Determinants of Financial Performance of Private Commercial Banks in Ethiopia: Evidence from Some Selected Private Commercial Banks in Ethiopia

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Abstract

The motivation behind this study was to explore the determinants of private commercial banks' profitability in Ethiopia by utilizing a panel data of seven commercial banks from the year 2007 to 2018. The investigation utilized a quantitative research approach and secondary financial data were analyzed by using multiple linear regression models. A fixed-effect regression model was applied to research the effect of capital adequacy, liquidity risk, bank deposits, and loan to deposit proportion, bank branches, real GDP and inflation rate on return on assets (ROA). The findings of the investigation demonstrate that loan to deposit ratio and bank branches have a measurably significant and positive relationship with the bank's profitability. Then again, factors like liquidity risk, bank deposit, and inflation rate have a negative and statistically significant relationship with banks' profitability. Notwithstanding, the relationship for capital adequacy and real GDP was seen as factually inconsequential. The study suggests concentrating and improvements the firms together with significant key internal and external factors of profitability of commercials banks in Ethiopia

Key Words: *Profitability, Private Commercial Bank, Capital Adequacy, Liquidity Risk, Bank Deposits, Real GDP, Inflation Rate, Return on Assets (ROA)*

1. Introduction

The profitability of banks is important since the soundness of the banking industry is closely connected to the soundness of the whole economy (Lipunga, 2014). The financial strength of a banking institution is unquestionably associated with its profitability, thus, the most important need of any bank's management and leadership is to make profits continuously since this will guarantee a bank's continuous existence. As such, achieving profitability goals is vital to any bank (Adeusi, Kolapo & Aluko, 2014). The banking sector's profitability is also central as the well-being of the industry is closely associated with the wellness of the whole economy in general (Alkhazaleh & Almsafir, 2014).More so, the banking field has the potential of coordinating the funds of an economy by transferring the finances from the savings envelopes to investment projects.

The banking system of Ethiopia demonstrates a vital role in contributing to the national economy by intermediating between savers and productive investors. The interests of depositors, shareholders, regulators, prospective investors, and corporate owners are all impacted by the financial performance of banks. Since banks control the majority of the country's financial industry, maintaining the financial stability of these organizations will probably maintain the stability of the nation's financial system as a whole. (Abebaw and Kapur, 2011). The importance of bank profitability at the micro and macro levels has made researchers, academics, bank management, and bank regulatory authorities to develop a considerable interest in the factors that establish bank profitability (Molyneux and Thornton, 1992; Athanasoglou, Brissimis and Delis, 2005). Hence, the object of this study is to investigate the determinants of the financial performance of private commercial banks in Ethiopia by utilizing bank-level data for the period of 2007-2018.

1.1. Statement of the Problem

The most excellent performance of any industry in general and any firm, in particular, plays the role of increasing the market value of that specific firm together with the role of leading towards the growth of the whole industry which ultimately leads to the overall achievement of the economy. The corporate finance literature has come to recognize the need of measuring the performance of financial institutions because, in their capacity as intermediaries, these businesses offer more than just means of saving money and transferring risk also helps to channel funds properly from surplus economic units to deficit economic units to support the investment activities in the economy.

Several studies have also been done on the determinants of banks' profitability locally and across the globe. Globally, a study by Athanasoglou and Delis (2005) evaluated the impact of industry-specific, bank-specific and macro-economic determinants of commercial bank's profitability and established that all bank-specific determinants, apart from size, influence banks profitability.

Furthermore, certain research investigations have demonstrated the correlation between economic expansion and bank profitability. Boitan (2015) tried to understand the factors that influence bank profitability in the European Union (EU) countries. According to the results, a high and positive Granger causality is found from the GDP growth rate to the bank profitability.

Furthermore, Petria, Capraru & Ihnatov(2015) also showed that GDP growth affects bank profitability by using regression analysis in their studies. Additionally, Al-Jafari and Alchami (2014) found that bank profitability and economic growth had a positive association using a GMM technique. Parallel to this study, Djalilov and Piesse (2016) also reached a similar conclusion by using the same method. Duraj and Moci (2015) also stated that macroeconomic variables are important indicators of bank profitability.

In the context of Ethiopia, the studies conducted by Semu (2010) assessed the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. The findings of the study showed that net deposit and paid-up capital have a statistically significant relationship with banks' performance measured in terms of return on equity. On the other hand, Damena (2011) applied the balanced panel data of seven Ethiopian Commercial banks that cover the period from 2001 to 2010.The estimation results show that all bank-specific determinants, except for saving deposits, significantly affect commercial bank's profitability in Ethiopia. Another important component that determines profitability is market concentration. Finally, concerning macroeconomic variables, only economic growth exhibits a significant relationship with banks' profitability.

While the study made by Abera (2012) found that capital strength, income diversification, bank size, and gross domestic product have a statistically significant and positive relationship with banks' profitability. However, the profitability of banks is negatively and statistically significantly correlated with characteristics such as asset quality and operational efficiency. However, the relationship for liquidity risk, concentration, and inflation is found to be statistically insignificant. Alemu (2015) has investigated the determinants of commercial bank's profitability in Ethiopia by using panel data of eight commercial banks from the year 2002 to 2013.The empirical result found that that bank size, capital adequacy and gross domestic product have statistically significant and positive relationship with banks profitability. However, there is a statistically significant negative correlation between the profitability of banks and variables such as funding costs, operational efficiency, liquidity risk, and the expansion of the banking sector. Statistical analysis reveals that the correlation between foreign exchange rate, employee efficiency, inflation, and management efficiency is negligible. Dawit (2017) conducted a study on determinants of commercial banks profitability: An empirical study on private commercial banks in Ethiopia. The empirical result found that bank size, capital adequacy, and gross domestic product have a statistically significant and positive relationship with banks' profitability. However, there is a negative and statistically significant correlation between the profitability of banks and variables such as funding costs, operational efficiency, liquidity risk, and the expansion of the banking sector. However, the relationship for management efficiency, employee efficiency, Inflation, and the foreign exchange rate is found to be statistically insignificant.

To fill the gap in the literature, the researcher decides to include deposits and loan into analysis and make further regression to check whether the outcomes change or fixed with the past research.

Hence, the purpose of this study is to examine the determinants of profitability in the Ethiopian private commercial banking sector by utilizing an econometrics model to estimate both the internal and external determinants of profitability of private commercial banks in Ethiopia which was projected to fill the existing knowledge gap.

