
Determinants of Bank Profitability on the Example of a Commercial Bank in Ethiopia

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Abstract:

Purpose: The purpose of this study is to investigate determinants of banks profitability in CBE by using time series data of CBE from year 2003 to 2015.

Design/methodology/approach: The research has econometric research design. The study used quantitative research approach and secondary financial data are analyzed by using Vector Auto Regressive Model (VAR), for the bank profitability was measured by Return on Asset (ROA). OLS method was applied to investigate the impact of bank size, managerial efficiency, liquidity, credit risk, real GDP growth rate, and annual inflation rate.

Findings: The empirical results shows that bank specific factors; bank size, managerial efficiency, credit risk and macro-economic factors; level of GDP and annual inflation rate have a strong influence on the profitability of banks. The empirical study shows that, all explanatory variables in this study have negative effect on the profitability measure except GDP and inflation rate. In addition to this, without liquidity all explanatory variables are statistically significant.

Practical implications: Management bodies of CBE should strive to strengthen the bank specific factors like capital position, managerial efficiency, credit risk, asset quality, and bank size. Because, The competition become tough since increase in new entrant to the market, banks are increasingly being substituted by the general public as a source of funds by new share companies being established in a variety of sectors, and the micro-finance industry continues to show rapid growth.

Originality/value: The banking industry is crucial source of financing different business segments that is operated in a given country.

Keywords: Profitability, Return on Asset (ROA), VAR, OLS.

JEL codes: G21, G32, E44, O16, L25.

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1. Introduction

The banking sector acts as the life blood of modern trade and commerce to provide them with a major source of finance. This increasing phenomenon of globalization has made the concept of efficiency more important both for non-financial and financial institutions and banks are the part of them (Amira and Thalassinos, 2023).

The banking sector is essential of the Ethiopian economy and plays an important financial intermediary role; therefore, its health is very critical to the health of the general economy at large. In the last twenty years there has been a rapid increase in the activity of private banks in Ethiopia, and this has fostered rapid competitiveness among banks in Ethiopia.

In our increasing world of business and finance, the task of each bank operating to make more profit is becoming a challenge with each passing day. In order for an organization like CBE to operate optimally, it has to be able to measure its profitability with regards to its inputs and outputs (Rupeika-Apoga *et al.*, 2018).

The study of profits is important not only because of the information it provides about the health of the economy in any given year, but also because profits are a key determinant of growth and employment in the medium-term. Changes in profitability are an important contributor to economic progress via the influence profits have on the investment and savings decisions of firms (Ahmed *et al.*, 2021).

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 investment (i.e. through retained earnings). Easier access to finance facilitates greater investment which boosts productivity, productive capacity, competitiveness and employment.

The existence, growth and survival of a business organization mostly depend upon the profit which an organization is able to earn. It is true that when Profitability increases the value of shareholders may increase to considerable extent.

The term profitability refers to the ability of the business organization to maintain its profit year after year. The profitability of the organization will definitely contribute to the economic development of the nation by way of providing additional employment and tax revenue to government exchequer. Moreover, it will contribute the income of the investors by having a higher dividend and thereby improve the standard of living of the people (Do *et al.*, 2022).

Like all businesses, banks profit by earning more money than what they in expenses. The major portion of a bank's profit comes from the fees that it charges for its services and the interest that it earns on its assets. Its major expense is the interest paid on its liabilities. The major assets of a bank are its loans to individuals, businesses, and other organizations and the securities that it holds, while its major

liabilities are its deposits and the money that it borrows, either from other banks or by selling commercial paper in the money market.

The determinants of profitability are empirically well explored although the definition of profitability varies among studies. Disregarding the profitability measures, most of the banking studies have noticed that the capital ratio, loan-loss provisions and expense control are important drivers of high profitability. Determinants of bank profitability can be split between those that are internal and those that are external.

The internal determinants of bank profitability can be defined as those factors that are influenced by the bank's management decisions and policy objectives. Management effects are the results of differences in bank management objectives, policies, decisions, and actions reflected in differences in bank operating results, including profitability.

The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the profitability of banks. Athanasoglou *et al.* (2006) stated that the importance of banks is more pronounced in developing countries because financial markets are usually underdeveloped, and banks are typically the only major source of finance for the majority of firms and usually the main depository of economic savings.

