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DETERMINANTS OF BANKS' PROFITABILITY: EVIDENCE FROM BANKING INDUSTRY IN ETHIOPIA

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Abstract

The purpose of this study is to examine the effect of bank-specific, industry-specific and macroeconomic determinants on banks' profitability in Ethiopia. The study applied balanced panel data of eight Ethiopian commercial banks that covers the period of 2002 - 2012. The paper uses ordinary least square (OLS) technique to see the impact of determinants on profitability of Ethiopian commercial banks. The findings of the study show that all bank specific determinants except credit risk and expense management have 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 statistically significant and positive relationship with banks' profitability. The study suggests that bank managers, directors, and all stakeholders should not only be concerned about internal structures and policies, but also must consider the external environment together to improve their bank performance in general and profit in particular.

Keywords: Banking Industry, Determinants, Ordinary Least Square, Profitability, Ethiopia.

INTRODUCTION

The banking industry has experienced some profound changes in recent decades, as innovations in technology and the inevitable forces driving globalization continue to create both opportunities for growth and challenges for banking managers to remain profitable in this increasingly competitive environment. Both internal and external factors have been affecting the profitability of banks over time. Hence, identification and analysis of the determinants of bank

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profitability have attracted for many years the interest of academic researchers as well as bank management, supervisors and financial service participants.

Many researchers in different countries have made investigation on this area by considering the importance and the hot issue of profitability in banking sector. For instance research conducted by Goddard, et al, (2004) by using panel data and dynamic panel estimation to investigate the determinants of profitability in six selected European countries banking sectors: Denmark, France, Germany, Italy, Spain, and the UK, for the period 1992-98. The result suggested that bank- specific determinants and profitability relationship is very strong. Finally they checked there is little evidence of a systematic relationship between industry – specific determinants and profitability.

When we come to previous studies on Sub Saharan African countries, including Ethiopia, Flamini et al. (2009) have made a study on the determinants of commercial bank profitability in the region by using a sample of 389 banks from 41 Sub-Saharan Africa (SSA) countries. The result revealed that the bank – specific, industry – specific and macroeconomic determinants affect the bank return or bank profitability in strong manner. And finally they conclude that Bank profits are high in Sub-Saharan Africa (SSA) as compared to other regions.
As financial intermediaries, banks play an important role in the operation of an economy. This is particularly true in the case of Ethiopia where there is no secondary market exists. Here, banks are the sole providers of funds, and their stability is of paramount importance to the financial system. As such, an understanding of determinants of their profitability is essential and crucial to the stability of the economy.

Although a number of earlier studies have made to add their own contribution to the theory of commercial banks' profitability and stated their own policy implication, they were inclined towards to the developed economy, and less developed countries received little attention in various literatures on this issue. In light of this, Nissanke & Aryeetey (1998) demonstrated that continuous poor performance of banking systems in Africa could be partly explained by the high degree of financial market fragmentation and limited access to basic payment services or savings accounts. Francis (2010) also noted that as the low performance in terms of profitability exists in Sub-Saharan African (SSA) banks. This low profitability levels reflected lack of competiveness and inefficiency in the SSA banking sector. Furthermore, Francis (2010) also noted that as banks' profitability for most of the SSA countries have been about two percent over the last ten years and compares significantly with other developing world, but lower than the developed world. All these studies, among others observed that as more understanding on African banking sector performance was important.

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With the context of the above discussion, specifically in Ethiopia the banking sector is unstudied area, though, few studies have been conducted on financial performance of Ethiopian commercial banks. For instance, study conducted by Semu (2010), Belayneh (2011), Damena (2011) and Mohana & Berhanu (2008) tried to examined the determinants of Ethiopian commercial banks profitability by employing the variables capital, bank size, loan and advance, saving deposit, fixed deposit, non interest income, non- interest expenses and credit risk as bank–specific; market concentration as industry – specific variable and economic growth, saving interest rate and inflation as macroeconomic variable.

So, the theme of this research is to examine the main determinants of Ethiopian commercial banks profitability (bank-specific, industry-specific and macroeconomic) by adding variables employee efficiency and productivity, Regulation, and exchange rate as a determinant of profitability which are not included in previous study. Therefore, this study seeks to fill the gap by providing full information about the internal and external factors that affects profitability by examining the untouched one, and replicating the existing in the Ethiopian context by using all commercial banks operated in the country that had 10 years data.

The remaining part of this study was organized as follows: section two provides the literature review and past researchers of determinants of commercial banks' profitability. This is followed by section three which encompasses the research methodology and section four, which embodies the analysis of the data and its findings. Lastly, section five deduces the implications of the findings, concludes the investigation and suggests new areas of research that can be of contributive significance to the related domain.

LITERATURE REVIEW

A number of studies have examined the determinants of banks' profitability in many countries around the world. Most of the studies consider internal factors (i.e., banks' specific) and external factors (i.e., industry-specific and economic environment) and examine either a particular country or a number of countries. The studies usually expressed bank profitability, as a function of internal and external determinants. A number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study.