1.2. Objective of the Study

Specifically, this investigation addressed the following objectives:

1. To examine the major internal factors that determine private commercial banks profitability
2. To measure the impact of GDP growth rate and inflation rate on the private commercial banks' profitability

1.3. Hypotheses of the Study

Based on the objective, the present study seeks to test the following hypotheses.

HP1: There is a significant positive relationship between capital adequacy and the bank's profitability.

HP2: There is a significant positive/ negative relationship between deposits and a bank's profitability.

HP3: There is a significant positive relationship between the number of bank branches and a bank's profitability.

HP4: There is a significant Positive/Negative relationship between the liquidity and the bank's profitability.

HP5: There is a significant positive relationship between the loan to deposit ratio and the bank's profitability.

HP6: There is a significant positive/negative relationship between real gross domestic product and the bank's profitability.

HP7: There is a significant positive/negative relationship between inflation and bank profitability.

2. Literature Review

Empirical Literature Review of Previous Studies on Ethiopia

Few studies were appearing on the determinants of commercial bank profitability in Ethiopia by taking different internal and external variables taken into account. Most literature that is examined in this study used several banks specific, industry-specific, and macroeconomic factors as a determinant of banks profitability.

Amdemikael (2012) investigated factors affecting profitability on Ethiopian banking industry. This study examines the bank-specific, industry-specific and macro-economic factors affecting bank profitability for eight commercial banks operating in Ethiopia, covering the period of 2000-2011.The findings of the study show that capital strength, income diversification, bank size, and gross domestic product have a statistically significant and positive relationship with banks' profitability. Yet, there is a statistically significant and negative correlation between the profitability of banks and factors like asset quality and operational effectiveness. However, the relationship for liquidity risk, concentration, and inflation is found to be statistically insignificant.

Habtamu (2012) examined the determinants of Ethiopian private commercial banks' profitability in Ethiopia by using panel data of seven private commercial banks from the year 2002 to 2011. The empirical results show that bank-specific factors; capital adequacy, managerial efficiency, bank size, and macro-economic factors; the level of GDP, and regulation have a strong influence on the profitability of private commercial banks in Ethiopia.

Birhanu (2012) examined the effect of bank-specific, industry-specific and macroeconomic determinants of Ethiopian commercial banking industry profitability from the period 2000 – 2011.The result reveals that all bank-specific determinants, except bank size, expense management and credit risk, affect bank profitability significantly and positively in an anticipated way. However, bank size, expense management and credit risk affect the commercial bank's profitability significantly and negatively. In addition to this, no evidence is found in support of the presence of market concentration. Finally, from macroeconomic determinants GDP has a positive and significant effect on both assets return and interest margin of the bank. But interest rate policy has a significant and positive effect only on interest margin.

Samuel (2015) analyzed that the determinants of commercial banks' profitability in Ethiopia by using data of eight commercial banks from year 2002 to 2013. The study's conclusions demonstrate that the profitability of banks is positively correlated and statistically significant with their size, capital adequacy, and gross domestic product. However, there is a negative and statistically significant correlation between the profitability of banks and variables such as funding costs, operational efficiency, liquidity risk, and the expansion of the banking sector. Statistical analysis reveals that the correlation between foreign exchange rate, employee efficiency, inflation, and management efficiency is negligible.

Melaku (2016) investigated the determinants of bank profitability in Ethiopian private banks using secondary data. The study employed audited financial statements of six sampled private commercial banks from 2004 to 2011.The major findings of the study showed that bank-specific determinants were very important in explaining profitability than external variables. The Asset size, capitalization, labor productivity, liquidity, and non-interest income were positively and significantly related to the bank's profitability, whereas credit risk and overhead efficiency harm the profitability of bank specific drivers.

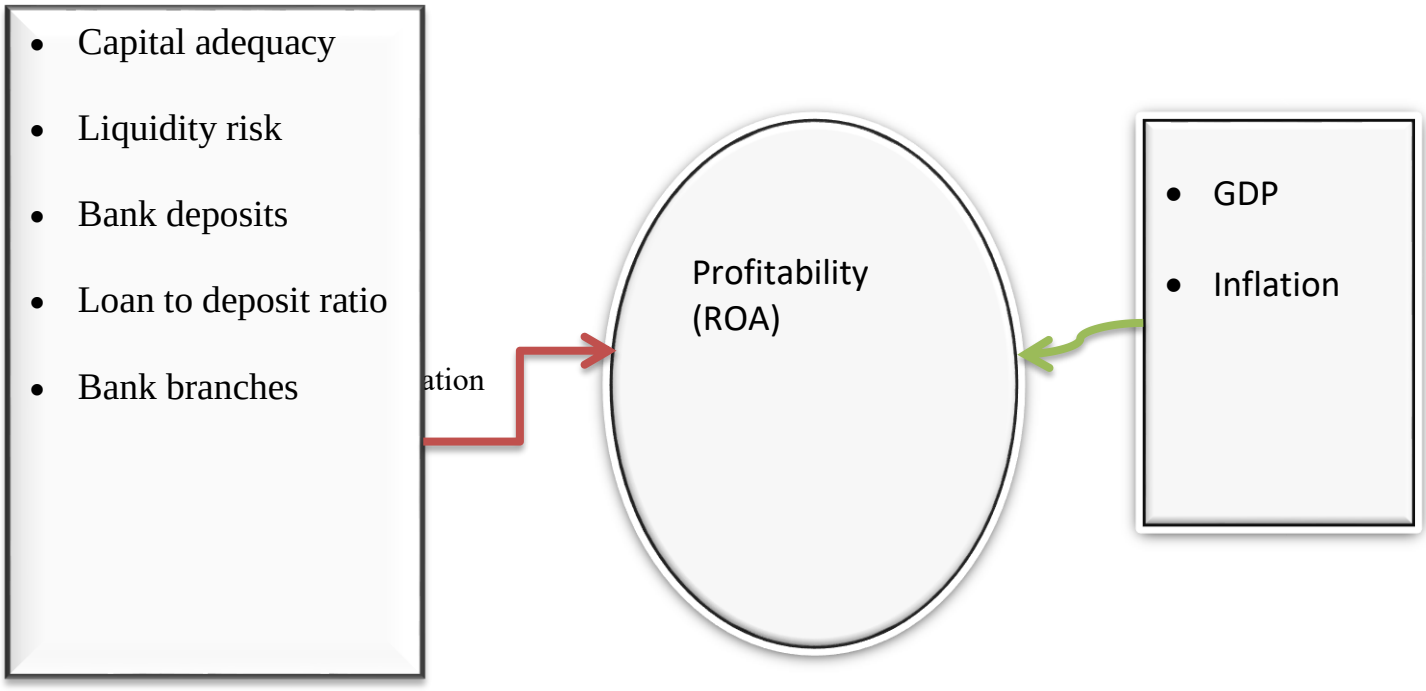
Gemechu (2016) examined the determinants of banks' profitability: evidence from the banking industry in Ethiopia. The study applied balanced panel data of eight Ethiopian commercial banks that cover the period of 2002 - 2012.The findings of the study revealed that all bank-specific determinants except credit risk and expense management have a statistically significant and positive relationship with banks' profitability. On the other hand, variables like credit risk, expense management, and regulation have a negative and statistically significant relationship with banks' profitability. All macroeconomic determinants in this study like economic growth, interest rate spread, and exchange rate have a statistically significant and positive relationship with banks' profitability.