Thus, this study focuses on the determinants of profitability of Commercial Bank of Ethiopia. To understand how well a bank is doing, it needs to start by looking at a bank's income statement, the description of the source of income and expenses that affect the bank's profit.

The banking industry in general has experienced some profound changes in recent decades, as innovations in technology and the inexorable forces driving globalization continue to create both opportunities for growth and challenges for banking managers to remain profitable in this increasingly competitive environment, (Athanasoglou *et al.*, 2006).

The very nature of the banking business is so sensitive because more than 85% of their liability is deposits from depositors (Saunders and Cornett, 2008). Banks use these deposits to generate credit for their borrowers, which in fact is a revenue generating activity for most banks. This credit creation process exposes the banks to high default risk which might lead to financial distress including bankruptcy.

Commercial banks in Ethiopia have over the years depended very much on increasing lending rates in order to maximize profits, without much regard to the efficient use of resources that could result in cost minimization. Thus, the performance of commercial banks should be measured in respect of total assets, loans, non-interest income, total overhead expenses, and book values of

stockholder's equity. Whereas commercial bank of Ethiopia is not in a position to increase its lending rate to maximize profit because the bank has a social responsibility to play its macroeconomic role in stabilizing the economy of the country.

Commercial bank of Ethiopia needs to appreciate the role of other indicators in enhancing the profitability for the matter. Indeed examining the determinants of commercial bank's profitability is crucial, if this bank is going to remain competitive, efficient, and viable taking into cognizance the challenges that befall competition in the industry. This thesis builds on earlier research of Pasiouras and Kosmidou (2007), Athanasoglou *et al.* (2008), and Dietrich and Wanzenried (2011), which incorporate macroeconomic, industry specific and bank specific determinants of profitability (Habtamu, 2012), which focused on the factors affecting banks profitability in Ethiopian private commercial banks.

This research extends prior research presented here, in three ways. First, the empirical part of the current research uses data over the last decade for the Ethiopian banking sector, second this thesis aims to extend the determinants of bank's profitability by examining ROA. Third, this thesis attempt to generalize results found by Habtamu (2012) to the state commercial banking sector. In recent time the profit of Commercial bank of Ethiopia is increasing dramatically.

2. Empirical Literature

As per Dietrich and Wanzenried (2011) the coefficient on GDP per capita indicates that banks in higher per capita income countries are more efficient in terms of attracting more deposits and generating stronger cash flows than banks in low income countries. This should not be surprising as countries with higher per capita income (i.e., more developed countries) tend to generate more savings, and hence more deposits.

Concerning other elements of the macro environment, their findings on the effect (or precisely lack thereof) of macro financial structure are no effect of macro financial structure on commercial bank performance. An interesting point to note in this regard is that unlike the experience of some countries (notably in Latin America), high inflation is not necessarily associated with large-scale inefficiencies, which could take the form of price- and non-price behavior, as hypothesized earlier.

The findings that credit risk have a positive and significant effect on profitability. This suggests that risk-averse shareholders target risk adjusted returns and seek larger earnings to compensate higher credit risk. Macroeconomic variables significantly affect bank profitability in Africa. In particular, inflation has a positive effect on bank profits, which suggest that banks forecast future changes in inflation correctly and promptly enough to adjust interest rates and margins (ibid).

The provision to total loans ratio is found to have a significant negative impact on banks' return on assets. Though banks tend to be more profitable when they are able to undertake more lending activities, yet due to the credit quality of lending portfolios and the general practice in Macao, a higher level of provision is needed.

Such a high level of provisions against total loans in fact depresses banks' return on assets significantly. The negative sign on bank size suggests that larger banks achieve a lower ROA than smaller ones. This shows that the interbank market is competitive and efficient since banks with a large retail deposit-taking network do not necessarily enjoy a cost advantage against other banks.

Therefore, rather than size, efficiency is more important in affecting bank profitability. Among the external determinants, only the inflation rate shows the strongest impact on banks' return on assets. This may imply that bank management may anticipate the rate of inflation and react accordingly. Consequently, banks in Macao tend to be more profitable in inflationary environments. As for the economic growth show no impact on bank profitability (Heffernan *et al.*, 2008).