Internal determinants of bank profitability can be defined as those factors that are influence by the banks' management decisions and policy objectives. Essentially, company-level determinants of bank profitability comprise characteristics of individual bank companies that affect their profitability. Shareholder and managerial decisions and activities can directly influence these characteristics; hence, they also differ from company to company

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(Athanasoglou, 2006, kasmidou, 2008 and Sufian, 2011). The most frequently used bank profitability determinants which are driven from financial statement include;

Capital Adequacy (CA)

Bank equity capital can be seen in two dimensions as stated by Aburime (2008). Those are the amount contributed by the owners of a bank (paid-up share capital) that gives them the right to enjoy all the future earnings and the amount of owners' funds available to support a bank's business which includes reserves, and is also termed as total share holders' funds. It is measured by the ratio of equity capital to total assets. Bank's capital is widely used as one of the determinants of bank profitability since it indicates the financial strength of the bank (Athanasoglou, Brissimis and Delis, 2005). Aburime (2008) suggested that the bank level of safety achieved through the high capital requirements which generated positive net benefits. The degree of security exceeded the level maximizing net benefits. Capital adequacy requirements generally aim to increase the stability of a national banking system by decreasing the likelihood of a bank failure and a number of negative externalities exist in banking that cause risk to systematically under price. Research conducted by Valentina, Flamini, McDonald and Schumache, (2009) on the determinants of commercial banks profitability in Sub – Saharan Africa by taking 389 sample banks in 41 SSA countries, they measuring profitability by return on asset indicators. They founded that capital adequacy has positive and significant effect on profitability.

Loans and Advances (LOTA)

One of the principal activities of commercial banks is to grant loans to borrowers. Because loans are among the highest yielding assets a bank can add to its balance sheet, and they provide the largest portion of operating revenue. The higher the volume of loans extended the higher the interest income and hence the profit potentials for the commercial banks. Furthermore, it must also be noted that higher interest income are not merely a function of higher volume of loans but are in fact also dependent on the lending rates and the interest rate elasticity of loans as well. The interest rate elasticity of loans will depend on the national affluence or national income (Moin, 2008).The interest raised from the loans is the most important source of the banks' income. However, inherent with bank's loan is liquidity risk as well as credit risk. In this respect, in extending loans, banks should properly manage such risks. In general, it is expected that the more loans, the more interest income, and the more profitable the bank (Sastrosuwito and Suzuki, 2011). Loan and advance is the ratio of loans to total assets. It measures what percent of total assets is comprised by loans and it gauges the percentage of total assets the bank has

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invested in loans (or financings). It is also another important ratio that measures the liquidity condition of the bank in terms of its total assets (Moin, 2008).

Efficiency and Productivity (EP)

In the literature of bank performance, Efficiency and Productivity is the single ratios such as net interest income over total assets, operating expense to operating income, operating expense to total assets and gross income to the numbers of employees had been used to assess manager's and employee's efficiency in banks. Empirical evidence from Athanasoglou, Brissimis and Delis, (2005) shows that labor productivity growth has a positive and significant effect on bank profitability. This suggests that higher productivity growth generates income that partly channeled to bank profits. The commercial banks can target high levels of efficiency and productivity growth both by keeping the labor force steady and by increasing overall output. Ramlall (2009) said the higher the efficiency level of a bank, the higher the profits level.

Credit Risk (CR)

Credit risk is one of the key drivers of banks' profitability because of this; the research examines credit risk as the main determinants of profitability. It is measured by the ratio of loan loss provisions over total loans and advances. The loan loss provisions are reported on a bank's profit and loss account and it is a measure of capital risk, as well as credit quality of the bank. Bobakova (2003) asserts that the profitability of a bank depends on its ability to foresee, avoid and monitor risks, possibly to cover losses brought about by risks arisen. Hence, in making decisions on the allocation of resources to asset deals, a bank must take into account the level of risk to the assets. Most literatures suggest that increased exposure to credit risk is obviously associated with decreased firm profitability (Ommeren, 2011).

Liquidity Risk (LR)

Liquidity risk is another type of risk for banks; when banks hold a lower amount of liquid assets they are more vulnerable to large deposit withdrawals. In other word, liquidity risk arising from the possible inability of a bank to decreases accommodate liabilities or to fund increases on the assets' side of the balance sheet. Therefore, liquidity risk is estimated by the ratio of liquid assets to total asset. Insufficient liquidity is one of the major reasons of bank failures (Ommeren, 2011). Liquidity is the quality of an asset that makes it easily convertible into cash with little or no risk of loss. A bank considered liquid when it has sufficient cash and other liquid assets, together with the ability to raise funds quickly from other sources, to enable it to meet its payment obligation and financial commitments in a timely manner. Following prior research of

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Ommeren, (2011) and Rasiah (2010) a negative relationship between profitability and large liquid assets to customer deposits and short term funding ratio is hypothesize. On the other hand researchers expected a positive relationship between liquidity risk and profitability and concluded that the fewer the funds tied up in liquid assets the higher expected profitability to be (Eichengreen and Gibson, 2001).

Expense Management (EXM)

Is measured by the ratio of operating expense to total assets (e.g. Aburime, 2008) and it is a proxy to management quality. Clearly, efficient cost management is a prerequisite for improved profitability of banks. There is evidence that superior management raise profits and market shares (Berger, 1995 and Athanasoglou, Brissimis and Delis, 2005). According to Athanasoglou, Brissimis and Delis, (2005) investigation on Greek banks during the period 1985 – 2001 observed that Operating expenses appear to be an important determinant of profitability. They find that, there is direct positive relation between efficient expense management (i.e. management quality) and profitability. There is direct negative connection between Operating expenses and profitability of banks; means that there is immediate negative relation between lack of efficiency in expenses management and profitability of banks.