Hence, the purpose of this study is to investigate the determinants of profitability in Ethiopian private commercial banking sector by utilizing an econometrics model to estimate both the internal and external determinants of profitability of private commercial banks in Ethiopia which is proposed to fill the existing knowledge gap.

Conceptual Framework for the Study

A conceptual framework shows the relationship between the variables under investigation. The study seeks to identify determinants of banks' profitability hence independent variables will include the bank's size, capital adequacy, liquidity, number of bank branches, bank deposits, and GDP, inflations. The dependent variable was profitability.

Figure 1 Conceptual Framework



3. Research Methodology

3.1. Research Approach

In light of the research objective and hypotheses presented at the beginning of this article along with the underlying philosophy of each research approach, in this study, adopts quantitative approach. The main objective of this study was to examine the internal and external factors that determine the profitability of private commercial banks in Ethiopia for the period covering from 2007 to the year 2018.

3.2. Research Design

The design of this research is explanatory research design that adopts a quantitative research approach by using secondary data.

3.3. Population and Sampling Techniques:

The target population of this study included all commercial banks registered by NBE and operating in Ethiopia. According to NBE 2017/18 reports, currently, the number of banks declined to 18 from 19 due to the merger of Construction & Business Bank with Commercial Bank of Ethiopia. Out of the 18 banks 16 were private and 2 public. However, because of the lack of 12years' data that is required for the analysis purpose, banks that started their operation after 2007 are excluded from the study. As a result, the number of sample banks is reduced to seven.

The study employed a non-probability purposive sampling technique. The rationale behind selecting purposive sampling techniques than others is, it is considered more appropriate when the universe happens to be small and a known characteristic of it is to be studied intensively. Therefore, out of private sixteen commercial banks in Ethiopia that are currently in operation; the investigator has taken seven of them. The total sample consists of 84 (12× 7) bank-year observations. The ground behind selecting seven banks out of the total population is based on the following criteria's:

- Ownership structure (only private commercial banks are included in the study). Here, cooperative banks are excluding from the study since their purpose of establishment is different from commercial banking business purposes.
- Time establishment (only banks who have twelve and above years' experiences in the banking operations include). This indicates a reasonable time is necessary to look at changes in the business of banking. Therefore, based on the above criteria; Dashen, Awash, Wegagen, Abyssinia, Nib, United, and Lion banks’ share companies were chosen in this study.

3.4. Data Type and Source

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

3.5. Data Collection

To explore the effect of bank-specific factors on the profitability of banks audited financial statements of seven privately owned commercial banks (Awash International Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank, United Bank, Nib International Bank and Lion international bank) for twelve consecutive years was collected. The secondary data collected through document reviews are mainly from the records held by NBE and the banks themselves. The researcher was assembling financial data from the annual reports of the sampling banks between 2007 and 2018. Besides, to financial data, macroeconomic data was gathering from the National bank of Ethiopia. The periods in this study were characterized by some important changes in the banking industry in Ethiopia especially in terms of change in inflation rate and growth rate of the economy.

3.6. Definition of Variables

3.6.1. Dependent Variable

The study examined the profitability of Ethiopian privately possessed commercial banks by using a return on asset (ROA) as a dependent variable. ROA is an indicator of how profitable a company is relative to its total assets. It gives us an idea as to how efficient management is in using its assets to generate earnings.

ROA= Net income/ Total asset.

ROA is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that the bank owns.

3.6.2. Independent Variable

Following prior researches towards the determinants of banks' profitability, the independent variables are classifying into banks specific, industry-specific, and macroeconomic variables. Moreover, these subsection present hypotheses, by proposing the expected sign of the coefficients, based on academic literature.

Bank Specific Determinants

The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. From the previously discussed factors in the literature review, the following were selected and used in this research

Capital Adequacy: It is measured by the ratio of equity capital to total assets. It examines the relationship between profitability and bank capitalization. A high capital asset ratio is an assumed indicator of low advantage and therefore lower risk. Conversely, banks with lower capital adequacy are considered riskier relative to highly capitalized banks. Bashir (2003), and Samuel (2015) find a positive relationship with financial performance that a well-capitalized bank faces a lower cost of going bankrupt which reduces their costs of funding and risks.

HP1: There is a significant positive relationship between the amount of capital of a bank and the bank's profitability.

Liquidity: Another important decision that the managers of private commercial banks must take refers to the liquidity management and specifically the ability of an organization to meet its obligations and the solvency of an organization. It indicates the percentage of bank loans funded through deposits. The ratio of the bank's advances to deposits is used as a measure of liquidity.

HP2: There is a significant positive/negative relationship between the Liquidity of the bank and the bank's profitability.

Deposits: The deposit variable is defined as the ratio of total deposits over total assets. The total deposits include the bank's domestic deposits as well as the foreign ones. Intuitively, more deposits enable the bank to expand its business, therefore improve the bank's profitability.Hence, deposits generally had a positive impact on the profitability of the banks. However, if a bank could not transform its deposits into loans efficiently it might bring a negative impact on profitability also.

HP3: There is a significant positive/negative relationship between deposits of the bank and the bank's profitability

Loan-Deposit Ratio: The researcher use loans over total assets to explain the loan's impact on the bank's performance. This ratio is regarded as a measure both of bank's credit risk and lending specialization. **HP4: Loan to deposit ratio has a positive and significant effect on bank profitability.**

Banks Branches (BB): The number of branches that every bank has. It reflects the market share, power, and the geographical distribution of the bank.

HP5: There is a significant positive relationship between bank branches and bank's profitability.

Macroeconomic Determinants

Macroeconomic determinants are those factors, which affect all business activities of a given country. From the previously discussed factors in the literature review, the following was selected and uses in this research.

