DETERMINANTS OF PROFITABILITY OF COMMERCIAL BANKS IN A DEVELOPING COUNTRY: EVIDENCE FROM ETHIOPIA

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ABSTRACT

The study was 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 1999/00-2008/09. To this end, internal and external factors to the banks are regressed against the ROAA of the commercial banks. The internal factors considered are related to the bank’s capital structure, liquidity, credit risk, loan portfolio, asset quality, and expense management aspects whereas the external factors are related to the industry and the macroeconomic scenarios within which the banks operate. 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 the 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.

KEY WORDS: Capital Structure, Credit Risk, Loan Portfolio, Asset Quality And Expense Management

INTRODUCTION

The profitability of a bank may be influenced by certain factors. Some of these factors may have a positive impact on the bank’s profitability while the others could have a negative impact. From the point view of controllability, some of the factors that affect the profitability of a bank could be under the control of the bank’s management and the others could be beyond its control.

Those factors over which a bank’s management has control are referred in the banking literature as bank specific or internal factors. They are so called bank specific or internal factors because depending on the likely impact they have on the profitability of the bank they can be reinforced (positive treatment) or weakened (negative treatment) by the management of the bank. Generally, these factors may relate to
a bank’s overall managerial practices on capital structure, liquidity management, credit risk, loan portfolio management, expense management and diversification of a bank’s line of products or activities. Those factors over which the management of a bank lacks control are external to the bank. These factors generally relate to the industry and macroeconomic variables within which the bank operates.

The external factors may include factors related to the level of competition in the industry to which the bank belongs (concentration), barriers related to entry to and exit from the industry, the pace of economic growth, the nature of the regulation and supervision of the banking industry, inflation, financial deepening, and monetary and physical policies, among others.

Thus, apart from the management of a bank, knowledge of the underlying internal and external factors that affect the financial performance of a bank is vital for policy makers and bank supervisors and regulators in framing future policies aimed at improving the profitability of the banking sector (Kosmidou, 2008; Sufian and Chong, 2008).

The present study aims at examining the key determinants of bank profitability in Ethiopia. The study of determinants of bank profitability in Ethiopia could be justified on three grounds. The first could be related to the limited stock of knowledge on determinants of bank profitability in Ethiopia. Though determinants of bank profitability are thoroughly examined in developed and emerging countries, studies related to determinants of bank profitability in Ethiopia are scarce, if not none. Previous studies on Ethiopian banks have emphasized on other aspects of bank performance. For instance, Kapur and Gualu (2012) study the relationship between ownership structure and profitability of commercial banks in Ethiopia. Kiyota et al (2007) study the case for financial liberalization in Ethiopia. Another study by Flamini et al (2009) on bank profitability has considered Ethiopian banks as part of a larger sample pooled across a number of Sub-Saharan countries.

The second could be related to the lack of consensus in the banking literature on the factors that affect bank profitability. For instance, the literature is inconclusive as far as the impact of bank size on bank profitability is concerned. While Kosmidou et al (2006) for UK banks, Sufian, F. and Habibullah (2009) for Bangladeshi banks, Kosmidou (2008) for Greece banks, have found economies of scale for larger banks, Sufian and Chong (2008) for Philippines banks, Funacova and Poghosyam (2011) for Russian banks, Pasiouras and Kosmidou (2007) for domestic banks in Europe, Dietrich and Wanzenried (2011) for Banks in Switzerland have found diseconomies of scale for larger banks. The impact of liquidity on bank profitability is also inconclusive in the banking literature. Haron (2004) for Islamic banks, Kosmidou et al (2006) for UK banks, and Pasiouras and Kosmidou (2007) for EU domestic banks have found positive association between liquidity and bank profitability (ROA) whereas Dietrich and Wanzenried (2011) for banks in Switzerland, and Funacova and Poghosyam (2011) for Russian banks have found negative association between liquidity and bank profitability (ROA). This implies that the determinants of bank profitability are not conclusive and same across countries. Thus, the particular factors that influence the profitability of the commercial banks need to be identified on a country base.
The third could be related to the growth and development of the Ethiopian banking sector. The Ethiopian banking sector has shown a rapid progress in terms of number of commercial banks, total assets, and capital over the last decade or so. The commercial banks are also widening their branch network and increasing their outreach to remote areas. While banks in the developed world are hit by the financial crisis and crippled in the bailout token, commercial banks in Ethiopia have been continuously reporting profits of different magnitude. To this effect, a study on determinants of profitability of commercial banks operating in Ethiopia is impressing as its findings will help bank managers, policymakers, bank supervisors, and regulators to frame policies aimed at maintaining the growth momentum of the banking sector in the country. In the view of all these, the study contributes its share to the literature in general and the development and growth of the banking sector of Ethiopia in particular by identifying the key factors that affect the profitability of Ethiopian commercial banks.

The remainder of the paper is organized as follows: section two presents review of related literature; section three presents the data set and the methodology used; section four presents the findings of the study, and; section five concludes the study.

Review of Related Literature on Determinants of Bank Profitability

Determinants of bank profitability have been thoroughly examined for banks operating in the developed and emerging economies. However, such studies are extremely rare for banks operating in Ethiopia. Thus, in this section, studies on determinants of bank profitability carried out elsewhere are briefly accounted for.