As per Rasiah (2010) interestingly, however, deposit growth (DG) has a negative relationship with both ROA and ROE; the relationship is not only consistent across different methods but also statistically significant in four of the six regressions (Table 3).

The results appear to indicate that while deposit financing may be an important determinant of profitability, some institutions may have reached their optimum deposit–asset ratios and those seeking to expand their deposit base assertively, with the intention of eventually improving profitability, may have to do so at the cost of rising expenses and falling profitability in the meantime.

Moreover, institutions may not be able to convert high growth in deposits into high income generating assets; due perhaps to lack of bankable projects (ADB, 2005). As to Saunders *et al.* (2000), the yearly growth of deposits does not significantly affect bank profitability.

There is no empirical evidence that banks in Switzerland are able to convert an increasing amount of deposit liabilities into significantly higher income earning assets. As to bank size some empirical evidence that larger commercial banks were slightly less profitable than medium-sized banks. The loan loss provision relative to total loans ratio, which is a measure of credit quality, does not have a statistically significant effect on bank profitability before the crisis.

Unsurprisingly and most interestingly, the loan loss provisions, which have also significantly increased during the crisis, negatively affect profitability measure in the period of the crisis. The GDP growth rate does not affect bank profitability in Switzerland.

According to Santabábara *et al.* (2009) Loan loss provision ratio, Liquidity of assets ratio and Overheads ratio have negative correlation. Whereas size has positive correlation confirms the general accepted idea that bigger banks obtain better results.

Dietrich and Wanzenried (2011) found that credit risk has a positive and significant effect on profitability. This suggests that risk-averse shareholders target risk adjusted returns and see larger earnings to compensate higher credit risk. The positive and significant coefficient of the size variable gives support to the economies of scale market-power hypothesis. Larger banks make efficiency gains that can be captured as higher earnings due to the fact that they do not operate in very competitive markets.

The macroeconomic variables significantly affect bank profitability in Africa. In particular, inflation and GDP growth has a positive effect on bank profits. The provision to total loans ratio is found to have a significant negative impact on banks' return on assets. As discussed in the literature, asset quality is reflected in the ratio. Though banks tend to be more profitable when they are able to undertake more lending activities, yet due to the credit quality of lending portfolios and the general practice in Macao, a higher level of provision is needed.

Such a high level of provisions against total loans in fact depresses banks' return on assets significantly. In addition to the above characteristics, the negative sign on market share suggests that larger banks achieve a lower ROA than smaller ones. This shows that the interbank market is competitive and efficient since banks with a large retail deposit-taking network do not necessarily enjoy a cost advantage against other banks.

Therefore, rather than size, efficiency is more important in affecting bank profitability. Among the external determinants, only the inflation rate shows the strongest impact on banks' return on assets. This may imply that bank management may anticipate the rate of inflation and react accordingly. Consequently, banks in Macao tend to be more profitable in inflationary environments.

As for the other variables, namely economic growth, have no impact on bank profitability (Dietrich *et al.*, 2011). Among the internal determinants, the asset quality and market share variables show a significant impact on bank profitability. As for the loan-to-total assets ratio rather than affecting profitability positively, it actually reduces the return on assets (James and José. 2011).

3. Research Methodologies

This part of the study gives detail on how the research activity is carried out. Therefore, the researcher concentrates on the methods that is adopted throughout the study to accomplish the research objectives. It includes the research design, the type of data and source of data used, data analysis and methodology.

3.1 Research Approach and Design

The research has econometric research design as such it follows a mixed approach of both quantitative and qualitative research approach. The main objective of this study is to investigate the determinants of profitability of Commercial bank of Ethiopia. This research paper employed quantitative research design. Quantitative research involves counting and measuring of events and performing the statistical analysis of a body of numerical data. The main concern of quantitative paradigm is that measurement is reliable, valid, and generalized in its cause and effect (Cassell and Symon, 1994).

3.2 Type and Sources of Data

The research paper employed data from secondary sources. Mainly, annual reports of the Commercial bank of Ethiopia over the period, 2003-2015 on the total assets, loans, total non-interest income, total loan loss provisions, total operating expenses will be used to estimate the ratios and coefficients for the internal determinants. For external determinants, data on gross domestic product (GDP) and inflation were obtained from the central statistics authority (CSA) over the period 2003-2015.