The literature suggests that, the environment in which banks operate influences them, like any firm; from this, the external environment is the common and the uncontrolled one. The external determinants are variables that not related to bank management but reflect the industry-related and macroeconomic environment that affects the operation and performance of commercial banks. External determinants of bank profitability are concerned with those factors, which are not influence by specific bank's decisions and policies, but by events outside the influence of the bank. Several external determinants are included in the performance examination of commercial banks profitability: the financial market structure; the economic condition of the country, the legal and political environment all may influence the performance of the banks (Athanasoglou, Delis and Staikouras, 2006, kasmidou, 2008 and Sufian, 2011). For the purpose of this study, regulation and market concentration as industry-specific determinants and economic growth, exchange rate and interest rates policy as macroeconomic determinants were used.

Regulation (REG)

The banking industry is among one of the most heavily regulated industries in the world. The main reason for regulation is to provide a sound, stable and healthy financial system. Peltzman (1968) was among the first researchers to empirically test the effects of regulation on

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performance. Peltzman's findings indicated that a prohibition on interstate branching and a legal restriction to new entry had a significant impact on the market value of a bank's capital. Commercial banks are stringently regulated by the central bank to prevent failures because of fraud, mismanagement etc. Commercial banks must comply with all applicable laws, such as statutory reserve requirements, liquidity requirements, laws relating to taxation and accounting procedures, opening of new branches, mergers, etc. Frame et al. (1994), as quoted by Devinaga and Rasiah (2010), showed that the banking industry is among the most heavily regulated industries in the world. The main reason why regulations have been imposed on the banking industry is that their healthy operation is critical for the overall economic stability and their failure has a huge negative signaling impact to the economy.

Market Concentration (MCON)

There are different definitions and measurements for market concentration which is given by different banking area researchers. P. Yu and W. Neus (2003) measure the degree of concentration in the banking sector by using the size of bank loans and rely upon the Herfindahl index (HERF). Athanasoglou, Brissimis and Delis, (2005) measure concentration using the 'Herfindahl-Hirschman (H-H) index and they defined it as the difference between the product price and the marginal cost, divided by the product price. On the other hand, A. Dietrich and G. Wanzenried (2009) define the bank concentration variable as the ratio of the three largest banks' assets to the total assets of the entire banking sector. In the normal circumstances, a higher bank concentration might be the result of a tougher competition in the banking industry, which leads to negative relationship between performance and market concentration.

Bank profitability is sensitive to macroeconomic conditions, despite, the trend in the industry towards greater geographic diversification and larger use of financial engineering techniques to manage risk associated with business cycle forecasting (Athanasoglou, Delis and Staikouras, 2006). In addition to banks influence on economic activities, macroeconomic factors also affect the performance of commercial banks in a given country. The following macroeconomic factors are reviewed from different banking area empirical studies.

Economic Growth (GDP)

Economic growth (GDP) is among the most commonly used macroeconomic indicators, as it is a measure of total economic activity within an economy. The GDP per capita growth is expect to have a positive impact on banks' performance, according to the well-documented literature on the association between economic growth and financial sector performance. An important finding of the study is that, the economic growth had positively and significantly affects bank

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profits (Athanasoglou, 2005). This is because the default risk is lower in upturn than in downturn economy. In addition, higher economic growth may lead to a greater demand for both interest bearing and non-interest bearing financial services. Moreover, higher economic growth encourages banks to lend more and permits them to charge higher margins, as well as improving the quality of their assets. Neely and Wheelock (1997) uses per capita income and suggests that this variable exerts a strong positive effect on bank earnings. Demirguc-Kunt and Huizinga (2000), Athanasoglou, Brissimis and Delis, (2005) and Bikker and Hu (2002) by supporting this idea attempted to identify the effect of economic growth (GDP) on bank profitability. All researchers agreed and concluded that positive and strong correlation existed between economic growth (GDP) and bank profitability.

Interest Rate (IR)

A bank's interest rate policy can seen from two perspectives: the bank's policy regarding the interests it pays on deposits received by it and the bank's policy regarding the interests it receives on credits given by it. The interest paid by a bank, on its deposit liabilities is a cost source and tends to contract the bank's income. This is why Fries (2002) argue that the profit function of a bank includes the interest it pays on deposits. On the other hand, the interest received by a bank on credits given by it is a revenue source and tends to expand the bank's income. Hence, Bobakova (2003) argues that the profitability of a bank is influenced by its interest rate policy. This policy can adjust to enhance profitability. Here, the decisive factor is the bank's ability to set such an interest rate for asset deals that meets costs of funds, operating costs, as well as the required rate of profitability.

The real interest rate expected to have a positive relationship with profitability in the essence of lend-long and borrow-short argument (Vong and Chan, 2008). That means banks may increase lending rates sooner by more percentage points than their deposit rates. On the other hand, the rise in real interest rates may increase the real debt burden on borrowers and this may lower asset quality, thereby interest rate may have a negative impact on profitability. However, Guru (2002) attempt to identify the determinants of successful deposit banks in Malaysia. The findings of this study revealed that, among the macro-indicators, high interest ratio was associated with low bank profitability. Interest expenses and interest income, affect net interest income and hence bank profitability. In view of this, interest rates have been considered as determinants of bank profitability in most banking area researches.

