3429	5.8416	5.9650	16.8612	0.2135	8	9.7	232
Dashen	2017	0.0272	27.3984	30.1095	26.4866	2.7248	0.1303	24.2191	6.1923	6.3222	18.8260	0.2061	10.1	7.2	315
Dashen	2018	0.0252	29.0555	35.8563	31.7301	3.0469	0.1538	27.4479	7.3055	7.4584	20.6065	0.2486	7.7	13.1	381
Dashen	2019	0.0228	35.1571	36.9033	33.0390	3.1325	0.1630	29.7121	7.7471	7.9095	22.1257	0.2694	9	12.6	421
Dashen	2020	0.0262	18.7358	43.3216	39.6713	3.7833	0.19725	37.2230	9.37075	9.5705	25.7429	0.3280	6.1	19.9	436
Abyssinia	2013	0.0346	19.6750	28.6284	24.4109	2.7871	0.1052	19.8011	4.9959	5.1010	17.9376	0.1908	9.9	13.5	78
Abyssinia	2014	0.0312	20.6688	33.49275	26.78945	2.9131	0.1104	22.02505	5.2460	5.35665	18.3947	0.19405	10.3	8.1	109
Abyssinia	2015	0.0274	21.9094	32.4437	22.9671	2.4838	0.1160	22.1316	5.5108	5.6274	16.7291	0.1682	10.4	7.6	136

Abyssini a	2016	0.029 0	23.223 7	29.43 09	24.2 822	2.575 1	0.1 22 9	22.3 429	5.8 416	5.9 650	16. 861 2	0.2 135	8	9.7	185
Abyssini a	2017	0.027 8	27.398 4	30.10 95	26.4 866	2.724 8	0.1 30 3	24.2 191	6.1 923	6.3 222	18. 826 0	0.2 061	10.1	7.2	253
Abyssini a	2018	0.069 3	29.055 5	35.85 63	31.7 301	3.046 9	0.1 53 8	27.4 479	7.3 055	7.4 584	20. 606 5	0.2 486	7.7	13.1	286
Abyssini a	2019	0.070 8	35.157 1	36.90 33	33.0 390	3.132 5	0.1 63 0	29.7 121	7.7 471	7.9 095	22. 125 7	0.2 694	9	12.6	353
Abyssini a	2020	0.019 0	18.735 8	43.32 16	39.6 713	3.783 3	0.1 97 25	37.2 230	9.3 707 5	9.5 705	25. 742 9	0.3 280	6.1	19.9	579
Wegage n	2013	0.031 3	19.675 0	28.62 84	24.4 109	2.787 1	0.1 05 2	19.8 011	4.9 959	5.1 010	17. 937 6	0.1 908	9.9	13.5	79
Wegage n	2014	0.037 4	20.668 8	33.49 275	26.7 8945	2.913 1	0.1 10 4	22.0 250 5	5.2 460	5.3 566 5	18. 394 7	0.1 940 5	10.3	8.1	100
Wegage n	2015	0.040 5	21.909 4	32.44 37	22.9 671	2.483 8	0.1 16 0	22.1 316	5.5 108	5.6 274	16. 729 1	0.1 682	10.4	7.6	119
Wegage n	2016	0.029 6	23.223 7	29.43 09	24.2 822	2.575 1	0.1 22 9	22.3 429	5.8 416	5.9 650	16. 861 2	0.2 135	8	9.7	161
Wegage n	2017	0.033 8	27.398 4	30.10 95	26.4 866	2.724 8	0.1 30 3	24.2 191	6.1 923	6.3 222	18. 826 0	0.2 061	10.1	7.2	223
Wegage	2018	0.038											7.7	13.1	292