3.3 Data Presentation and Analysis

For data analysis purposes, ordinary least square (OLS) method were used to investigate the impact of independent variables on major profitability indicators. i.e., return on asset (ROA) separately. Regression analysis were carried out to test hypotheses to find which independent variable(s) individually and collectively provide a meaningful contribution towards the explanation of the dependent variable noted that if an investigation wishes to determine whether some conceptually measures add anything to the dependent variable. Additionally, STATA and MS Excel were also used to carry out calculations in some cases as STATA provides in-depth investigation in data analysis and visualization.

3.4 Econometric Model Specification

There are a lot of factors that affect bank profitability. Such factors have been studied by many researchers from different countries. Because of differences in the levels of economic development and characteristics of the economic system, the determinants of income inequality are not the same from one country to another even within the country.

The most common determinants are bank size, managerial efficiency, liquidity, credit risk, inflation, and Real GDP. In fact there are many determinants, this paper select six of them based on their relevance for developing countries like Ethiopia. With this framework the mathematical relationship between income inequality and its major macroeconomic determinant are expressed as follows:

$$ROA = (LYA, MGE, LIQ, CR, INF, GDP) \quad (1)$$

Where:

ROA – Return on asset

B_0 – Constant term

β – Coefficient which represents the slope of variables

LTA – natural log of bank size

MGE – Managerial efficiency (TOE/TA)

LIQ - liquidity ratio (TL/TA)

CR – Credit risk (LLP/TL)

INF – inflation rate

GDP – Gross Domestic Products

3.5 Description of Variables

According to Creswell (2009), the variables need to be specified in quantitative researches so that it is clear to readers what groups are receiving the experimental treatment and what outcomes are being measured. Bank profitability is usually measured by the return on average assets, return on equity, and net interest margin which are expressed as a function of internal and external determinants.

From those variables the researcher used ROA as a best profitability measure. The internal determinants include bank-specific variables. The external variables reflect environmental variables that are expected to affect the profitability of banks. In this paper both internal and external variables are used to investigate the determinants of private commercial banks profitability. Dependent variable of bank profitability was measured by the ratio of the Return on Average Assets (ROA). The profitability measure used in the study described as follows;

Return on Asset (ROA): As Golin (2001) points out, the ROA has emerged as key ratio for the evaluation of bank profitability and has become the most common measure of bank profitability. The following authors also used ROA as a measure of bank profitability (Yuqi Li (2006), Abebaw and Depaack (2011), Berger (1995), Indranarain Ramlall (2009), Imad *et al.* (2011), Tobias and Themba (2011), Belayneh (2011), and Athanasoglou *et al.* (2008)).

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

Average assets were used in this study, in order to capture any differences that occurred in assets during the fiscal year. ROA can be calculated as: Return on asset (ROA) = Net profit after tax/ Average total assets.

This 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 bank owns.

This paper used the major dimensions of bank's operation: bank size, managerial efficiency, liquidity, credit risk, inflation, and Real GDP. These variables can be measured in the formula; Bank size: natural logarithm of total of the bank. Managerial efficiency, the ratio of operating expense to operating income was used and the higher the ratio the lower the managerial efficiency, Managerial efficiency = Operating expense/ Operating Income, Liquidity, the ratio of total loans to total deposits was applied to find this variable, Liquidity = Total loan/ Total deposit Credit risk, the ratio of loan loss provision to total loan, Credit risk = LLP/ TL, Inflation, the yearly annual inflation rate was used, Real GDP, the yearly real gross domestic product (GDP) growth rate was used.

3.6 Regression Analysis Model

For time series data we have three main types of models, Vector Error Correction model (VECM), Auto Regressive Distributed Lag model (ARDLM) and Vector Auto Regressive model (VAR). All the variables in a VAR model are endogenous, there is no exogenous variable. Based on available data, this research has used one of the above models. Research has chosen the correct model after testing data.

The variables were integrated of different order, that is a model having combination of variable with I(0) and I(1) order of integration, due to this reason this research has used ARDL model. ARDL model uses a combination of endogenous and exogenous variables, unlike a VAR model which is strictly for endogenous variables, from the bound test of the results.