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Exchange Rate (ER)

Exchange rates can affect the performance of commercial banks because of their funding and get back in the form of dollar or foreign currency so that the income received is also dependent on the fluctuation of exchange rates is going on. Therefore, the risk of exchange rate plays an important part of the company's profit generated. Abreu & Mendes (2001) identify no impact of effective exchange rate on bank profitability in their study of EU banks. According to Davydenko (2010) the exchange rate depreciation has a positive significant effect on income which could be explained by the ability of banks managers to anticipate exchange rate fluctuations. This could result in gains on foreign exchange transactions. It is important to mention that due to lack of public trust in the domestic currency the demand for foreign currency soar in times of uncertainty allowing banks to earn additional profits. Their study also found that macroeconomic indicators such as inflation, interest rates, money supply, and the exchange rate have a significant effect on the profitability of commercial banks.

In the context of Ethiopia, to the knowledge of the researcher, there appears to be very limited work on the assessment of determinants of profitability of banks. Mohana & Berhanu (2008) were carried out to explore the key determinants of profitability of commercial banks operating in Ethiopia using unbalanced panel data set of banks over the period 1999-2008. In this analysis the fixed effects model is used to control the unobservable bank specific characteristics. The fixed effects model is preferred to the random effect model following the Hausman test, Chi-square =27.6, and P-value =0.005.The result of their study indicates that the most determinants of bank profitability in Ethiopia are the internal factors, factors over which a bank's management has control. Though the external factors are found to be statistically insignificant, their signs have important policy implications, and thus require the attention of policy makers and bank regulators.

A study made by Semu (2010) assessed the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. It also attempted to examine the possible factors that compel the banks to reduce or restrict lending, covering the period of 2005-2009. The findings of the study showed that net deposit and paid up capital have statistically significant relationship with banks' performance measured in terms of return on equity. On the other hand, Damena (2011) examined the determinants of Ethiopian commercial banks profitability. The results showed that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks profitability in Ethiopia. Market concentration was also a significant determining factor of profitability. Finally, with regard to macroeconomic variables, only economic growth exhibits a significant relationship with banks' profitability. Study conducted by Belayneh (2011) examined the determinants of Ethiopian commercial banks

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profitability by employing the bank–specific, industry-specific and macroeconomic variable. The estimation results show that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks' profitability in Ethiopia. Market concentration is also a significant determining factor. Finally, with regard to macroeconomic variables, only economic growth exhibits a significant relationship with banks' profitability.

RSEARCH METHODOLOGY

Model Specification

Extensive literature generally comes to the conclusion that the appropriate functional form for testing is a linear function although there are different opinions. Short (1979) investigated this idea and concluded that linear functions produced as good results as any other functional form. The general model to be estimated is the following linear forms which is adopted from Davydenko, (2010), Athanasoglou, Brissimis and Delis, (2005) prior theoretical model. The equation that account for individual explanatory variables which are specified for this particular study is given as follows.

$$\Pi it = \alpha + \Sigma\, \beta k\, X^{n} it + \varepsilon it;\ \varepsilon = \nu i + \mu it$$

Where: $\boldsymbol{\pi it}$ is the profitability of bank i at time t, with i=1… N, t=1… T, α is a constant term, β is coefficients for the respective variables, $\boldsymbol{Xit}$ is the explanatory variables and $\boldsymbol{\varepsilon it}$ is the disturbance, with $\boldsymbol{\nu i}$ the unobserved bank-specific effect and $\boldsymbol{\mu it}$ the idiosyncratic error.

The challenge facing a researcher is: Which model is better, fixed effect model or random effect model? The answer to this question hinges around the assumption one makes about the likely correlation between the individual, or cross-section specific, error component εi and the X regressors. If it is assumed that εi and the X's are *uncorrelated*, random effect model may be appropriate, whereas if εi and the X's are *correlated,* fixed effect model may be appropriate (Gujarati, 2004). In addition, as noted in Gujarati (2004) if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model. In this case, fixed effect model is preferable than random effect model.

Having the above reality, in this study, a fixed cross-sectional effect is specified in the estimation so as to capture unobserved idiosyncratic effects of different banks. In addition, the number of time series (i.e. 10 year) is greater than the number of cross-sectional units (i.e. 8 commercial banks). On this score, fixed effect model is preferable than random effect model for this particular study.

The study uses the two commonly used ratios to describe bank profitability: the Return on Assets (ROA) and the Net Interest Margin (NIM).

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ROA Model

Return on Assets as dependant variable;

$$ROAit = \alpha + \beta1(CA)it + \beta2(CR)it + \beta3(LR)it + \beta4(LOTA)it + \beta5(EXM)it + \beta6(EP)it + \beta7(REG)it + \beta8(MCON)it + \beta9(ER)it + \beta10(GDP)it + \beta11(IR)it + \varepsilon it \quad .....(1)$$

NIM Model

Net Interest Margin as dependant variable;

$$NIMit = \alpha + \beta1(CA)it + \beta2(CR)it + \beta3(LR)it + \beta4(LOTA)it + \beta5(EXM)it + \beta6(EP)it + \beta7(REG)it + \beta8(MCON)it + \beta9(ER)it + \beta10(GDP)it + \beta11(IR)it + \varepsilon it \quad .....(2)$$

Where: α is a constant term , β1 – β11 is coefficients for the respective explanatory variables, from this; β1 – β6 represent coefficient of bank specific variables, β7 & β8 represent coefficient of industry specific variable, β9 - β11 represent coefficient of macroeconomic variables.

ANALYSIS AND EMPIRICAL RESULTS

Test Results for the Classical Linear Regression Model Assumptions (CLRM)

As noted in Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators. Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not in the model.