Obviously the lion’s share of credits in the banking industry analysis goes to Berger. Berger (1995) took a sample of US banks for the period 1983 to 1992 and used the Granger Causality model to investigate the association between return on equity (ROE) and capital to asset ratio, and found that the returns on equity and capital to asset ratio were positively correlated. Similar to the findings of Berger (1995), Naceur and Goaied (2001) that examined the factors that affect the performances of Tunisian banks for the period 1980 to 1995 have found a positive association between bank profitability and equity to asset ratio.

Dietrich and Wanzenried (2011) carried out a study to identify the factors that influence the profitability of commercial banks in Swaziland for the period 1999 to 2006 by taking data from 453 banks. They used ROAE and ROAA alternatively as dependent variables and considered eleven bank-specific and five industry-specific and macroeconomic factors as explanatory variables in their analysis. The study found a positive and significant relationship between bank profitability (measured in terms of ROAA) and equity to total assets as well as GDP growth rate, whereas bank size and cost to income ratio were found to be negatively and significantly associated with bank profitability. Moreover the study revealed that private banks were more profitable than state-owned banks.
Guru et al. (1999) studied to examine the factors that influence successful deposit banks by taking a sample of seventeen Malaysian commercial banks for the period 1986 to 1995. The study considered both micro and macro variables as determinants of profitability. The micro determinants included liquidity, capital adequacy and expenses management and the macro factors included ownership, firm size and external economic conditions. The study indicated that efficient expense management (among the micro variables) and inflation (among the macro variables) are found to be the most significant factors affecting bank profitability in Malaysian.

Flamini et al. (2009) took a sample of 389 banks in 41 SSA countries to examine the determinants of bank profitability and explore the relationship between profits and equity in the region. To do that they considered a number of bank specific and macroeconomic variables including credit risk, activity mix, capital, bank size, market power, GDP growth and inflation as factors to influence bank profitability in the region. They found that higher returns on assets were associated with large bank size, activity diversification, and private ownership, and that banks returns were also affected by macroeconomic variables.

Kosmidou (2008) undertook a study to examine the factors that affect the performance of Greece Banks for the period 1990-2002 using unbalanced time series data of 23 banks. A number of internal and external factors were considered in the study and were regressed against the banks’ ROAA. The study finds that ROAA was positively correlated with high capital and lower cost to income ratio as well as with size and the growth of GDP. Moreover it was found that inflation had significant negative effect on performance.

Badola and Verma (2006) undertook a study to examine the major determinants of profitability of public sector banks in India using data over the time period 1991-02 to 2003-04. They considered net profit as dependent variable and spread (S), non-interest income, Credit/deposit ratio, Non-performing assets as a percentage to Net advances, Provision and contingencies, operating expense, business per employee as independent variables in their analysis. The study found high degree of association between profitability and the independent variables.

An empirical study by Haron (2004) attempted to examine the impact of different factors on the profitability of Islamic Banks. The study considered total income to total assets, net profit before tax to total assets, net profit before tax to capital and reserves, net profit after tax to capital and reserves as dependent variables in the analysis. Moreover, the study took into account a number of internal and external factors such as total financing to total deposits, total capital and reserves to total assets, total deposit in current accounts to total assets, total deposit in investment accounts to total assets, total funds in profit sharing principles to total assets, total funds in mark-up principles to total assets, income from financing activities to total financing, bank’s share of income to total savings and investment deposits, total expenditure to total assets, staff expense to total assets, provision for loan loss to total assets, other expenses to total assets, money growth supply (M2), inflation, dummy variable ( 1 if a bank operates in a monopolistic market) market share, consumer price index, size as explanatory variables. The study
revealed positive relationship between profitability, and liquidity, capital structure, and money supply while an inverse relation between profitability and asset structure and market share. Moreover, the study found mixed result with regard to the impact of size on bank profitability.

Park and Weber (2006) carried out a study to examine the major determinants of profitability of Korean banks over the period 1992-2002 and test the market structure hypothesis against the efficient structure hypothesis. Their study is unique in that, in addition to the proxies of efficiency that are often used by many researcher, they made use of technical inefficiency scores of the banks estimated using directional distance function in explaining bank performance in Korea. In estimating the technical inefficiency they used three inputs (labor, capital and deposits) and three outputs (commercial loans, consumer loans, and securities). The proxies that they used for operating efficiency include operating expense per employee (log) and operating expense per branch (log) that of asset inefficiencies are total asset per employee (log) and asset per branch (log). They alternatively used ROA and ROE as measures of bank profitability in their analysis. Their study reveals that market share has a significant positive impact on bank profitability, favoring the market structure /conduct/performance hypothesis. However, when they controlled bank efficiency, they found market share to have insignificant impact on profits, providing evidence in support of the efficient structure hypothesis. Contrary to the market structure hypothesis they found concentration to have a negative impact on bank profitability over the entire period. They also found that banks with a greater net interest margin, lower operating cost per employee or branch, less technical inefficiency, a higher equity capital ratio, a smaller non-performing loan share are found to be more profitable