Because the variables are integrated of different order, that is a model having combination of variable with I(0) and I(1) order of integration, which are not integrated of order two and co-integrated, this research has applied both long run (ARDL) and short run (VECM) models. ARDL model is relatively more efficient in the case of small and finite sample data sizes. Due to this reason researcher has used the Vector Auto Regressive Model (VAR) to determine the relative importance of each independent variable to determine banks profitability.

The p-value of explanatory variables was used to test the hypotheses at a 1%, 5% and 10% significance level. The multiple linear regressions model for ROA is shown on equations below. These models were run by using Stata software. The CBE financial statement was used to analyze the profitability of the bank in Ethiopia. The adopted regression models are presented as follows:

$$ROA = \beta_0 + \beta_1 LTA + \beta_2 MGE + \beta_3 LIQ + \beta_4 CR + \beta_5 INF + \beta_6 GDP + \varepsilon \quad (2)$$

Where:

ROA – Return on asset

B_0 – Constant term

β – Coefficient which represents the slope of variables

LTA – natural log of bank size

MGE – Managerial efficiency (TOE/TA)

LIQ - liquidity ratio (TL/TA)

CR – Credit risk (LLP/TL)

INF – inflation rate

GDP – Gross Domestic Products

ε – Error term.

Based on the above justification for the inclusion of the above variables in the model as espoused by the numerous researchers, prior restrictions have been assigned to the variables as viewed above.

4. Regression Analysis Results and Discussions

Regression analysis is used to determine the values of parameters that cause the function to best fit a set of data observations provided in the model. The model as specified is a combination of both endogenous variables; (natural logarithm of total asset (LTA), managerial efficiency (TOE/TA), liquidity (TL/TA), credit risk (LLP/TL), and exogenous variables; Gross Domestic Product (GDP) and annual inflation rate (INF). In order to establish which of them are key drivers of the banks' profitability, the estimation of the coefficients were done by combining endogenous and exogenous variables. The model assumes that the error terms are homoskedastic and uncorrelated over time- series.

Diagnosis tests: The study was testing the Classical Linear Regression Models (CLRM) assumptions, after running regression model; for return on asset. As per Chris Brooks (2008), the first assumption required that the average value of the errors is zero ($E(u) = 0$). In fact, if a constant term is included in the regression equation, this assumption will never be violated. Since, no intercept parameter without constant term. The first assumption will never be going against, that means there is no potentially severe bias in the slope coefficient estimates in the regression model.

Test for Stationarity: The Augmented Dickey-Fuller (ADF) test is employed to test the stationarity of the variables in the model. As summarized in the Table 1 below, all the variables are stationary at levels (with lag 0) since the critical value is smaller than the computed values for the variables. But, when the lag becomes 1, only ROA, LTA, MGE, and GDP are stationary. The remaining variables, LIQ, CR and INF are non-stationary. For non-stationary variables, the researcher computed stationary at their first difference characterized by I(1) process, implying they are stationary at their first difference.

Table 1. Unit root test (Augmented Dickey-Fuller test

Ag	Test on levels		Test on first difference	
	0	1	0	1
ROA	-2.356**	-2.435**	-2.986**	-3.467**
LTA	3.255 *	2.202**	-2.249**	2.247**
MGE	-3.018*	-9.295 *	-3.628*	-16.304*
LIQ	-2.188 **	-1.573	-2.916 **	-2.191**
CR	-2.012**	-1.407	-2.429**	-2.960**
INF	-1.980 **	-1.789	-3.171*	-2.962 **
GDP	-2.018 **	-17.983*	-3.508 *	-9.415*
Critical values	5%= -1.895 1%= -2.998 constant included	5%= -2.015 1%= -3.365 constant included	5%= -1.943, 1%= -3.143; constant included	5%= -2.132 1%= -3.747; constant included

Note: * Significant 1%, ** Significant 5%

Source: Own study.

Heteroscedasticity test: white test: The second assumption of CLRM stated that the variance of the errors is constant, σ^2 this is known as the assumption of homoscedasticity. If the residuals of the regression have systematically changing variability over the sample, that is a sign of heteroscedasticity. White test was used for general test of heteroscedasticity. Since, Table 2 below, shows that the test result for ROA regression analysis's p-values are considerably in excess of 0.05, we can say that there is no evidence for the presence of heteroscedasticity.