Test for Heteroscedasticity

To test for the presence of heteroscedasticity, the popular white test would be employed in this study. This test involves testing the null hypothesis that the variance of the errors is constant (homoscedacticity) or no heteroscedasticity versus the alternative that the errors do not have a constant variance.

In this study, as shown in appendix A, both the F-statistic and Chi-Square versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values were in excess of 0.05. The third version of the test statistic, “Scaled explained SS”, which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression also give the same conclusion that there is no evidence for the presence of heteroscedasticity problem, since the p-value was considerably in excess of 0.05 for both ROA and NIM.

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Test for Autocorrelation

This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). If the errors are correlated with one another, it would be stated that they are auto correlated. To test for the existence of autocorrelation or not, the popular Durbin-Watson test was employed. As noted in Brooks (2008) the rejection / non-rejection rule would be given by selecting the appropriate region from the following figure:

As shows in Appendix B, Durbin-Watson has 2 critical values: an upper critical value (dU) and a lower critical value (dL).

The Durbin-Watson test statistic value of NIM and ROA was 1.9773 and 1.8917 respectively for this particular study. Therefore, the relevant critical values for the test are dL= 1.205, dU = 1.810, i.e., for 80 observations and 11 regressors and 4 - dU = 4-1.810 =2.190; 4 - dL = 4-1.205 =2.795. The Durbin-Watson test statistic result for both NIM and ROA is clearly between the upper limit (dU) which is 1.810 and the critical value of 4- dU i.e.2.190 and thus the null hypothesis of no autocorrelation is within the non- rejection region of the number line and thus there is no evidence for the presence of autocorrelation.

Test for Normality

As noted in Brooks (2008) a normal distribution is defined to have a coefficient of kurtosis of 3. One of the most commonly applied tests for normality; the Bera-Jarque formalizes these ideas by testing whether the coefficient of skewness and the coefficient of excess kurtosis are zero and three respectively. Brooks (2008) also states that, if the residuals are normally distributed, the Bera--Jarque statistic would not be significant at 5% significant level.

The normality tests for this study as shown in Appendix C, the coefficient of kurtosis for both NIM and ROA was close to 3, and the Bera-Jarque statistic had a P-value of 0.833 and 0.934 respectively, which implies that the data were consistent with a normal distribution assumption.

Test for Multicollinearity

To test the independence of the explanatory variables or to detect any multicollinearity problem in regression model the study used a correlation matrix of independent variables. A correlation is a single number that describes the degree of relationship between two variables. In other words, multicollinearity describes the relationship among explanatory variables. The problem of multicollinearity usually arises when certain explanatory variables are highly correlated.

In this study, as shown in Appendix D, correlation matrix between independent variables shows there were fairly low data correlations among the independent variables which indicates

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there is no the existence of multicollinearity problem. Even if, relatively high positive correlation existed between exchange rate and regulation (**0.815**) the researcher ignored this near multicollinearity problem. Because Hailer et al (2006) suggested that multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.9. Accordingly, in this study there is no problem of multicollinearity which enhanced the reliability for regression analysis.

Regression Results

This section presents the empirical findings from the econometric results on the factors affecting bank profitability in Ethiopia and the empirical regression model used in this study and the results of the regression analysis.

Empirical Model

As presented in the third chapter, the empirical model used in the study in order to measure and identify the factors that can affect Ethiopian commercial banks profitability was provided as follows:

ROA Model

Return on Assets as dependant variable;

$$ROAit = \alpha + \beta1(CA)it + \beta2(CR)it + \beta3(LR)it + \beta4(LOTA)it + \beta5(EXM)it + \beta6(EP)it + \beta7(REG)it + \beta8(MCON)it + \beta9(ER)it + \beta10(GDP)it + \beta11(IR)it + \varepsilon it \text{ .....(1)}$$

NIM Model

Net Interest Margin as dependant variable;

$$NIMit = \alpha + \beta1(CA)it + \beta2(CR)it + \beta3(LR)it + \beta4(LOTA)it + \beta5(EXM)it + \beta6(EP)it + \beta7(REG)it + \beta8(MCON)it + \beta9(ER)it + \beta10(GDP)it + \beta11(IR)it + \varepsilon it \text{ .....(2)}$$

From the following tables, the researcher found the following estimated regression;

$$ROA = -0.01 + 0.01(CA) - 0.02(CR) + 0.02(LR) + 0.05(LOTA) – 0.04(EXM) + 0.03(EP) – 0.04(REG) – 0.02(MCON) + 0.01(ER) + 0.02(GDP) + 0.06(IR)... (1)$$

$$NIM = -0.06 + 0.002(CA) – 0.02(CR) + 0.01(LR) + 0.07(LOTA) – 0.01(EXM) + 0.01(EP) + 0.14(REG) + 0.09(MCON) + 0.0002(ER) + 0.03(GDP) + 0.34(IR)... (2)$$

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Table 1: Regression Results for Factors Affecting Profitability (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.007686	0.018299	-0.419996	0.6760
CA	0.009707	0.004981	1.948937	0.0559***
CR	-0.014685	0.008558	-1.715881	0.0913***
EXM	-0.038685	0.004455	-8.684360	0.0000*
EP	0.033127	0.007064	4.689526	0.0000*
ER	0.000700	0.000362	1.931315	0.0581***
GDP	0.020177	0.015088	1.337257	0.1861
IR	0.060361	0.064523	0.935494	0.3532
LOTA	0.048361	0.014715	3.286527	0.0017**
LR	0.023663	0.007904	2.993927	0.0040***
MCON	-0.020455	0.015021	-1.361756	0.1783
REG	-0.038398	0.026978	-1.423327	0.1597
R-squared	0.900597	Durbin-Watson stat		1.872756
Adjusted R-squared	0.871264			
F-statistic	30.70336			
Prob.(F-statistic)	0.000000			