Pasiouras and Kosmidou (2007) made a study to examine the factors that influence the profitability of commercial domestic and foreign banks in the 15 European Union countries using bank data over the period 1995-2001. In their analysis they measured bank profitability by ROAA and considered a number of internal and external factors. In their study they found that capital strength (equity to asset ratio) and efficiency management (cost to income ratio) as the most determinant factors of profitability of both domestic and foreign banks; while equity to asset ratio is positively related with profitability, cost to income ratio is negatively associated. Moreover, their study indicates that liquidity is statistically significant and positively related to the profitability of domestic commercial banks, but liquidity is statistically significant and negatively related to foreign banks. Their study also finds negative association between bank size and profitability of both domestic and foreign banks. Though inflation growth and GDP growth rates are statistically significant and are positively related to the profitability of domestic banks, they are negatively related to foreign banks. Moreover, their study indicates that while concentration is statistically significant and negatively related to domestic bank profitability; it is statistically significant and positively related to foreign bank profitability.

Funacova and Poghosyam (2011) examined the determinants of bank interest margin in Russia with a particular emphasis on bank ownership structure. All banks that were operating in Russia during the period 1999-2007 were included in their study. In the study personnel costs to total assets is found to have statistically significant and positive correlation with bank interest margin, indicating that
operational costs incurred by banks are transmitted to their clients through higher margins for their financial services. In the study the equity to asset ratio is also found to have significant positive impact on bank interest margin which shows that banks with higher risk aversion tend to set higher margins. According to the result of their findings, bank size, liquidity and the proxy for credit risk (non-performing loans to total loans) are all statistically significant and negatively correlated with interest margin. The negative association between bank size and interest margin reflects the presence of economies of scale in Russia as larger banks tend to have lower margins. They explained the negative relationship between the proxy for credit risk and interest margin using the market structure discipline, and thus, the negative association reflects that depositors require a higher premium for depositing their saving in banks with higher non-performing loans ratio, establishing a negative relationship between non-performing loans and interest margin. More interestingly, they found that the factors that affect bank interest margins vary by ownership. While personnel costs to total assets ratio (positive), equity to asset ratio (positive), concentration (positive) and bank size (positive) are the most determinants of foreign banks interest margin, the determinants of state owned banks interest margin include personnel costs to total assets ratio (positive), equity to asset ratio (positive), and non-performing loans to total loans (positive), and that of the domestic private banks include personnel costs to total assets ratio (positive), equity to asset ratio (positive), non-performing loans to total loans (negative), bank size (negative) and liquidity (negative).

A study carried out by Sufian and Chong (2008) examined the key factors that influence the profitability of banks in Philippines during the period 1990-2005. Their study indicates that all the bank specific variables are the major determinants of bank profitability in the country. Particularly, the result of their finding reveals that bank size, credit risk, inflation, and expense preference behavior have negative impact on bank profitability in Philippines whereas diversification and capitalization have positive impact. However, economic growth, money supply, and stock market capitalization are found to have no significant impact on the profitability of banks in Philippines.

Kosmidou et al (2006) examined the factors that affect the profitability of UK domestic commercial banks from the period 1995-2002. Their finding indicates that capital strength is the most significant factor that positively affects UK owned commercial banks’ profitability. Moreover, factors such as efficiency management in expense and bank size are also factors that have influence on the profitability of domestic UK commercial banks. More specifically, their study shows that cost to income ratio and bank size have a significant and positive impact on both measures of UK’s bank profitability (ROAA and NIM). Their study also indicates that liquidity has a positive effect on ROAA but a negative effect on NIM, and loan loss reserve to total loans has positive and significant on NIM but has no significant impact on ROAA. Moreover, all the external factors considered in the study are found to individually have significant impact on UK’s bank profitability: they found economic growth, concentration, and inflation to have positive and significant impact on bank performance. The positive association between concentration and bank profitability supports the SCP hypothesis and shows the oligopolistic nature of UK’s banking sector.
Sufian and Habibullah (2009) examined the determinants of commercial bank profitability in Bangladesh using the data of 37 banks over the period 1997-2004. The result of the study indicates that loans intensity, credit risk and cost are the bank specific factors that have positive and significant impact on the profitability of Bangladeshi commercial banks. However, the finding of the study is inconclusive with regard to the impact of size on profitability. While size is found to have positive and significant impact on ROAA and NIM, its impact on ROAE is negative and significant. As far as the external factors are concerned, the study indicates that such factors have no significant impact on the profitability of commercial banks in Bangladesh.

DATE SET AND METHODOLOGY

Data Source

The study makes use of the annual audited financial statements of Ethiopian commercial banks over the period 1999/2000-2008/2009. The audited financial statements of the banks over the study period have obtained from National Bank of Ethiopia, the country’s central bank. Data related to macroeconomic variables are obtained from World Economic Indicator.

Determinants of Profitability and Variable Selection

Variable Specification: Dependent Variable

Net interest margin (NIM), return on average assets (ROA) and return on average equity (ROE) are the most frequently used ratios in measuring bank profitability in the banking literature. Studies that explore the factors that influence the profitability of banks use one or a combination of these ratios alternatively as measures of bank profitability in their analysis.