Real GDP growth: The real gross domestic product is the measure of total economic activity within the economy and it is a commonly used economic indicator. The gross domestic product growth (GDP)**,** calculated as the annual change of the GDP is used as a measure of the macroeconomic conditions.

HP6: There is a significant positive /negative relationship between real GDP growth and the bank's profitability.

Inflation: Another important macroeconomic condition, which may affect both the costs and revenues of banks, is the inflation rate. From the literature review, the impact of inflation on profitability depends on whether inflation is anticipated or unanticipated. If anticipated, the interest rates are adjusted accordingly resulting in revenues, which increase faster than costs, with a positive impact on profitability.

If inflation is unanticipated, the banks may be slow in adjusting their interest rates, which results in a faster increase in bank costs than bank revenues that consequently hurt bank profitability.

HP7: There is a significant positive/negative relationship between inflation and bank profitability.

Table 1: Definitions, Notation, and Anticipated Impact of the Explanatory Factors

Variables	Measure	Notation	Expected Sign
Dependent variables			
Return on Asset	Net Income/Total Asset	*ROA*	*NA*
Independent Variables			
Bank Specific Variables			
Liquidity	*Bank Advance/Deposit*	*LIQ*	+/-
Deposits	Total deposits/ total an asset	*DP*	+/-
Loan to deposits	Total loans/total deposits	*LDR*	+
Capital adequacy	Equity/Total Asset	*CAP*	+
Bank branches	Natural log of bank branches	*BB*	+
Macroeconomic variables			
Gross Domestic Growth	Real GDP growth (in %)	*GDP*	+/-
Inflation rate	The annual inflation rate	*INF*	+/-

Source: Author's Computation

3.7. Data Analysis and Model Specification

The researcher used both descriptive statistics and econometrics to analyze the collected data. A descriptive statistical tool was used to analyze the mean, standard deviation, minimum and maximum values of the study. On the other hand, an econometric tool particularly the fixed-effect model enabled the researcher to verify causes of changes within banks' of the study matter beyond descriptive statistical tools. The paper used panel data. This is due to the fact that panel data, which combines time-series and cross-sectional information to capture individual variability, has the advantage of providing more meaningful data, which captures dynamical adjustment, the collected panel data were analyzed using descriptive statistics and multiple linear regression analysis. For this study, the regression analysis known as OLS was used to estimate the relationship between profitability and its determinants using E-views 10 econometric software packages. In light of the above, to investigate the relationship between capital adequacy (CAP), deposits (DP), liquidity (LEQ), banks branches (BB), loan deposit ratio (LDR), gross domestic product (GDP), and inflation (INF) a with return on asset (ROA) the following linear regression model is developed. The regression model of this study is estimated in the following form.

$$ROA_{it} = \beta_0 + \beta_1 LEQ + \beta_2 DP + \beta_3 LDR + \beta_4 CA + \beta_5 BB + \beta_6 GDP + \beta_8 INF + Error\ (E)$$

This study used an ordinary least squares (OLS`) regression to estimate the linear equation and according to Brooks (2008), there are basic assumptions required to show that the estimation technique, OLS, had some desirable properties, if the Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have several desirable properties, and are known as best Linear Unbiased Estimators (BLUE). Thus, this study has tested the all assumptions of OLS.

Test for Heteroscedasticity

To test for the presence of heteroscedasticity, the Breusch- Pagan-Godfrey test was employed in this study. For the Heteroscedasticity test, the following hypothesis was developed:

H0: There is no Heteroscedasticity problem in the model.

H1: There is a Heteroscedasticity problem in the model. $\alpha = 0.05$

Decision Rule: If the p-value is smaller than the level of significance, reject H0.Otherwise, fail to reject H0.

Test for Autocorrelation

In this investigation, the widely used Breusch-Godfrey Serial Correlation LM Test was utilized to determine whether autocorrelation existed. The following was the formulation of the autocorrelation test hypothesis:

H0: There is no autocorrelation problem in the model.

H1: There is an autocorrelation problem in the model. $\alpha = 0.05$

Decision Rule: If the p-value is smaller than the level of significance, reject H0.Otherwise, do not reject H0.

Test for normality

The following was the formulation of the hypothesis for the normalcy test:

H0: Error term is normally distributed

H1: Error term is not normally distributed $\alpha = 0.05$

Decision Rule: Dismiss H0 if JB's p-value is less than the level of significance. Otherwise, do not Reject H0.

Test for Multicollinearity

When applying the OLS estimation method, an implicit assumption is made regarding the lack of correlation between the explanatory variables. In this study multicollinearity test will be conducted.

Ramsey RESET test was used to realize whether the established model is correctly regressing or not.

H0: the model is correctly specified

H1: the model is not correctly specified $\alpha = 0.05$

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

4. Result and Discussion

This section is organized into four sections. In the first sections 4.1, were presented the descriptive statistics of the dependent and independent variables. The next section 4.2 discussed the test for the classical linear regression model/CLRM. In Section 4.3 deals with correlation analysis. Then finally, the results of regression analysis were presented under section 4.4

4.1. Descriptive Statistics

Table 2 presents the results of the descriptive statistics for the main variables involved in the regression model. The key descriptive measures are the mean, standard deviation, the minimum, and maximum, Skewness, Kurtosis, and the Jarque-Bera values of the variables over the period taken into account. The summary statistics for all variables are reported in the table below.

Table 1: Descriptive Statistics of Variables

Descriptive Statistics of Variables								
	ROA	LEQ	DP	LDR	CA	BB	GDP	INF
Mean	0.17205	0.76617	0.51081	0.61107	0.14362	0.93482	0.10704	0.06030
Median	0.16106	0.78803	0.29300	0.63200	0.13224	0.27001	0.10460	0.04050
Maximum	0.44548	0.99876	0.984530	0.98140	0.17052	0.60853	0.13460	0.28000
Minimum	0.01973	0.21348	0.19300	0.21120	0.08812	0.37918	0.07730	0.00100
Std. Dev.	0.10196	0.20605	0.44407	0.23521	0.05294	0.05848	0.01558	0.06418
Skewness	0.56648	-1.04553	1.86165	-0.58810	4.17285	0.01720	-0.04029	1.53053
Kurtosis	2.69385	3.67707	5.68845	2.55367	28.30871	2.20647	2.57883	4.93741
Jarque-Bera	4.820661	16.90825	73.81723	5.53929	2485.634	2.20806	0.64356	45.9329
Probability	0.08979	0.00021	0.00000	0.06268	0.00000	0.33153	0.72486	0.00000
Observations	84	84	84	84	84	84	84	84

Source: Secondary Data and Author's Computation

As displayed in Table 2 above, the descriptive statistics of the study composed of 84 observations collected from seven commercial banks in Ethiopia from 2007 to 2018. The mean of return on asset (ROA) was around 17.20% for the sampled commercial banks in Ethiopia with a minimum of 1.97% and a maximum of 44.54%. This indicates, the most profitable bank among the sampled banks earned 44.54% of profit after tax for every one birr invested in the company's assets. Whereas the least profitable bank of the sampled banks earned 1.97 % of profit after tax for every one birr invested in the company's assets. The standard deviation statistics for ROA was (0.1019), which confirms that there was an average variation between banks' during the study period undertaken. The result implies that these banks need to optimize the use of their assets to increase the return on their assets.