Table 2: Regression Results for Factors Affecting Profitability (NIM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.060589	0.016320	-3.712648	0.0004
CA	0.002350	0.004595	0.511482	0.6109
CR	-0.018585	0.017320	-1.073061	0.2875
EP	0.014225	0.006282	2.264299	0.0271**
ER	0.000142	0.000322	0.442969	0.6594
EXM	-0.008146	0.004141	-1.967226	0.0537***
GDP	0.026482	0.013348	1.983963	0.0518***
IR	0.342090	0.056880	6.014278	0.0000*
LOTA	0.071190	0.013550	5.254013	0.0000*
LR	0.008504	0.008183	1.039321	0.3028
MCON	0.078043	0.012800	6.097068	0.0000*
REG	0.141055	0.024301	5.804619	0.0000*
R-squared	0.905519	Durbin-Watson stat		1.977280
Adjusted R-squared	0.877639			
F-statistic	32.47960			
Prob.(F-statistic)	0.000000			

***, **, and * denote significant at 10%, 5%, and 1% significance levels respectively.

From the ROA regression model result, the R-squared statistics and the adjusted-R squared statistics for ROA was 90.1% and 87.1% respectively, whereas the result shows 90.6% and 87.8% for NIM. The result indicates that the changes in the independent variables explain 87.1% and 87.8% of the changes in the dependent variables i.e. of the ROA and NIM respectively. This means that, equity to total asset ratio, operating expense to gross income

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ratio, credit risk, loan to total asset ratio, liquidity risk, employee efficiency, exchange rate, industry concentration, gross domestic product, regulation and interest rate spread collectively explain 87.1% and 87.8% of the changes in ROA and NIM respectively. The remaining 12.9% and 12.2 % of the changes of the two profitability measure model in this study was explained by other factors which are not included in the model. Thus these variables collectively, are good explanatory variables of the profitability of commercial banks in Ethiopia. The null hypothesis of F-statistic (the overall test of significance) that the R^2 is equal to zero was rejected at 1% as the p-value was sufficiently low. P-value of 0.000 indicates strong statistical significance of the specified model which enhanced its reliability and validity.

The regression result shows that, all bank-specific independent variables had statistically significant impact on ROA. On the other hand, among the five external independent variables used in this model the only significant variable was exchange rate. Among the significant variables, employee efficiency and expense management were significant at 1% significance level since the p-value for both variables were 0.000. Whereas variables like liquidity risk and loan to total asset were significant at 5% significance level. Finally, capital adequacy and exchange rate was significant at 10% significance level since their p-values were in between 0.05 and 0.1. Besides, table also shows that there were inverse relationship between expense management, credit risk, market concentration and regulation against ROA as far as the coefficients for those variables are negative. Thus the increase of those variables will lead to a decrease in ROA while the rest explanatory variables have a direct relationship with ROA as far as their coefficient is positive.

On the other hand, the NIM regression model result showed that, among bank-specific independent variables only employee efficiency, expense management and loan to total asset were statistically significant impact on NIM. All external independent variables used in this model except exchange rate had statistically significant impact on NIM. Among the significant variables, interest rate spread, loan to total asset ratio, market concentration and regulation were significant at 1% significance level since the p-value for both variables were 0.000. Whereas, employee efficiency is significant at 5% significance level. Finally, expense management and real GDP were significant at 10% significance level since their p-values were in between 0.05 and 0.1. Besides, table 4.9 also shows that there were inverse relationship between NIM and expense management and credit risk as far as the coefficients for those variables are negative. Thus the increase of those variables will lead to a decrease in NIM while the rest explanatory variables have a direct relationship NIM as far as their coefficients are positive.

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CONCLUSION

Empirical results from previous studies conclude that internal factors explain a large proportion of banks profitability; nevertheless external factors have also an impact on the performance. A number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study. Based on the review on previous studies and banking area theories, the present study investigated the impact of some selected bank-specific, industry-specific and macro-economic factors on the profitability of the Ethiopian banking industry over the period of 2001 to 2012 and made the following conclusion.

First, a result showed that a positive relationship between banks capital and profitability and had a statistical significance for Ethiopian commercial banks profitability. This is in line with the expectation as a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability. Accordingly, it also indicates that well capitalized Ethiopian banks face lower costs of going bankrupt, which reduces their cost of funding or that they have lower needs for external funding which results in higher profitability. Moreover, it's interesting to note that higher capital level brings higher profitability for Ethiopian commercial banks since excess capital can be provided as loans.

Second, the empirical finding showed that a negative and strongly significant impact of credit risk on banks profitability as expected. This implies that an increase in the ratio of nonperforming loans to gross loans, certainly lead to a decrease in profitability of Ethiopian commercial banks.

Third, the result showed that, the coefficient of the ratio of operating cost to gross income, which provides information on the efficiency of the management regarding expenses relative to income, was negative and statistically significant for both ROA and NIM. This showed that minimizing commercial banks operating costs in Ethiopia would certainly improve the banks performance in general and profitability in particular.