Ratios (net profit to total asset, net profit to equity, and NIM) instead of the real value of profits are used in measuring bank profitability because ratios are not influenced by variations in the general price level (Guru et al, 1999). To recap Guru et al., while ratios are time invariant, the real value of profits may be affected by the time varying inflation rates. That is, ratios are time invariant because both the numerator and the denominator in the period-t would be measured in monetary terms based on period-t price levels.

The choice of the profitability ratios (ROA, ROE, and NIM) depends on the objective of the profitability measure since the end of each of the profitability measures differ. The return on assets (the ratio of net profit to total assets) measures the capability of bank’s management to make profits from its assets. It is a good indicator of how well a bank’s management is managing the assets of the bank. According to Rivard and Thomas (1997), bank profitability is best measured by ROA for two primary reasons. According to them, one of the primary reasons is that ROA is not distorted by high equity multipliers and the second is that ROA reflects a better measure of a bank’s ability to generate returns on its assets. Moreover, ROA takes account of the disparity in the absolute magnitude of the profits that may be related to size (Guru et al, 1999). In contrast, the return on equity (ROE), the ratio of net profit to equity, measures the extent to which the bank’s management is generating returns using the equity of the
bank’s shareholders. And, that of the net interest margin, which is computed as a percentage of earning assets, reflects the extent to which a bank’s earning assets are profitable.

Another problem related to ratios particularly with ROA and ROE is that the total values of assets and equity may not remain constant overtime. Thus, taking only the ending balance of a given year may be problematic. To account this problem, average values of consecutive year-end balance sheet figures are normally used. Thus, following the footpaths of previous studies (Kosmidou, 2008; Dietrich and Wanzenried, 2009; Fu and Heffernan, 2010;) and taking into account the profitability measures of commercial banks used by NBE\(^3\), ROAA is used to measure the profitability of the commercial banks in the study.

Another important issue that has to be considered in measuring bank profitability is related to the choice between pre-tax and post-tax profits. However, in studies that are limited to the boundaries of one nation, the choice between pre-tax and post-tax profits may not be very important because all the banks will be required to pay tax as per the country’s corporate tax law which is equally applicable to all the banks (Guru et.al., 1999). Therefore, since the commercial banks under consideration are subject to the same tax law in the country, the net profit (profit after tax) has been used as numerator in computing the ROAA\(^4\).

Generally, the profit after tax as a percentage of average assets (ROAA) is considered as a measure of the dependent variable (bank profitability) in the study.

**VARIABLE SPECIFICATION: INDEPENDENT VARIABLES**

Often bank profitability measures (ROA, ROE and NIM) are expressed as a function of certain internal and external factors. That is, banks are influenced by factors some of which emanate from within its internal environment and some from the external environment.

**Internal Factors**

Internal factors are factors that the bank managers have control. That is, internal factors are those that are often influenced by policies and decisions of a bank’s management. The internal factors basically reflect differences related to policies and decisions of a bank’s management with regard to sources and uses of funds, capital, liquidity and expense management. Thus, the impact of internal factors on bank profitability can be analyzed by looking at the balance sheet and income statement of the concerned commercial bank.

Within the context of the internal factors, up on which bank’s management has control, the immediate factors that would have an impact on bank profitability are those factors that affect a bank’s net interest income. As the study indicates, on average, net interest income accounts percentage of the

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\(^3\) NBE uses the value of average assets as denominator in measuring the profitability of commercial banks

\(^4\) Usually the ROAA is expressed in terms of percentage as: \((\text{Net profits/Average assets}) \times 100\%\)
total income of Ethiopian commercial banks over the period 1999/00-2008/09. This means that the
interest rates charged on loans and the different forms of deposits could be expected to have a significant
impact on the profitability of commercial banks in Ethiopia. However, since it is extremely difficult to
obtain these rates from the balance sheet and income statement of the commercial banks, the volume of
loans and volume of deposits are used as a proxy to measure the efficiency of assets and liability
portfolio management, respectively. Moreover, commercial banks are also exposed to a variety of risks
such as interest rate risk and credit risk. It is, therefore, obvious that the attitude of the management of a
bank towards risk would have an impact on the profitability of the bank. To that end, the risk inherent in
a bank and its management’s attitude towards risk can be analyzed by examining the equity a bank
chooses to keep and its liquidity management policies.

External Factors

External factors are those that are related to industry specific and macroeconomic scenarios that
reflect the economic and legal environment within which the commercial banks operate. To this effect,
external factors are those factors that are beyond the control of the management of a bank.

With the context of external factors, which are beyond the control of a bank’s management, the
environment within which a bank operates and the industry to which it belongs would be expected to
have an impact on the profitability of the bank. To this effect, the external factors can be analyzed by
examining the overall economic scenario within which a bank operates as well as the characteristic of the
specific industry which the bank belongs to.

Generally, after a thorough review of the related literature on determinants of bank profitability,
the study has considered 7 internal and three external factors. These factors are expected to influence the
profitability of commercial banks in Ethiopia. The internal factors include capital adequacy, liquidity,
credit risk, net loans to total assets, diversification, loan loss reserve to total loans, and cost to income
ratio. The external factors include market concentration, GDP growth rate and inflation rate. Table
summarizes the operational definition of the dependent variable/s and external variables. Brief accounts
of the internal and external factors are given below.