Table 2. White tests for result for the regression model

Ho: Constant variance	
Variables: fitted values of ROA	
chi2 (1)	= 0.0567
Prob > chi2	= 0.1323

Source: Stata output from CBE financial statements.

Autocorrelation test: Durbin-Watson (DW) test: According to Chris Brooks (2008), assumption three said that the CLRM disturbance terms is the covariance between the error terms over time (or cross-sectionally, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. In addition he said that if the errors are not uncorrelated with one another, it would be stated that they are 'autocorrelated' or that they are 'serially correlated'. To test this assumption the Durbin-Watson (DW) statistical test was applied.

As Table 3 below indicates that the DW test result is 2.11 for the profitability measure ROA. This indicates that there was no serious evidence of autocorrelation in the data since the DW test result is not far from two, because Chris Brooks (2008) pointed out the there is no autocorrelation problem if the DW is near 2.

Table 3. Durbin-Watson test result for the regression model

Test	ROA
Durbin-Watson test	2.11

Source: Stata output from CBE financial statements

The fourth CLRM assumption is not violated, Since $E(u) = 0$, this expression will be zero and therefore the estimator is still unbiased, even if the repressors are stochastic. Chris Brooks (2008) added that it turns out the Ordinary Least Square estimator is consistent and unbiased in the presence of stochastic repressors, provided that the repressors are not correlated with the error term of the estimated equation.

Normality test: Bera-Jarque (BJ) test: Finally, assumption five require to check whether the disturbances are normally distributed or not. According to Chris Brooks (2008), one of the most commonly applied tests for normality is the Bera-Jarque (BJ) test.

BJ uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments, the mean and the variance. If the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant.

This means that the p-value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level.

Table 4. Bera-Jarque statistics result for the regression model

	ROA
Probability Jarque-Bera statistic	0.68

Source: Stata output from CBE financial statements.

Thus, the study was tested for this assumption and as it can be seen from the above table, the Bera-Jarque result was a probability of 0.68 for return on asset regression model, this implies that the inferences we made about the coefficient estimates was appropriate.

To examine the relationship between profitability measures and explanatory variables OLS regression analysis were run. This regression model was applied:

$$\text{ROA} = 0.410 - 0.021 \cdot \text{LTA} - 4.807 \cdot \text{MGE} - 0.089 \text{LIQ} - 0.352 \cdot \text{CR} + 0.139 \text{INF} + 0.180 \cdot \text{GDP} \quad (4)$$

In the following Table 5 the coefficients, standard errors, t-values, and p-values for explanatory variables, and R-squared, Adjusted R-squared, Standard Error of regression, F-statistic, Prob (F-statistic) for the regression, and number of observations included in the study are presented.

Table 5. Regression analysis result between ROA and explanatory variables

Virables	Coefficients	Standard error	t-value	p-value
C	0.410	0.054	-7.633	0.083
Natural log of total asset	-0.021	0.003	-6.44	0.098*
Managerial efficiency	-4.807	0.572	-8.403	0.075*
Credit risk	-0.352	0.038	-9.371	0.068**
Liquidity	-0.089	0.023	-3.865	0.161
GDP growth rate	0.180	0.017	10.698	0.089*
Annual inflation	0.139	0.020	7.085	0.059*
R-square	0.8929			
Adjusted R-squared		0.8287		
Prob(F-statistic)		0.0000		
*Significant at 1%; **Significant at 5%; ***Significant at 10%				

Source: Stata output from private banks financial statements.

As it can be seen from the above table, the natural log of total assets (LTA) has a negative impact on profitability and conforms to the a priori restriction. It is statistically significant at 1 present level in the model and it is a vital parameter and a significant driver in banks performance.

This result agrees with Sufien *et al.* (2008) that logarithm of total asset is a variable that measures bank size and is generally used to capture potential economies or diseconomies of scale in the banking sector. Indeed their results on the banks in the Philippines showed that impact of bank size was negatively related to the profitability of Philippines banks, indicating a negative relationship between bank profitability and bank size. Just like the other variables, the size of the Commercial Bank of Ethiopia which was hitherto significant in the model.