n		3	29.055	35.85	31.7	3.046	0.1	27.4	7.3	7.4	20.	0.2			
			5	63	301	9	53	479	055	584	606	486			
Wegage	2019	0.024	35.157	36.90	33.0	3.132	0.1	29.7	7.7	7.9	22.	0.2			355
n		7	1	33	390	5	63	121	471	095	125	694	9	12.6	
Wegage	2020	0.028	18.735	43.32	39.6	3.783	0.1	37.2	9.3	9.5	25.	0.3			399
n		2	8	16	713	3	97	230	707	705	742	280	6.1	19.9	
Hibret	2013	0.037	19.675	28.62	24.4	2.787	0.1	19.8	4.9	5.1	17.	0.1			75
		5	0	84	109	1	05	011	959	010	937	908	9.9	13.5	
Hibret	2014	0.030	20.668	33.49	26.7	2.913	0.1	22.0	5.2	5.3	18.	0.1			99
		4	8	275	8945	1	10	5	460	5	394	940	10.3	8.1	
Hibret	2015	0.024	21.909	32.44	22.9	2.483	0.1	22.1	5.5	5.6	16.	0.1			128
		9	4	37	671	8	16	316	108	274	729	682	10.4	7.6	
Hibret	2016	0.024	23.223	29.43	24.2	2.575	0.1	22.3	5.8	5.9	16.	0.2			144
		7	7	09	822	1	22	429	416	650	861	135	8	9.7	
Hibret	2017	0.022	27.398	30.10	26.4	2.724	0.1	24.2	6.1	6.3	18.	0.2			204
		5	4	95	866	8	30	191	923	222	826	061	10.1	7.2	
Hibret	2018	0.025	29.055	35.85	31.7	3.046	0.1	27.4	7.3	7.4	20.	0.2			233
		2	5	63	301	9	53	479	055	584	606	486	7.7	13.1	
Hibret	2019	0.027	35.157	36.90	33.0	3.132	0.1	29.7	7.7	7.9	22.	0.2			294
		4	1	33	390	5	63	121	471	095	125	694	9	12.6	
Hibret	2020	0.026	20.668	43.32	39.6	3.783	0.1	37.2	9.3	9.5	25.	0.3			351
		2	8	16	713	3	97	230	707	705	742	280	6.1	19.9	

							25		5		9				
NIB	2015	0.033 3	21.909 4	32.44 37	22.9 671	2.483 8	0.1 16 0	22.1 316	5.5 108	5.6 274	16. 729 1	0.1 682	10.4	7.6	115
NIB	2016	0.029 0	23.223 7	29.43 09	24.2 822	2.575 1	0.1 22 9	22.3 429	5.8 416	5.9 650	16. 861 2	0.2 135	8	9.7	155
NIB	2017	0.032 4	27.398 4	30.10 95	26.4 866	2.724 8	0.1 30 3	24.2 191	6.1 923	6.3 222	18. 826 0	0.2 061	10.1	7.2	203
NIB	2018	0.024 7	29.055 5	35.85 63	31.7 301	3.046 9	0.1 53 8	27.4 479	7.3 055	7.4 584	20. 606 5	0.2 486	7.7	13.1	228
NIB	2019	0.027 5	35.157 1	36.90 33	33.0 390	3.132 5	0.1 63 0	29.7 121	7.7 471	7.9 095	22. 125 7	0.2 694	9	12.6	280
NIB	2020	0.030 8	18.735 8	43.32 16	39.6 713	3.783 3	0.1 97 25	37.2 230	9.3 707 5	9.5 705	25. 742 9	0.3 280	6.1	19.9	327
CBO	2013	0.040 8	19.675 0	28.62 84	24.4 109	2.787 1	0.1 05 2	19.8 011	4.9 959	5.1 010	17. 937 6	0.1 908	9.9	13.5	74
CBO	2014	0.064 7	20.668 8	33.49 275	26.7 8945	2.913 1	0.1 10 4	22.0 250 5	5.2 460	5.3 566 5	18. 394 7	0.1 940 5	10.3	8.1	105
CBO	2015	0.042 0	21.909 4	32.44 37	22.9 671	2.483 8	0.1 16 0	22.1 316	5.5 108	5.6 274	16. 729 1	0.1 682	10.4	7.6	141
CBO	2016	0.003 5	23.223 7	29.43 09	24.2 822	2.575 1	0.1 22 9	22.3 429	5.8 416	5.9 650	16. 861 2	0.2 135	8	9.7	184