Capital Adequacy (Eqas)

Capital adequacy reflects the capital strength or capital structure of a bank. In the banking
literature equity to asset ratio is often used as a proxy for capital adequacy. As this ratio is a measure of
capital strength\(^5\), commercial banks with high equity to asset ratio are relatively assumed to be safe in the
event of loss or liquidity. This is so because if a bank faces a serious asset quality problem and its loan
loss reserves are not sufficient to write off the bad loans, the bank will be able to write off the balance
using shareholders’ equity. Thus, taking into account the risk-return hypothesis, equity to asset ratio and
bank performance would obviously be negatively associated. On the other hand, banks with higher

\(^5\) (Kosmidou et al., 2008) articulated that bank’s capital strength provides the ultimate line of defense
against the risk of insolvency while loan loss reserves and cumulative loss reserves provide early lines
of defense against bad loans
equity to asset ratio will have lower risk and this would enhance their credit worthiness. As a result, they will have lower cost of funding. In addition, banks with high equity to asset ratio will have lower needs to solicit external funding. Thus, banks with high equity to asset ratio will have more profitability from this point of view. Thus, it is difficult to determine the expected sign that equity to asset ratio will have with profitability, and is subject to empirical examination.

Liquidity\(^6\) (Lqty)

The liquidity of a bank is measured by the ratio of liquid assets\(^7\) to deposits\(^8\) (NBE). This ratio shows the capacity of a bank to meet payments as and when its depositors and other suppliers of funds require. The lower ratio of this reveals that the bank will face difficulty in meeting payments in the right time and hence its liquidity low. A lower ratio of this, then, would mean that the bank will not effortlessly get funds or else it will have to incur an extremely high rate of interest which will mount the cost of funding and eventually impinge on the profitability of the bank unfavorably. On the other hand, an extremely higher ratio of this would mean that the bank has kept excess liquid assets inactive and hence losing interest income. This makes the prediction of the sign difficult and it is, therefore, subject to empirical investigation.

Net Loans to Total Assets (Nlta)

The ratio of net loans to total assets, which represents the proportion of assets that encompass the loan portfolio, is an important financial ratio that may indicate how well a bank is financially operating to enhance its interest income. Though a high ratio of this may mean that the bank is making use of its assets productively and hence doing well owing to increases in interest income, an extremely high ratio of this may hamper the liquidity of the bank as well. This implies that it is difficult to predict the sign and hence is subject to empirical investigation.

Operational Efficiency (Cin)

In the banking literature cost to income ratio is used as a proxy for bank’s operational efficiency or expense management. The cost to income ratio is considered as an explanatory variable since it shows how a bank’s management is operationally cost efficient in managing the affairs of the bank which will eventually have an impact on the bank’s profitability. Since cost to income ratio measures the cost of running a bank as a percentage of income, a high ratio of this reflects that the management of the bank is operationally inefficient in controlling costs. This will eventually have an undesirable effect on the profitability of the bank. Thus, the cost to income ratio, which is a proxy for operational efficiency, is predicted to have a negative relationship with profitability.

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\(^6\) It shows the percentage of bank customer deposits that could be met if they were abruptly withdrawn

\(^7\) As per the definition of NBE liquid assets include cash on hand, cash at bank, reserve account with NBE, deposits with foreign banks and treasury bills. NBE ranks banks whose liquidity ratio is greater than 20% as ‘Strong’, between 16% and 20% as ‘Satisfactory’, 15% ‘Fair’, between 9%-14% ‘Marginal’, and less than 9% as ‘Unsatisfactory’.

\(^8\) According to the definition of NBE, deposits include demand deposits, saving deposits, fixed deposits, trust funds and foreign bank their A/C.
Diversification (Dfn)

Following the footprints of previous studies, non-interest income to total income is used as a proxy for diversification in the present study. This ratio is computed as the percentage of the bank’s income other than interest income to its total income. This ratio is included because it reflects how well the bank has diversified its source of income. A high ratio of this would mean that the bank is performing better in terms of diversifying its activities to boost its income and thereby affect the profitability of the bank favorably. Thus, the variable is expected to have a positive relationship with bank profitability.

Bank Size (Bsz)

The other important determinant of bank performance that is considered by the study is bank size. Since it is difficult to exactly measure the size of a bank, the logarithm of the total assets of a bank is usually used as a proxy for bank size. Bank size is included as an explanatory variable to give an explanation for size-related economies of scale or diseconomies of scale in Ethiopia’s banking sector. Larger banks could reap more profits due to scale economies or scope economies. However, there is no consensus as far as the relationship between bank size and bank profitability is concerned. Thus, the sign of bank size on profitability is subject to empirical study.

Credit Risk (Lrs)

In the banking literature loan loss reserve to total loans is often used as a proxy for credit risk. The ratio of loan loss reserve to total asset is an important indicator of a bank’s asset quality as it specifically shows the amount of the total loan portfolio that has been reserved for but not canceled. Since a higher ratio of loan loss reserve to total asset could indicate a poor quality of loans or poor loan portfolio management and thus, a higher risk of a bank’s loan portfolio and since bad loans are expected to curtail the profitability of a bank, the loan loss to total loans ratio is expected to negatively affect bank profitability.