The natural log of assets is used instead of assets in order to reduce the scale effect. This variable controls for cost differences related to bank size and for the greater ability of larger banks to diversify. The first factor would lead to positive coefficient for profitability if there are significant economies of scale and the second to negative coefficients if increased diversification leads to lower risk and thus lower required returns.

The coefficient of the credit risk (LLP/TL) variable in the regression model which is an indicator of credit risk, which measures how much a bank is provisioning in year t relative to its total loans, have a negative impact on profitability contrary to the initial a priori assumptions and theory for that matter. This implies that higher credit risks results in lower profit, which in line with our expectation.

In addition this variable is significant at 5 percent level of significance in explaining the variability in the return on assets of Commercial Bank of Ethiopia, a result

which is similar to the results of Miller and Noulas (1997), but is in agreement with Thakor (1987) who were both cited by Sufian and Chong (2008), who suggested that the level credit risk is an indication of a bank's asset quality and signals changes in the future performance.

The provision to total loans ratio is found to have a significant negative impact on banks' return on assets. As discussed in the literature, asset quality is reflected in the ratio. Though banks tend to be more profitable when they are able to undertake more lending activities, yet due to the credit quality of lending portfolios and the general practice in Ethiopia a higher level of provision is needed. Such a high level of provisions against total loans in fact depresses banks' return on assets significantly.

The coefficient of the total operating expense to total asset ratio, efficiency measure, is negative and significant for the period as. The more efficient a bank is, the higher is its profitability. This result meets expectation and stands in line with the results of Athanasoglou *et al.* (2008). The variable is significant at 1 percent level of significance.

The coefficient of the variable representing liquidity ratio (total loans/total assets) is negative and insignificant. This is consistent with theory that liquidity ratio has a negative influence on bank profitability such that high excess liquidity decreases bank profitability and low liquidity improves bank profitability.

Excess liquidity is a sign that bank lending is low and banks are holding more money than statutory required for precautionary purposes. While, low liquidity is a reflection that banks are holding less money in their accounts, an indication of increased lending to the public, and thus implied growth in business and profitability (Saxegaard, 2006) Indeed, excess liquidity of banks negatively influences bank profitability and low levels of bank liquidity improves bank profitability. The result agrees with study conducted by Francis M.E. on Sub Saharan Country (2009).

The impact of gross domestic products (GDP) on profitability was positive and conforms to a priori restrictions; it is a significant driver in the performance of commercial banks of Ethiopia at 1 percent level of significance. This finding conforms to earlier findings by Sufien *et al.* (2008), Kosmidou and Pasiouras (2005), and Hassan and Bashir (2003), which agrees on the positive association between GDP growth and bank profitability and this provides support to the argument of the association between economic growth and the financial sector performance.

Other research findings such by Flamini *et al.* (2009) which points to a non existence between size of economy and profitability of banks as they indicated that banks in Sub-Saharan African performed better in 2006 than their counterparts in high income countries.

All things being equal, the growth of the economy should have a bearing on not only firms in the financial sector but also firms in the non-financial sector.

The results from paper reveals that annual rate of inflation (INF) has a positive impact on profitability, and significant driver in the performance of commercial bank of Ethiopia. The inflation rate shows the strongest impact on banks' return on assets. This may imply that bank management may anticipate the rate of inflation and react accordingly.

These results are similar to those results that are obtained by H, Sudin (2004), Demerguç-Kunt and Huizingha (1999), Toni Uhomoibhi, (2008), and Ben Naceur and Goaid (2010). In addition Sufian (2011) in Korean Banking sector also argues that there is a positive relationship between bank profitability and inflation.

The coefficient of determination (R-squared) is measured the goodness of fit of the explanatory variables in explaining the variations in banks profitability measure ROA. In the regression analysis, the R-Square coefficient of determination is a statistical measure of how well the regression line approximates the real data points.

As clearly described in Table 5 R-squared value for the regression model was 0.8929. This indicates the explanatory variables in this study jointly explain about 89.29 percent of the variation in the profitability measure, return on asset. The remaining 10.71 percent of the variation in the profitability of commercial bank of Ethiopia explained by other variables which are not included the model.