On the other hand, the outputs of the descriptive statistics indicate that the ratio of liquid assets to total assets was 76.62 %, on average, with a minimum of 21.34% and a maximum of 99.87%.Furthermore, the outputs of the descriptive statistics indicate which is explained by total loans divided by total asset, provides a measure of the main income source of the bank assets transferred to debtors the ratio of Deposit to Asset was 51.08%, on average, with a minimum of 19.30%and a maximum of 98.45 %. This indicates that private commercial banks in Ethiopia composed 51.08% of customer deposits on assets. This shows that bank sources are part of the total assets. Customer deposit is one of the cheapest sources of funds due to the high margin between deposit and lending rate that banks utilize to generate income. Moreover, the figure shows that private commercial banks in the country target. Which indicated that a relatively large deviation from the mean by 0.44 among the bank-specific independent variables.

Loan to deposit ratio (LTDR) is a ratio between the bank's total loans and total deposits, The minimum and maximum value of loans which the banks can give out is 21% and 98% respectively which can deviate by 23.52% with an average value of 61.10%: which indicated that a relative standard deviation from the mean by 0.23 domestic resources, mainly customer deposit, for their banking business. This indicates that private commercial banks in Ethiopia use 61.10% of customer deposits for advancing purposes.

The ratio of equity to total assets (CA) was a proxy measure of bank capital adequacy with a mean value of 14.36%. This implies that the sampled banks in this particular study 14.36% of their fund need to be satisfied through equity capital. The standard deviation ratio was 0.05294% with 8.8% and 17.05% as minimum and maximum values respectively.

Banks Branches (BB) is the number of branches that every bank has. It reflects the market share, power, and the geographical distribution of the bank. The average mean distribution value of bank branches was found to be 93. 48 % with a minimum of 37.91% and a maximum of 60.85%, the standard deviation ratio found 0.05848. That specifies the number of branches rise Return on Assets appropriately goes up subsequently of Branches energies.

On the other hand, the table also shows the mean of macroeconomic variables over the period considered for this study. On average, the growth rate of GDP is approximately 10% (minimum 7.73% and a maximum of 13.46%).

The second control variable is the annual rate of inflation of Ethiopia, which is amounted to 6.03% on average for the entire study period with 4.05% and 28% of its lower and higher values. This result indicates the existence of a significant variation in the rate of inflation of Ethiopia during the entire study period.

4.2. CLRM Assumption and Model Test

Diagnostic tests were carried out to ensure that the data fits the basic assumptions of the classical linear regression model. Hence, the following sections discuss the results of the diagnostic tests.

4.2.1. Heteroscedasticity

In this study, as revealed below, both the F-statistic and Chi-Square versions of the test statistic draw the same conclusion that there is no evidence for the presence of heteroscedasticity since the p-values were more than 0.05. This indicates that there is no evidence that we do not reject the null hypothesis inferring that the residuals are homoscedastic since the p-value was considerably over 0.05.

Table 3: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.000868	Prob. F(7,75)	0.4375
Obs*R-squared	7.090989	Prob. Chi-Square(7)	0.4195
Scaled explained SS	4.717304	Prob. Chi-Square(7)	0.6944

Source: Secondary Data and Author's Computation

As shown in table 3, all versions of the white test statistic (F-statistic, Chi-Square and Scaled explained SS) gave the same conclusion that there was no evidence for the presence of heteroscedasticity, since the p-values of 0.4375, 0.4195, and 0.6944 for F- statistic, Chi-Square and Scaled explained SS respectively were more than 0.05, so the null hypothesis should not be rejected.

4.2.2. Tests for Autocorrelation

In this study, the Breusch Godfrey Serial Correlation LM Test is used to carry out the autocorrelation test. To find out if the model has an autocorrelation issue, the p-value is obtained. If the p-value is more than a 5% significant level, it implies that there is no autocorrelation problem in the model. The following was the hypothesis that was developed for the model specification test:

H0: There is no autocorrelation problem.
H1: There is an autocorrelation problem. $\alpha = 0.05$ Decision Rule: Reject H0 if P-value is less than significant level 0.05. Otherwise, do not reject H0.

Table 4: Outcomes of Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.391759	Prob. F(2,75)	0.2550
Obs*R-squared	3.005977	Prob. Chi-Square(2)	0.2225

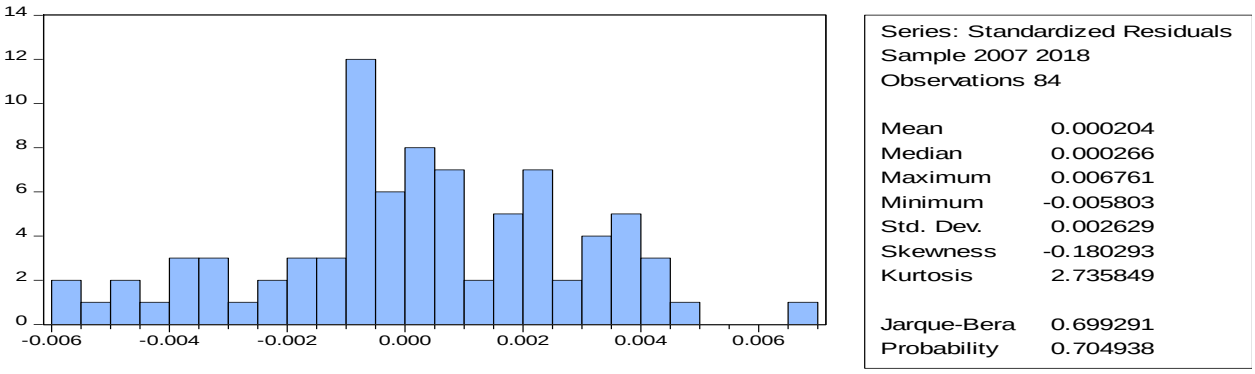
Source: Secondary Data and Author's Computation

From table 4, it can be concluded that this research does not reject the null hypothesis (H0), since the p-value is 0.2550, which is greater than the significance level of 0.05. Thus, it can be concluded that the model does not consist of an autocorrelation problem.