Real Gdp Growth Rate (Gdpr)

GDP is one of the primary macroeconomic indicators used to measure the health of the economy of a country, and it is a measure of the overall economic output within a country’s borders over a particular time, usually a year. Since economic growth and financial sector performance are positively correlated (Levine, 2000), the real GDP growth, used in this study, is expected to have a positive impact on bank’s profitability.

Inflation Rate (Infr)

According to Perry (1992), the relationship between inflation and bank profitability depends on the nature of inflation (whether the inflation is anticipated or unanticipated). If the inflation is anticipated type, the revenues of banks will increase faster than costs of banks because banks will be able to timely adjust interest rates. Thus, this type of inflation will have a positive impact on the profitability of banks.

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9 Service charge and commission income and other incomes
On the other hand, if the type of inflation is unanticipated one, bank costs will increase at faster rates than bank revenues because banks may not be fast in timely adjusting their interest rates. In such a case, inflation will have a negative impact on bank profitability. Thus, the expected sign of inflation on bank profitability is subject to empirical investigation.

**Market Concentration (Mcn)**

Concentration is calculated as the total assets held by the three largest commercial banks in the country divided by the total assets of all commercial banks in the country. Concentration is the proportion of an industry’s total assets controlled by its largest firms. According to the structure-conduct-performance (SCP) hypothesis, banks in highly concentrated markets tend to collude and therefore earn monopoly profits. Collusion may result in higher rates being charged on loans, less interest rates being paid on deposits and so on. Thus, according to the SCP hypothesis, a positive sign of this variable could indicate a high degree of concentration because banks in highly concentrated markets tend to collude and thus, earn monopoly profits. Nevertheless, not all studies have found evidence to support the SCP hypothesis. The expected sign of concentration is subject to empirical investigation.

**Model Specification**

Following the footprints of previous studies, the following model has been developed to empirically investigate the key factors that influence the profitability of commercial banks in Ethiopia:

\[
\pi_{it} = \gamma_0 + \gamma_1 Ctri_{it} + \gamma_2 Eqass_{it} + \gamma_3 Bsz_{it} + \gamma_4 Nlty_{it} + \gamma_5 Dfn_{it} + \gamma_6 Lirs_{it} + \gamma_7 Mcn_{it} + \\
\gamma_8 GDP_{it} + \gamma_9 Inf_{it} + \epsilon_{it}
\]

\[
\rightarrow \sigma_{it} = \delta_t + \mu_{it}
\]

Where \(i\) denotes a specific bank; \(t\) represents the examined time period; \(\pi_{it}\) stands for return on average assets (ROAA) of bank \(i\) at time \(t\); \(Ctri_{it}\) is cost to income ratio of bank \(i\) at time \(t\); \(Eqass_{it}\) is equity to average assets of bank \(i\) at time \(t\); \(Bsz_{it}\) is size (log of total assets) of bank \(i\) at time \(t\); \(Nlty_{it}\) is net loan to total assets of bank \(i\) at time \(t\); \(Lirs_{it}\) is liquidity of bank \(i\) at time \(t\); \(Dfn_{it}\) is diversification of bank \(i\) at time \(t\); \(Lirs_{it}\) is loan loss reserve to total loan of bank \(i\) at time \(t\); \(Mcn_{it}\) is market concentration at time \(t\); \(GDP_{it}\) is GDP growth rate at time \(t\); \(Inf_{it}\) is annual inflation rate at time \(t\); \(\epsilon_{it}\) is the disturbance term; \(\delta_t\) is the unobserved bank specific effect where \(\delta_t \sim \text{IID}(0, \sigma_{\delta}^2)\); \(\mu_{it}\) is the idiosyncratic error and is independently identically distributed with \(\mu_{it} \sim \text{i.i.d.}(0, \sigma_{\mu}^2)\). The above model is estimated using the fixed effects regression model. The fixed effects model is preferred to the random effect model following the result of the Hausman test indicated in Table 1 below. As it is indicated in the table 1, the Hausman test rejects the null hypothesis: difference in coefficients not systematic, at Ch-square=67.09 and P-value 0.0000, indicating preference to the fixed effect model.
Table 1 Hausman Test

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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(b)</td>
<td>(B)</td>
<td>(b-B)</td>
<td>sqrt(diag(V_b-V_B))</td>
<td>S.E.</td>
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<td>3.024471</td>
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<tr>
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<td>.5819871</td>
<td>.4075902</td>
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<td>3.23756</td>
<td>-2.1869</td>
<td>.3495037</td>
<td></td>
</tr>
<tr>
<td>cin</td>
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<td>-2.398543</td>
<td>-.090838</td>
<td>.204326</td>
<td></td>
</tr>
<tr>
<td>lqty</td>
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<td>-.0300666</td>
<td>-.0112938</td>
<td>.014742</td>
<td></td>
</tr>
<tr>
<td>llrs</td>
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<td>-3.214524</td>
<td>-.0361838</td>
<td>3.026552</td>
<td></td>
</tr>
<tr>
<td>mcl</td>
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<td>-.0013045</td>
<td>.0406468</td>
<td>.0361071</td>
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<tr>
<td>gdpl</td>
<td>.0301941</td>
<td>.0336973</td>
<td>-.0035032</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>infr</td>
<td>.0042888</td>
<td>.0062568</td>
<td>-.0019679</td>
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<td></td>
</tr>
</tbody>
</table>