CBO	2017	0.024 2	27.398 4	30.10 95	26.4 866	2.724 8	0.1 30 3	24.2 191	6.1 923	6.3 222	18. 826 0	0.2 061	10.1	7.2	287
CBO	2018	0.022 4	29.055 5	35.85 63	31.7 301	3.046 9	0.1 53 8	27.4 479	7.3 055	7.4 584	20. 606 5	0.2 486	7.7	13.1	332
CBO	2019	0.018 4	35.157 1	36.90 33	33.0 390	3.132 5	0.1 63 0	29.7 121	7.7 471	7.9 095	22. 125 7	0.2 694	9	12.6	405
CBO	2020	0.027 1	18.735 8	43.32 16	39.6 713	3.783 3	0.1 97 25	37.2 230	9.3 707 5	9.5 705	25. 742 9	0.3 280	6.1	19.9	430
Lion	2013	0.051 2	19.675 0	28.62 84	24.4 109	2.787 1	0.1 05 2	19.8 011	4.9 959	5.1 010	17. 937 6	0.1 908	9.9	13.5	45
Lion	2014	0.035 2	20.668 8	33.49 275	26.7 8945	2.913 1	0.1 10 4	22.0 250 5	5.2 460	5.3 566 5	18. 394 7	0.1 940 5	10.3	8.1	62
Lion	2015	0.047 0	21.909 4	32.44 37	22.9 671	2.483 8	0.1 16 0	22.1 316	5.5 108	5.6 274	16. 729 1	0.1 682	10.4	7.6	88
Lion	2016	0.043 1	23.223 7	29.43 09	24.2 822	2.575 1	0.1 22 9	22.3 429	5.8 416	5.9 650	16. 861 2	0.2 135	8	9.7	121
Lion	2017	0.032 0	27.398 4	30.10 95	26.4 866	2.724 8	0.1 30 3	24.2 191	6.1 923	6.3 222	18. 826 0	0.2 061	10.1	7.2	158
Lion	2018	0.033 5	29.055 5	35.85 63	31.7 301	3.046 9	0.1 53 8	27.4 479	7.3 055	7.4 584	20. 606 5	0.2 486	7.7	13.1	210
Lion	2019	0.034											9	12.6	235

		1	35.157	36.90	33.0	3.132	0.1	29.7	7.7	7.9	22.	0.2				
			1	33	390	5	63	121	471	095	125	694				
Lion	2020	0.024	18.735	43.32	39.6	3.783	0.1	37.2	9.3	9.5	25.	0.3				272
		6	8	16	713	3	97	230	707	705	742	280		6.1	19.9	
Zemen	2013	0.038	19.675	28.62	24.4	2.787	0.1	19.8	4.9	5.1	17.	0.1				8
		1	0	84	109	1	05	011	959	010	937	908		9.9	13.5	
Zemen	2014	0.042	20.668	33.49	26.7	2.913	0.1	22.0		5.3	18.	0.1				9
		0	8	275	8945	1	10	250	5.2	566	394	940		10.3	8.1	
Zemen	2015	0.041	21.909	32.44	22.9	2.483	0.1	22.1	5.5	5.6	16.	0.1				7
		2	4	37	671	8	16	316	108	274	729	682		10.4	7.6	
Zemen	2016	0.036	23.223	29.43	24.2	2.575	0.1	22.3	5.8	5.9	16.	0.2				13
		6	7	09	822	1	22	429	416	650	861	135		8	9.7	
Zemen	2017	0.037	27.398	30.10	26.4	2.724	0.1	24.2	6.1	6.3	18.	0.2				22
		8	4	95	866	8	30	191	923	222	826	061		10.1	7.2	
Zemen	2018	0.027	29.055	35.85	31.7	3.046	0.1	27.4	7.3	7.4	20.	0.2				25
		5	5	63	301	9	53	479	055	584	606	486		7.7	13.1	
Zemen	2019	0.043	35.157	36.90	33.0	3.132	0.1	29.7	7.7	7.9	22.	0.2				44
		3	1	33	390	5	63	121	471	095	125	694		9	12.6	
Zemen	2020	0.054	18.735	43.32	39.6	3.783	0.1	37.2	9.3	9.5	25.	0.3				52
		0	8	16	713	3	97	230	707	705	742	280		6.1	19.9	
OIB	2013	0.026	19.675	28.62	24.4	2.787	0.1	19.8	4.9	5.1	17.	0.1				65
		1	0	84	109	1	05	011	959	010	937	908		9.9	13.5	