Therefore, these explanatory variables together, are good explanatory variables of the profitability of commercial bank in Ethiopia. Beside this F-statistics (0.0000) which is the used to measure the overall test of significance of the model was presented was good fite.

5. Conclusions and Recommendations

5.1 Conclusions

The main objective of this study is to investigate the determinants of profitability of CBE in Ethiopia. Specific objectives were to determine and evaluate the effects of bank-specific factors and macroeconomic factors. Time-series data of CBE from 2003 to 2015 was analyzed using multiple linear regressions method. In this study, secondary data was analyzed to investigate the major determinant factors of profitability of CBE.

With this data analysis, based on the financial statement of CBE OLS regression methods were used for profitability measure, ROA. In conclusion one can say that the performance of the CBE has been increasing over the decade under study, with some years recording high profitability. This performance compared to the general

performance of banks on the Sub-Saharan African continent which according to an IMF working paper by Flamini *et al.* (2009) on determinants of commercial bank profitability in Sub-Saharan Africa, Bank profits are high in Sub-Saharan Africa (SSA) compared to other regions.

The IMF paper states that this general picture holds true whether profitability is measured as returns on assets, returns on equity, or net interest margins. So Ethiopia is one of the countries in the region where the study is conducted as a result the profitability of CBE is one of the indicator of this result.

So from the result of the analysis the following conclusions have been made:

Natural log of total assets, credit risk, and managerial efficiency are significant key drivers of profitability of Commercial Bank of Ethiopia. And they affect profitability negatively and statistically significant.

Total loan to total asset is statistically insignificant in explaining the profitability of Commercial Bank of Ethiopia even and it has a negative relationship with return on asset of the bank statistical insignificant does not mean that the bank is with excess liquidity rather the banks major loan and advances given to government with low interest rate which minimize the profitability of the bank.

The gross domestic products which measure that size of the Ethiopian economy. According to the regression result, the current real economic growth of the country makes commercial banks to be more profitable.

Regarding inflation (INF) empirical studies suggest that if a bank's income rises more rapidly than its costs, inflation is expected to exert a positive effect on profitability. The study also shows a positive relationship between inflation and banks profitability with statistically significant result.

5.2 Recommendations

In order to hold up risky surprises and maintaining financial stability, it is vital to identify the determinants that mostly influence the overall performance of commercial bank of Ethiopia. Therefore, based on the study results the researcher would like to forward the following recommendations:

- Management bodies of CBE should strive to strengthen the bank specific factors like capital position, managerial efficiency, credit risk, asset quality, and bank size. Because, the competition become tough since increase in new entrant to the market, banks are increasingly being substituted by the general public as a source of funds by new share companies being established in a variety of sectors, and the micro-finance industry continues to show rapid growth.

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- Since different study's shows that there is no relationship between profitability and GDP but, in Commercial Bank of Ethiopia it shows there is a positive relationship between the two variables. Since the GDP of the country is increasing so it plays a great roll in the profitability of the bank. As a result the bank should rely more in internal factor than the external ones.
 - Smirlock (1985) and Pasiouras and Kosmidou (2007) argue that a growing bank size is positively related to bank profitability. This is because larger banks are likely to have a higher degree of product and loan diversification than smaller banks, which reduces risk, and because economies of scale can arise from a larger size. But, Log of natural asset is negatively related to the profitability of Commercial Bank of Ethiopia, hence the bank should have utilize the asset and enhance its profitability from the assets it owns.
 - As many literatures supports financial intermediation in Ethiopia is still in its early stages even by the standards of other low-income countries: more than 90 percent of the population is unbanked (versus an average of 60-70 percent elsewhere in Africa); and many other metrics such as the total number of banks, banks contribution to GDP, bank accounts per person, branches per person, and bank credit per person are lower in Ethiopia compared to other African countries. Thus, CBE should focus to reach this unmet demand of finance by adjusting its strategy with the government regulation.
 - At last, this study investigates the determinants of profitability of commercial bank of Ethiopia. But, the variables included in the study were not exhaustive. Future researchers could include other bank specific and macroeconomic variables such as; market share, government regulation and exchange rates in the regression models.

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