Test:  

\[
\text{Prob}>chi2 = 0.0000
\]

RESULTS AND DISCUSSIONS

Descriptive Statistics and Pair-Wise Correlation Analysis

The descriptive statistics and the pair-wise correlation coefficients of the variables considered in this study are indicated in Table 2 and Table 3, respectively. The data in Table 2 are averaged across years and reported showing the trend of the key variables over the period 1999/2000-2008/9. Table 3 provides information on the degree of correlation between the explanatory variables used in the multivariate regression analysis. The recommendation of Kennedy (2008) is taken into account in judging whether or not multicollinearity problem seriously persists in the present study. To recap Kennedy, multicollinearity will be a series problem when the correlation is above 0.80. The pair-wise correlation indicated in Table 3 shows that in general the correlation between the explanatory variables is not strong. Thus, multicollinearity problems neither are severe nor existent in the present study.
Table 2 Descriptive statistics averaged* over 1999/2000-2008/2009**

<table>
<thead>
<tr>
<th>Variable</th>
<th>99/00</th>
<th>00/01</th>
<th>2-Jan</th>
<th>3-Feb</th>
<th>4-Mar</th>
<th>5-Apr</th>
<th>6-May</th>
<th>7-Jun</th>
<th>8-Jul</th>
<th>9-Aug</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROAA</td>
<td>1.55</td>
<td>1.86</td>
<td>0.96</td>
<td>1.57</td>
<td>2.22</td>
<td>2.4</td>
<td>2.88</td>
<td>2.7</td>
<td>3.14</td>
<td>2.26</td>
</tr>
<tr>
<td>Bsz</td>
<td>2994.4</td>
<td>3311.6</td>
<td>3542.3</td>
<td>4013.8</td>
<td>4765.6</td>
<td>5250.4</td>
<td>6009.9</td>
<td>6757.2</td>
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<td>8414.2</td>
</tr>
<tr>
<td>Nlta</td>
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<td>55.27</td>
<td>49.03</td>
<td>49.65</td>
<td>58.69</td>
<td>42</td>
<td>53.5</td>
<td>50.11</td>
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<tr>
<td>Cin</td>
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<td>75.47</td>
<td>66.24</td>
<td>58.69</td>
<td>90.88</td>
<td>57.98</td>
<td>66.78</td>
<td>56.17</td>
<td>36.87</td>
</tr>
<tr>
<td>Lqty</td>
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<td>39.9</td>
<td>46.78</td>
<td>48.28</td>
<td>50.44</td>
<td>133.72</td>
<td>49.14</td>
<td>57.29</td>
<td>58.24</td>
<td>64.27</td>
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<tr>
<td>Dfn</td>
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<td>29.47</td>
<td>29.48</td>
<td>37.37</td>
<td>39.61</td>
<td>38.93</td>
<td>35.76</td>
<td>35.6</td>
<td>35.62</td>
<td>42.84</td>
</tr>
<tr>
<td>Lrs</td>
<td>2.56</td>
<td>3.07</td>
<td>3.75</td>
<td>4.53</td>
<td>4.48</td>
<td>3.2</td>
<td>3.06</td>
<td>2.89</td>
<td>2.76</td>
<td>2.04</td>
</tr>
<tr>
<td>Mcn</td>
<td>85.3</td>
<td>83</td>
<td>79.83</td>
<td>76.55</td>
<td>74.11</td>
<td>70.05</td>
<td>66.96</td>
<td>64.15</td>
<td>61.33</td>
<td>57.75</td>
</tr>
<tr>
<td>GDPr</td>
<td>4.2</td>
<td>7.3</td>
<td>5.5</td>
<td>-2.1</td>
<td>11.7</td>
<td>12.6</td>
<td>11.5</td>
<td>11.8</td>
<td>11.2</td>
<td>10</td>
</tr>
<tr>
<td>Infr</td>
<td>4.2</td>
<td>-0.3</td>
<td>-10.6</td>
<td>15.1</td>
<td>7.3</td>
<td>6.1</td>
<td>10.6</td>
<td>15.8</td>
<td>25.3</td>
<td>36.4</td>
</tr>
</tbody>
</table>

Source: NBE, MoFED, and authors’ own calculation

* Averages are given in % except for Bsz

** Fiscal year ends June30

*** implies significant at 1%, and ** significant at 5%, Eqas is the ratio of equity to total assets, Bsz is the size of a bank measured as log of total asset of a bank, Nlta is the ratio of net loans to total assets, Cin is cost to income ratio, Dfn is diversification measured by the ratio of non-interest income to total income, Mcn market concentration measured by the square of the ratio of a bank’s total deposit to the total deposits of the commercial banks, Lrs is the ratio of loan loss provision to total loans, GDPr is the real annual GDP growth rate, and Infr is annual inflation rate.
The result of the fixed effects regression model taking ROAA as a dependent variable is reported in Table 4. As it is shown in Table 4, the R-squared ($R^2$-within), which is a measure of the goodness-of-fit of the regression model, is 70.5 percent. This implies that 70.5 percent of the variation within a given bank’s profitability is explained by the explanatory variables that are considered in the study. The remaining variation, which is about 29.5 percent, is explained by variables that are not captured by the model.