Fourth, as the result showed, the coefficient of employee and productivity was positive and statistically significant at for both ROA and NIM which is in line with a prior expectation and makes the variable an important determinant of Ethiopian banks profitability. This implies that an increase in the ratio of profit before tax to number of employees, certainly lead to an increase in profitability of Ethiopian commercial banks.

Fifth, the coefficient of loans to total asset has positive and statistically significant. The positive relationship between total loans and profitability implies that, as the ratio of total loans and advances to total asset increases, the profitability of Ethiopian commercial banks also increases. This result is consistent with the previous finding of Sastrosuwito and Suzuki (2011)

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as they conclude that, it is expected that the more loans, the more interest income, and the more profitable the bank.

Sixth, the coefficient of liquidity risk is positive and statistically significant. The implication of this finding is that investing in short-term, less risky securities like government bonds leads to increased profitability.

Continuing to industry concentration, as the regression result for ROA shows that, there exists a statistically insignificant and negative relation between the market concentration and the bank profitability in Ethiopia. However, the outcome of NIM regression shows that the coefficient of market concentration is positive and statistically significant even at 1% significance level. Therefore, conclusion about the impact of Ethiopian commercial banks concentration on their performance remains ambiguous and further research is required.

The regression result of NIM indicate that, regulation has positive coefficient and statistically significant. This shows that, if banks taking on the higher degree of risk are profitable, then depositors and shareholders gain and if the banks fail, depositors lose, risk return trade off. On the other hand, the regression result of ROA shows that, regulation has an inverse relationship with Ethiopian commercial banks profitability though it is statistically insignificant. The inverse relationship between regulation and ROA shows that, as the reserve requirement ratio increase/decrease, the Ethiopian commercial banks profitability also decrease/increase.

Turning to macroeconomic variables, the coefficient of real GDP was positive as expected. This implies that, Ethiopian banks profitability was positively related to the GDP growth, mainly through the impact of the economic cycle on the demand for credit by households and firms. The study also justified a positive and significant impact of Ethiopia real GDP growth on Ethiopian commercial banks as the current stimulated economy could create a new and potential demand for financial services in the country.

The regression result of ROA shows that, interest rate (spread) has a positive relationship with Ethiopian commercial banks profitability though it is statistically insignificant. On the other hand, the result of NIM indicate that the spread has positive coefficient and statistically significant even at 1% significance level. This implies that, as the spread increases/decrease, the profitability of Ethiopian commercial banks certainly increases/decrease. The positive relationship suggesting that as far as lending interest rate is greater than saving interest rate, it provide positive return to the profitability of the banks. Therefore, interest rate policy is one of the basic macroeconomic determinants of Ethiopian commercial bank profitability.

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Finally, the coefficient of exchange rate was positive even though it is statistically insignificant as the regression result of NIM shows. However, statistical result for ROA shows, there is a positive relationship between exchange rate and Ethiopian commercial banks profitability which is statistically significant at 10% significance level. This implies that, as the value of Ethiopian birr depreciated against USD, the profitability of Ethiopian commercial banks increases. The result of this finding is in line with Davydenko (2010) as he concluded that the exchange rate depreciation has a positive significant effect on income which could be explained by the ability of banks managers to anticipate exchange rate fluctuations. This could result in gains on foreign exchange transactions. This outcome is also in line with the available information on significant gains of Ethiopian commercial banks from foreign exchange transactions during the study period 2002-2012. Therefore, exchange rate is one of the most determinants of Ethiopian commercial bank profitability.

This study has certain limitations as it was difficult to get related documents for empirical evidence as well as well compiled data for analysis. In this study, the author has seen few macroeconomic variables which influence the profitability of commercial banks in Ethiopia. Thus, to endorse the work, future research could incorporate external factors such as government tax policy which shows the ability of banks manager to allocate its portfolio to minimize its taxes, ownership (to indicate private and public banks differently) and unemployment rate.

POLICY IMPLICATIONS

Based on the findings of the study, the following possible recommendations were forwarded:

As one can observe from this study, both internal and external factors determine commercial banks profitability in Ethiopia. Thus, bank managers, directors, and all stakeholders should not only be concerned about internal structures and policies, but also must consider both the industry specific and the macroeconomic environment together in designing out strategies to improve their bank performance in general and profit in particular.

To curb the impact of credit risk, Ethiopian commercial banks should strive to improve their inspection techniques and loan application methodologies in screening potential borrowers because the existing credit risk trend may bring a series collapse against the sector as well as the nation economy in general.

In order to maximize the bank's profitability, bank managers and directors should reduce the operating expenses. Although it will drive up the unemployment rate, banks need to use high tech machines like ATM and mobile banking which reduces duplication of man power in the industry. Other than that, banks should also regulate the operating expense policy and manage

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the expenses in each department, so that it helps to reduce the cost of banks and maximize the profitability of banks.

In order to maximize profitability of bank, Ethiopian commercial banks should lower the liquidity ratio to increase the income from loan. In other words, a bank could reduce the cost of loan to increase the lending to the public thereby reduce cash tied up to liquid asset. Therefore, the bank could increase its profitability.

Policies aimed at controlling exchange rate, interest rate policy and gross domestic product should be given priority in fostering Ethiopian commercial banking sector as far as these factors are the main determinants for the health of the nation's economy in general and bank profitability in particular.

Government regulation which forced banks to preserve about 15% of the total deposit is currently affecting the Ethiopian commercial banks profitability. So the government needs to revisit its policy or it should take some corrective actions like paying at least equal interest with that of the deposit which was offered for loans in order to enhance the performance of the sector in general and the profitability in particular.