4.2.3. Normality Test

Figure 1 indicated that the distribution of the panel observation is symmetric about its mean. The Jarque-Bera statistic has a P-value of 0.704939 which implies that the p-value for the Jarque-Bera test is greater than 0.05 which indicates that there was no evidence for the presence of an abnormality in the data. Hence, the null hypothesis that the data is normally distributed should not be rejected since the p-value was over 0.05.

Figure 1: Normality Test for Residuals



Source: Secondary Data and Author's Computation

4.2.4. Multicollinearity

It is observed from table 5 below, the result of the correlation matrix lies between the ranges of -0.47 and 0.61. As stated by Kennedy (2008), multicollinearity creates problems when the correlation exceeds 0.80. Therefore no problem with multicollinearity in this study.

Table 5: Independent Variables Correlation Matrix

	LEQ	DP	LDR	CA	BB	GDP	INF
LEQ	1	0.13757	0.61559	0.30937	-0.26444	0.08597	0.15313
DP	0.13757	1	0.10038	0.30938	-0.43557	0.10047	0.20526
LDR	0.61559	0.10038	1	0.29531	0.02769	-0.06029	-0.03274
CA	0.30937	0.30938	0.29531	1	-0.47091	0.07204	0.00989
BB	-0.26444	-0.43557	0.02769	-0.47091	1	-0.26130	-0.29238
GDP	0.08597	0.10047	-0.06029	0.07204	-0.26130	1	0.34966
INF	0.15313	0.20526	-0.03274	0.00989	-0.29238	0.34966	1

Source: Secondary Data and Author's Computation

Table 5 above shows that there is no strong pair-wise correlation between the explanatory variables (LEQ, DP, LDR, CA, BB, GDP, and INF). Inter-correlation between the independent variables exceeding 0.80, as a general rule, indicates a potential multicollinearity issue. In this study, the highest correlation coefficient is 0.61559 between liquidity and Loan to deposit ratio. Thus, it can be concluded that almost all variables have low correlation power which implies no multicollinearity problem in the explanatory variables selected to determine the profitability of private commercial banks in Ethiopia.

Table 6: Dependent and Independent Variable Correlation Matrix

	ROA	LEQ	DP	LDR	CA	BB	GDP	INF
ROA	1	-0.18542	-0.20277	-0.13176	-0.09772	0.189068	0.11262	0.322826
LEQ	-0.18542	1	0.137566	0.615591	0.309374	-0.26444	0.085966	0.153131
DP	-0.20277	0.137566	1	0.100382	0.309384	-0.43557	0.100471	0.205262
LDR	-0.13176	0.615591	0.100382	1	0.295309	0.027685	-0.06029	-0.03274
CA	-0.09772	0.309374	0.309384	0.295309	1	-0.47091	0.072044	0.009891
BB	0.189068	-0.26444	-0.43557	0.027685	-0.47091	1	-0.2613	-0.29238
GDP	0.11262	0.085966	0.100471	-0.06029	0.072044	-0.2613	1	0.349658
INF	0.322826	0.153131	0.205262	-0.03274	0.009891	-0.29238	0.349658	1

Source: Secondary Data and Author's Computation

The Correlation analysis indicates that to what extent the explanatory variables are influential on the profitability indicator (ROA). With our bank-specific variables, deposits (DP) and annual inflation rate (INF) are relatively, highly impacting ROA as indicated in table 6. Deposits (DP), Liquidity (LEQ), Loan to deposit ratio (LDR), and Capital Adequacy (CA) were the most negatively correlated variables with ROA.

This shows that, as these variables increase, profitability decrease. On the other hand, the Banks Branches (BB), Gross-domestic Product (GDP), and Inflation rate (INF) seem to be inversely correlated with the ROA.

4.2.5. Model Specification

To select a correct estimated model, the researcher had carried out the Ramsey-RESET Test to check on the model specification. The following was the hypothesis that was developed for the model specification test:

H0: The model specification is correct.

H1: The model specification is incorrect. $\alpha = 0.05$ Decision Rule: Reject H0 if P-value is less than significant level 0.05. Otherwise, do not reject H0.

Table 7: Result of Model Specification Test

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: ROA LEQ DP LDR CA BB GDP INF C

	Value	df	Probability
t-statistic	1.164784	75	0.2478
F-statistic	1.356723	(1, 75)	0.2478
Likelihood ratio	1.505949	1	0.2198

Source: Secondary Data and Author's Computation

From table 7, it can be concluded that this research does not reject the null hypothesis (H0), since the p-value is 0.2478, 0.2478, and 0.2198 for t-statistic, f-statistic, and Likelihood ratio which is greater than the significance level of 0.05. Thus, it can be concluded that the model specification is correct from the year 2007 to 2018**.**

4.2.6. Model Selection Test: Random Model versus the Fixed Effect Model

As indicated by the Housman test result the probability value of the test shows 0.0011 which implies that we reject the null hypothesis saying the random effect model is appropriate. Accordingly, for this research, the preferred model is the fixed effect and has been used to meet the objective of this study. Based on the Housman test, the researcher cannot accept the null hypothesis. The estimation of the model using fixed effects generates the following output.

Table 8: Correlated Random effect Housman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	20.261501	5	0.0011

Source: Secondary Data and Author's Computation

4.2.7. Fixed effect Regression Result

Finally, model specification tests have been made to satisfy the assumptions and to undertake reliable estimations. Overall, the tests have been in line with the CRM. The outputs of the regression were presented in the below table

Table 9: Regression Analysis Result

Dependent Variable: ROA				
Method: Panel Least Squares				
Date: 05/08/22 Time: 06:43				
Sample: 2007- 2018				
Periods included: 12				
Cross-sections included: 7				
Total panel (balanced) observations: 84				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CA	-0.480097	0.023230	-20.66744	0.0000***
LEQ	-0.050498	0.022565	-2.237906	0.0284**
DP	-0.172197	0.014136	-12.18151	0.0000***
LDR	0.430760	0.030512	14.11764	0.0000***
CA	0.013531	0.053493	0.252954	0.8010*
BB	0.279872	0.015751	17.76794	0.0000***
GDP	0.111343	0.112201	0.992360	0.3244*
INF	-0.659896	0.122891	-5.369781	0.0000***
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.981119	Mean dependent var.		0.172049
Adjusted R-squared	0.977612	S.D. dependent var.		0.101956
S.E. of regression	0.015255	Akaike info criterion		-5.376784
Sum squared resid	0.016290	Schwarz criterion		-5.971648
Log likelihood	239.8249	Hannan-Quinn criterion		-7.213922
F-statistic	10.44570	Durbin-Watson stat		2.144326
Prob.(F-statistic)	0.000000			