							2				6				
OIB	2014	0.033 3	20.668 8	33.49 275	26.7 8945	2.913 1	0.1 10 4	22.0 250 5	5.2 460	5.3 566 5	18. 394 7	0.1 940 5	10.3	8.1	109
OIB	2015	0.030 8	21.909 4	32.44 37	22.9 671	2.483 8	0.1 16 0	22.1 316	5.5 108	5.6 274	16. 729 1	0.1 682	10.4	7.6	152
OIB	2016	0.028 8	23.223 7	29.43 09	24.2 822	2.575 1	0.1 22 9	22.3 429	5.8 416	5.9 650	16. 861 2	0.2 135	8	9.7	210
OIB	2017	0.024 1	27.398 4	30.10 95	26.4 866	2.724 8	0.1 30 3	24.2 191	6.1 923	6.3 222	18. 826 0	0.2 061	10.1	7.2	237
OIB	2018	0.039 4	29.055 5	35.85 63	31.7 301	3.046 9	0.1 53 8	27.4 479	7.3 055	7.4 584	20. 606 5	0.2 486	7.7	13.1	260
OIB	2019	0.031 5	35.157 1	36.90 33	33.0 390	3.132 5	0.1 63 0	29.7 121	7.7 471	7.9 095	22. 125 7	0.2 694	9	12.6	277
OIB	2020	0.031 5	18.735 8	43.32 16	39.6 713	3.783 3	0.1 97 25	37.2 230	9.3 707 5	9.5 705	25. 742 9	0.3 280	6.1	19.9	314
Buna	2013	0.037 7	19.675 0	28.62 84	24.4 109	2.787 1	0.1 05 2	19.8 011	4.9 959	5.1 010	17. 937 6	0.1 908	9.9	13.5	33
Buna	2014	0.035 7	20.668 8	33.49 275	26.7 8945	2.913 1	0.1 10 4	22.0 250 5	5.2 460	5.3 566 5	18. 394 7	0.1 940 5	10.3	8.1	63
Buna	2015	0.040 4	21.909 4	32.44 37	22.9 671	2.483 8	0.1 16 0	22.1 316	5.5 108	5.6 274	16. 729 1	0.1 682	10.4	7.6	82

Buna	2016	0.0367	23.2237	29.4309	24.2822	2.5751	0.1229	22.3429	5.8416	5.9650	16.8612	0.2135	8	9.7	105
Buna	2017	0.0270	27.3984	30.1095	26.4866	2.7248	0.1303	24.2191	6.1923	6.3222	18.8260	0.2061	10.1	7.2	143
Buna	2018	0.0328	29.0555	35.8563	31.7301	3.0469	0.1538	27.4479	7.3055	7.4584	20.6065	0.2486	7.7	13.1	176
Buna	2019	0.0431	35.1571	36.9033	33.0390	3.1325	0.1630	29.7121	7.7471	7.9095	22.1257	0.2694	9	12.6	209
Buna	2020	0.0308	18.7358	43.3216	39.6713	3.7833	0.19725	37.2230	9.37075	9.5705	25.7429	0.3280	6.1	19.9	244
Berhan	2013	0.0319	19.6750	28.6284	24.4109	2.7871	0.1052	19.8011	4.9959	5.1010	17.9376	0.1908	9.9	13.5	22
Berhan	2014	0.0432	20.6688	33.49275	26.78945	2.9131	0.1104	22.02505	5.2460	5.35665	18.3947	0.19405	10.3	8.1	48
Berhan	2015	0.0332	21.9094	32.4437	22.9671	2.4838	0.1160	22.1316	5.5108	5.6274	16.7291	0.1682	10.4	7.6	71
Berhan	2016	0.0486	23.2237	29.4309	24.2822	2.5751	0.1229	22.3429	5.8416	5.9650	16.8612	0.2135	8	9.7	88
Berhan	2017	0.0449	27.3984	30.1095	26.4866	2.7248	0.1303	24.2191	6.1923	6.3222	18.8260	0.2061	10.1	7.2	177
Berhan	2018	0.029											7.7	13.1	168