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APPENDICES

APPENDIX A: TEST FOR HETEROSCEDASTICITY

Heteroskedasticity Test for ROA: White

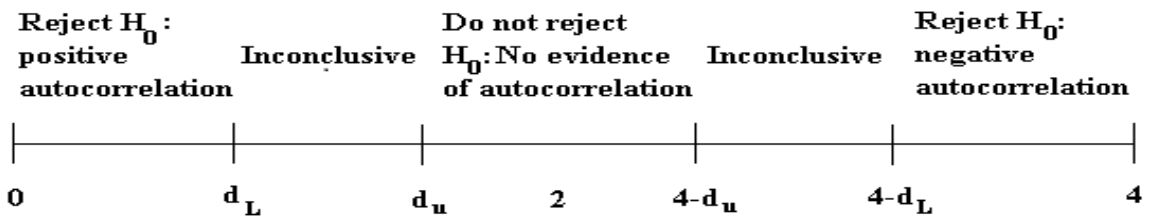
F-statistic	2.932612	Prob. F(72,7)	0.0676
Obs*R-squared	77.43294	Prob. Chi-Square(72)	0.3096
Scaled explained SS	47.48492	Prob. Chi-Square(72)	0.9886

Heteroskedasticity Test for NIM: White

F-statistic	1.256896	Prob. F(72,7)	0.4066
Obs*R-squared	74.25621	Prob. Chi-Square(72)	0.4046
Scaled explained SS	66.43507	Prob. Chi-Square(72)	0.6629

APPENDIX B: TEST FOR AUTOCORRELATION

Rejection and non-rejection regions for Durbin-Watson Test



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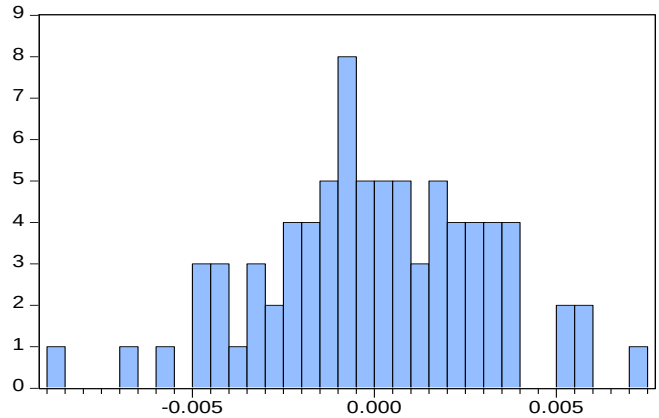
APPENDIX C: TEST FOR NORMALITY

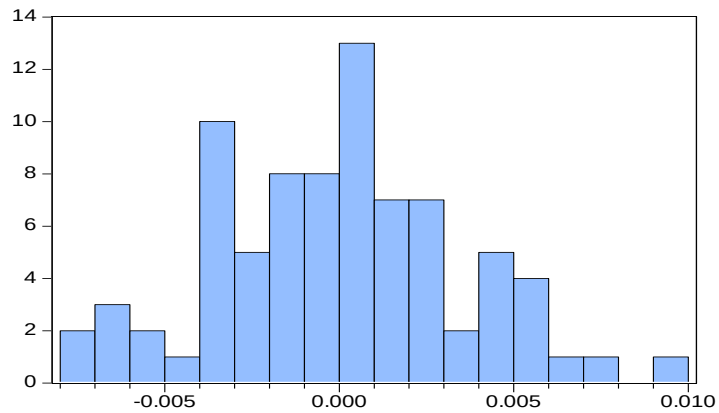
Normality test for NIM



Series: Standardized Residuals
Sample 2002 2011
Observations 80

Mean	0.000000
Median	-0.000160
Maximum	0.007349
Minimum	-0.008682
Std. Dev.	0.003031
Skewness	-0.161177
Kurtosis	3.076476
Jarque-Bera	0.365867
Probability	0.832824

Normality test for ROA



Series: Standardized Residuals
Sample 2002 2011
Observations 80

Mean	9.49e-20
Median	0.000230
Maximum	0.009683
Minimum	-0.007696
Std. Dev.	0.003523
Skewness	0.076982
Kurtosis	2.867990
Jarque-Bera	0.137105
Probability	0.933744

APPENDIX D: TEST FOR MULTICOLLINEARITY

Correlation matrixes of independent variables

	CA	CR	EP	ER	EXM	GDP	IR	LOTA	LR	MCON	REG
CA	1.000										
CR	-0.223	1.000									
EP	-0.050	0.142	1.000								
ER	0.240	-0.218	0.397	1.000							
EXM	-0.078	0.291	-0.288	-0.446	1.000						
GDP	0.039	-0.099	0.363	0.278	-0.415	1.000					
IR	0.287	-0.429	0.053	0.172	-0.252	0.236	1.000				
LOTA	-0.014	-0.274	-0.195	-0.553	0.294	-0.161	0.387	1.000			
LR	-0.221	0.280	0.086	0.309	-0.140	0.089	-0.044	-0.589	1.000		
MCON	-0.098	0.200	-0.469	-0.709	0.553	-0.657	-0.387	0.378	-0.262	1.000	
REG	0.168	-0.214	0.402	0.815	-0.451	0.370	0.353	-0.455	0.310	-0.868	1.000

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