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*, ** And *** =significant at 10%, 5%, and 1% confidence level

No: of observation =84 Source: Secondary Data and Author's Computation

Estimation Equation:

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ROAi, t = C (1) + C (2)*LEQ + C (3)*DP + C (4)*LDR + C (5)*CA + C (6)*BB + C (7)*GDP + C (8)*INF + [CX=F]
Substituted Coefficients**:**
==========
ROA = -0.480097400383 - 0.0504979815654*LEQ - 0.172196503675*DP + 0.430760079133*LDR + 0.0135313130047*CA + 0.279871597882*BB + 0.111343467472*GDP - 0.659895726071*INF + [CX=

R-Square 0.98, Adjusted R-Square 0.97, Prob.(F-Statistic) 0.000, Durbin Watson stat 2.144. Based on the results shown in table 9, all bank-specific independent variables except Capital Adequacy (CA) had a statistically significant impact on profitability. On the other hand, among the macro-economic explanatory variables used in this study GDP had statistically insignificant whereas the inflation rate (INF) had a statically significant impact on banks' profitability. Among the significant variables, Deposits (DP), loan to deposit ratio (LDR), bank branches (BB), and inflation rate (INF) were significant at a 1% significance level since the p-value for all these variables were almost 0.000. However, Liquidity (LEQ) was significant at a 5% significance level with a p-value of 0.0284. Lastly, capital adequacy (CA) and Gross-domestic product (GDP) were not statistically significant variable impacts for the determinants on the profitability of banks in Ethiopia within the period between 2007 and 2018.

The output also displays that the coefficient of liquidity, deposits, and inflation against ROA and were negative with the coefficients of -0.050, -0.172, and -0.659 respectively. This is described as; there was an inverse relationship between the aforementioned three explanatory variables and ROA. As a result, the increase of those variables will lead to a decrease in ROA. On the other hand, variables like the loan to deposit ratio (LDR), capital adequacy (CA), bank branches (BB), and gross-domestic product (GDP) had a positive relationship with profitability as indicated by a coefficient of 0.430, 0.013, 0.279 and 0.111. This confirms that there was a direct relationship between the above listed four explanatory variables and ROA. The value of R-squared statistics and the Adjusted-R squared statistics of the model were 98.11% and 97.76% respectively. The R-squared results state that 98.11% variation in the dependent variable (ROA) is explained by the explanatory variables of the commercial banks in Ethiopia and the rest 1.89% fluctuation of the dependent variable was influenced by other variables which are not included in the model. This indicates the regression model can strongly explain the dependent variables. Prob. (F-statistic) value of 0.000 indicates that it is significant supporting the model relevant to the study. Since the P-value is 0.0% which is less than 5% so bank specific-factors and macro-economic variables jointly influence our dependent variable which is (ROA).

Liquidity Risk

The coefficient of the variable representing liquidity risk (net loans to total assets) is negative and significant with expected signs at 5% and 10% levels, respectively with (p-value =0.0284). This is consistent with the theory that a higher liquidity ratio could influence bank profitability. Higher ratios may be indicative of improved bank profitability because of increased interest incomes from borrowed funds (Berger, Allen & Udell, 2006). Conversely, researchers anticipated a positive correlation between profitability and liquidity risk and came to the conclusion that profitability would increase with the amount of money invested in liquid assets (Eichengreen and Gibson, 2001).

Deposits

Concerning the bank's deposits, the regression results of this study imply that the relationship between deposits and ROA is negative and significant at 1%,5%, and 10% significance level respectively (p-value=0.0000). The result in the regression model indicates that the deposits variable has a significantly negative impact on the bank's profitability. This implies that high statistics for this variable mean low profitability. Since high figures for this variable represents low liquidness, higher deposits are associated with lower profitability. The result is inconsistent with the assertion that holding deposits in a highly liquid form tend to reduce income. The result is however in line with the findings of Guru, Staunton and Balashanmugam (1999), who concluded in their study that bank's deposits negatively correlates with profitability**.**

Loan to Deposit Ratio (LDR)

Concerning the impact of the loan to deposit ratio, the result of the regression output shows that it is statistically significant at 1%,5% and 10% significance level (p-value=0.00000) and has a positive impact on profitability (ROA). This means it describes that one Birr given as a loan from a deposit has the effect of Birr 0.430760 on commercial bank's profitability in Ethiopia. Logically higher loan to deposit ratio indicates, commercial banks have issued more of its deposit in the form of interest-bearing loans; consequently, banks can have generated more profit. But if the ratio is too high banks may default in the repayment of the loan. Too low loan to deposit ratio is also a risk for commercial banks**.**

Capital Adequacy

The coefficient of capital adequacy which is measured by the equity to asset ratio was positive and statistically wasn't significant at any significance level (with p-value=0.8010). The positive coefficient for capital strength was in favor of the signaling or bankruptcy costs hypotheses and opposition to the risk-return trade-off hypothesis. Moreover, the coefficient of the ratio of equity to an asset which was the least high positive coefficient as compared to other variables shows that a capital increase will result in increased profitability. This is in line with the expectation as a bank with a sound capital position can pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability. So from the findings, we can determine that capital adequacy was one of the main determinants of the profitability of private commercial banks in Ethiopia.

Bank Branches

As expected, the impact of bank branches on profitability (ROA), the result implied that the coefficient of the variable is positive and statistically significant at 1% significant level (p-value=0.0000). The results imply that an increase (decrease) in branches has an effect of increases (decrease) profits. Branch expansion is among the main strategies of the bank. This strategy is to increase the quality of service such as giving intended service within few minutes and increasing accessibility of the bank that enables to mobilize deposit and increase customers. The researcher tried to identify the success of this strategy by using branch expansion as one variable. According to the study branch expansion has a positive significant impact on the return on asset of the bank. Therefore, the bank is a successful bank increasing the branches. A fact that supports that the study was conducted by Selamawit (2016).