		2	29.055	35.85	31.7	3.046	0.1	27.4	7.3	7.4	20.	0.2			
			5	63	301	9	53	479	055	584	606	486			
Berhan	2019	0.030	35.157	36.90	33.0	3.132	0.1	29.7	7.7	7.9	22.	0.2			217
		3	1	33	390	5	63	121	471	095	125	694	9	12.6	
Berhan	2020	0.033	18.735	43.32	39.6	3.783	0.1	37.2	9.3	9.5	25.	0.3			256
		1	8	16	713	3	97	230	707	705	742	280	6.1	19.9	
ABAY	2013	0.026	19.675	28.62	24.4	2.787	0.1	19.8	4.9	5.1	17.	0.1			47
		1	0	84	109	1	05	011	959	010	937	908	9.9	13.5	
ABAY	2014	0.023	20.668	33.49	26.7	2.913	0.1	22.0	5.3	5.3	18.	0.1			70
		7	8	275	8945	1	10	250	5.2	5.66	394	940	10.3	8.1	
ABAY	2015	0.036	21.909	32.44	22.9	2.483	0.1	22.1	5.5	5.6	16.	0.1			89
		7	4	37	671	8	16	316	108	274	729	682	10.4	7.6	
ABAY	2016	0.031	23.223	29.43	24.2	2.575	0.1	22.3	5.8	5.9	16.	0.2			116
		0	7	09	822	1	22	429	416	650	861	135	8	9.7	
ABAY	2017	0.028	27.398	30.10	26.4	2.724	0.1	24.2	6.1	6.3	18.	0.2			152
		6	4	95	866	8	30	191	923	222	826	061	10.1	7.2	
ABAY	2018	0.034	29.055	35.85	31.7	3.046	0.1	27.4	7.3	7.4	20.	0.2			162
		0	5	63	301	9	53	479	055	584	606	486	7.7	13.1	
ABAY	2019	0.045	35.157	36.90	33.0	3.132	0.1	29.7	7.7	7.9	22.	0.2			200
		2	1	33	390	5	63	121	471	095	125	694	9	12.6	
ABAY	2020	0.031		43.32	39.6	3.783	0.1	37.2	9.3	9.5	25.	0.3			232
		7		16	713	3	97	230	707	705	742	280	6.1	19.9	

Appendix 4: Simple OLS model result

```
. regress ROA USD SEK GDP INF CAAQ NBB
```

Source	SS	df	MS	Number of obs	=	112
				F(6, 105)	=	3.72
Model	.00178903	6	.000298172	Prob > F	=	0.0022
Residual	.008419218	105	.000080183	R-squared	=	0.1753
				Adj R-squared	=	0.1281
Total	.010208248	111	.000091966	Root MSE	=	.00895

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
USD	.0001424	.000481	0.30	0.768	-.0008113 .0010961
SEK	.001853	.0065363	0.28	0.777	-.0111072 .0148131
GDP	.0014333	.001293	1.11	0.270	-.0011305 .003997
INF	.0001881	.0005424	0.35	0.729	-.0008873 .0012635
CAAQ	.0820745	.0305179	2.69	0.008	.0215631 .1425859
NBB	-.0000122	.0000118	-1.04	0.302	-.0000355 .0000111
_cons	.0009126	.0178562	0.05	0.959	-.0344929 .0363181

Appendix 4: random Effect Model

```
. xtreg ROA USD SEK GDP INF CAAQ NBB, re
```

```
Random-effects GLS regression                Number of obs   =       112
Group variable: code                        Number of groups =       14

R-sq:                                       Obs per group:
  within = 0.1723                            min =           8
  between = 0.3694                           avg =          8.0
  overall = 0.1751                           max =           8

Wald chi2(6) =       21.50
corr(u_i, X) = 0 (assumed)                   Prob > chi2     =       0.0015
```

ROA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
USD	.0001788	.0004827	0.37	0.711	-.0007673 .0011248	
SEK	.0016638	.0064335	0.26	0.796	-.0109457 .0142733	
GDP	.001442	.0012712	1.13	0.257	-.0010494 .0039335	
INF	.0001865	.0005337	0.35	0.727	-.0008595 .0012325	
CAAQ	.0878916	.0326777	2.69	0.007	.0238444 .1519387	
NBB	-.0000131	.0000125	-1.05	0.295	-.0000376 .0000114	
_cons	-.00017	.017659	-0.01	0.992	-.034781 .034441	
sigma_u	.00170609					
sigma_e	.00854953					
rho	.03829648	(fraction of variance due to u_i)				

Appendix 5: Homoskedasticity result test

```
. imtest, white
```

```
White's test for Ho: homoskedasticity  
against Ha: unrestricted heteroskedasticity
```

```
chi2(20)      =      8.58  
Prob > chi2   =      0.9873
```

```
Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	8.58	20	0.9873
Skewness	6.72	6	0.3479
Kurtosis	3.23	1	0.0721
Total	18.53	27	0.8864