Gross Domestic Product

One would expect that the impact of GDP on profitability is certain and critical. However, it was a positive recommendation yet not measurably significant even at a 10% significance level (p-value =0.3244), hinting that its impact is immaterial. Moreover, the insignificant parameter indicates that the GDP does not affect Ethiopian private commercial banks' profitability. Thus the hypothesis that states there is a significant relationship between GDP and profitability may be rejected or data did not support the hypothesis. It is also supported by the findings of Krakah & Ameyaw(2010) and Frederick (2014) who found that there was no significant relationship between GDP and banks profitability.

Inflation

The other macroeconomic factor inflation had statistically significant at 1%. The coefficient -0.659896 indicates that inflation affects bank profitability negatively. At the point when inflation of the nation’s decline by 1-unit, different things stay steady the profit will diminish by -0.659896 units. This may infer that bank management may not anticipate the rate of inflation and react accordingly. If inflation is unanticipated, the banks may be slow in adjusting their interest rates, which results in a faster increase in bank costs than bank revenues that consequently have a negative impact on bank profitability.

As indicated by the estimation, the researcher found that the intercept, deposits (DP), loan to deposit ratio (LDR), bank branches (BB), and inflation rate (INF) are measurably critical at a degree of 1%. Then again, liquidity followed a specific pattern toward essentialness (p-esteem is equivalent to 0.0284) lastly, capital adequacy (CA) and gross-domestic product (GDP) were not statistically significant variable impact for the determinants on the profitability of banks in Ethiopia within the period between 2007 and 2018. R-Square 0.98, Adjusted R-Square 0.97, Prob.(F-Statistic) 0.0000, Durbin Watson stat 2.144.

The acceptance or rejection of hypotheses based on model estimation is summarized in the following table.

Table 10: Hypothesis Acceptance or Rejection based on the Model

Hypothesis	Determinants	Statistical Significance	Estimated Effect	Actual Result
				Profitability (ROA
H1	Liquidity risk	Significant	Positive	Negative
H2	Bank Deposits	Significant	Positive	Negative
H3	Loan to-deposit	Significant	Positive	Positive
H4	Capital adequacy	Insignificant	Positive	Positive
H5	Bank-branch	Significant	Positive	Positive
H6	Gross-domestic product	Insignificant	Negative	Positive
H7	Inflation	Significant	Positive	Negative

Source: Author's Computation

5. Conclusion and Recommendations

5.1. Conclusion

This study examines the impact of both internal and external determinants of the Ethiopian private commercial bank's profitability. The internal factors encompassed in this study are variables such as bank's liquidity risk, bank deposits, loan to deposit ratio and capital ratio, and bank branches. While external determinants are used two variables gross domestic product and inflation rate. Additionally, the study used Return on Asset (ROA) as the main measure of bank profitability. Panel data (fixed effects model) from 2007 to 2018 of 7 private commercial banks in Ethiopia was analyzed using the ordinary least square (OLS) regressions method.

The liquidity risk has a negative impact on ROA with a strong significance coefficient. This indicates that banks that hold more liquid assets experience a less significant increase in profitability. The liquidity risk negatively affects ROA with a strong significance coefficient. This demonstrates as banks that hold increasingly fluid resources experience less noteworthy increment in profitability. On the opposite side, the examination found a bank's deposits ratio has a negative and statistically significant impact on the ROA of business banks in Ethiopia. However, banks are required to maintain adequate liquidity to meet customer's demand and measured as the ratio of total deposits to total assets. The result in the regression model designated that the deposits variable has a significantly negative impact on the bank's profitability. This implies that high statistics for this variable mean low profitability.

Loan to Deposit has a positive and statistically significant impact on ROA. This result shows that the bank charge more than what the bank incurring as interest expense for the depositors and the more loan the bank give will have a significant effect on banks profitability. The result showed a positive relationship between capital adequacy and profitability with no statistical significance, showing that an increase in capital adequacy will result in increased profitability.

Bank Branches has a positive and statistically significant impact on ROA. It is the number of branches that every bank has. The results imply that an increase (decrease) in branches has an effect of increases (decrease) profits. It reflects the market share, power, and the geographical distribution of the bank.

Concerning the macro-economic indicators, the inflation rate plays an important role in explaining the banks' return on assets. The negative relationship between inflation and bank performance suggests that a bank's income decreases more with inflation than its costs. Further Gross domestic product was discovered a positive and statistically inconsequential.

The output of the regression model showed that the impact of capital adequacy and gross domestic product on ROA of private commercial banks in Ethiopia is not significant for the period under consideration. The relationship between profitability and loan to deposit ratio, capital adequacy, bank branches, and GDP were found to be positive and but liquidity risk, bank deposits, and inflation rate the relationship were negative.

5.2. Recommendations

The following recommendations are given in light of the study's findings.

- The regression result brings about this examination demonstrates that the association between liquidity and ROA is negative and critical. In this way, the commercial bank in Ethiopia needs to emphasize on that financing in short-term and less risky securities like government treasury bills that leads to increase profitability.
- Those liquidity risks, bank deposits, loan to deposit ratio, and bank branches are significant key internal drivers of the profitability of commercials banks in Ethiopia. Concentrating and restructure the firms together with these indicators could improve the profitability as well as the performance of the commercial banks in Ethiopia.
- There is a requirement for private business banks to consider raising their capital less as it is found to affect profitability. Private business banks should investigate lessening the sum they deliver to investors as profits, rather than utilizing it to bring the capital up notwithstanding selling shares. The administration ought to likewise proceed to urge and request banks to raise their capital.
- As far as lack of innovative products and fear of risky investments by banks themselves are also factors that can affect Ethiopian bank's profitability negatively, Ethiopian banks should try their best to provide new banking services and to participate in risky investment areas which may, in turn, increases their profitability significantly.
- Branch expansion is significantly affecting the profitability of the bank. It one of the main strategies used by the bank to increase its performance by the bank more accessible to the existing and new customers. But branch expansion comes with asset expansion that has its specific impact on the profitability of the bank. By using technology and effective administration, the bank must increase the number of its branches. Therefore, the bank has to increase branches without significantly increasing an asset.

- This is a clear signal to all commercial banks in Ethiopia that they cannot ignore the industry structure and macroeconomic indicators when strategizing to improve on their profits or performance. Ethiopian banks must therefore take into account both the macroeconomic and internal environments when developing strategies to increase their performance or profitability, in addition to their own internal structures and rules.
- Therefore, the study recommends that regulatory authorities like the national bank of Ethiopia should develop effective policies on capital adequacy, liquidity, and inflation rate to ensure that banks are in a position where they can enhance their profitability as well as handle negative shocks if any.

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