Capital adequacy and diversification are the two key determinants of bank profitability in Ethiopia as witnessed by the relatively higher significant coefficients of the equity to total assets (Eqas) and the non-interest income to total income (Dfn) ratios reveal. The equity to total asset ratio, which is used as a proxy for capital strength, is statistically and positively associated with bank profitability (ROAA). A positive and significant correlation between equity to total asset and profitability indicates that commercial banks in Ethiopia over the period 2000-2009 were focusing on making sound lending decisions which reaffirms that banks with more capital tended to engage in higher loan risk lending for higher profits. On the other hand, the study implies that banks that are relatively poorly capitalized were so conservative in extending loans and thus their profitability inauspiciously affected. The empirical finding is consistent with those found by Berger (1995), Demirguc-Kunt and Huizinga (1999), Staikouras and Wood (2003), Goddard et al. (2004), Pasiouras and Kosmidou (2007), and Kosmidou (2008). These studies indicate that well-capitalized banks face lower risks of going bankrupt, building their credit worthiness, thus reducing their cost of funding which will ultimately enhance their profit margin. From this perspective, strengthening the capital structure of Ethiopian commercial banks is crucial since it provides the banks an additional buffer to endure financial crises and offers better safety for depositors during unstable macroeconomic conditions. The ratio of non-interest income to total income, which measures the level of diversification of a bank’s activities, is found to have statistically significant and
positive impact on bank profitability. A positive and significant association between this variable and profitability reveals that commercial banks in Ethiopia that earned a higher proportion of their income from sources other than interest tend to report higher level of profits over the study period. The result of the study suggests that commercial banks in Ethiopia need to diversify their line of business activities to sustainably linger live in today’s tumultuous business environment.

Bank size (Bsz), log of total assets, is found to have statistically significant and positive impact on the profitability of commercial banks in Ethiopia. The positive coefficient indicates that larger commercial banks tend to earn higher profits than smaller commercial banks, and vice versa. The finding of the study provides support to the earlier studies finding economies of scale and scope for larger banks (Sufian, F., and Habibullah, 2009; Kosmidou, 2008, and; Kosmidou et al, 2006). Hauner (2005) gives two potential explanations vis-à-vis the positive association between bank size and bank performance. First, if this link relates to market power, large banks should pay less for their inputs. Second, there may be increasing returns to scale through the prioritization of fixed costs over a higher volume of services or through efficiency gains from a specialized workforce. Thus, the positive association between bank size and profitability of commercial banks in Ethiopia confers two important implications. One, larger commercial banks in Ethiopia could be benefited from scale or scope economies. Two, larger commercial banks could exert market power through strong brand image which ultimately enable them to reap more profits.

Expense management or operational efficiency of the banks, measured by the ratio of cost to income (Cin), is statistically significant and is negatively correlated with profitability. The result of the study implies that more operationally efficient commercial banks reported higher profits than those commercial banks that have poor expense management over the study period. Thus, the empirical result of the study reveals that a reduction in costs increases the profits of the commercial banks. This denotes that commercial banks in Ethiopia have much to profit if they are able to exercise efficient cost management practices. Generally, the study indicates that poor operational efficiency, i.e. management’s failure to control costs, is one of the factors that negatively affect the profitability of commercial banks in Ethiopia. The result of the study is consistent with Pasiouras and Kosmidou (2007), and Kosmidou (2008), among others. These studies reinforce the maxim that poor operational efficiency is one the key contributors to weak profitability.

The liquidity ratio (Lqty) is found to be statistically significant and negatively correlated with profitability. The negative correlation between liquidity and bank profitability ‘at face value’ reveals that the more liquid a bank is the less profitable it will be. Here one has to interpret the result with caution. Of course, a bank should be liquid enough to meet its depositors’ demand of withdrawing money at any time they want to withdraw. The lower ratio of this reveals that the bank will face difficulty in meeting payments in the right time and hence its liquidity low. A lower ratio of this would mean that the bank will not effortlessly get funds or else at an extremely high rate of interest which will mount the cost of funding and eventually impinge on the profitability of the bank unfavorably. On the other hand, if the bank is excessively liquid, it means that the bank is in ‘liquidity trap’ and is keeping its productive assets
idle. This ultimately jeopardizes the bank’s profitability because an extremely higher ratio of this would mean that the bank has kept excess liquid assets inactive and hence losing interest income. The empirical result of the study suggests that Ethiopian commercial banks kept excess liquidity which negatively affected their profitability. Thus, Ethiopian commercial banks have much to gain if they are able to improve their liquidity management practices.

The sign of loan loss reserve to total loans (Llrs), which measures bank’s credit risk, is as expected (negative). Though the loan loss reserve to total loans is statistically insignificant, its sign provides important implication for bank managers. Stern banking problems basically emanates from the failure of financial institutions to recognize impaired assets and create reserves for writing off these assets. Thus, the negative sign of loan loss reserve to total loans implies that Ethiopian commercial banks should exert efforts on implementing credit risk management, which the national bank of Ethiopia is seriously working on to assist the banks to evaluate credit risk more effectively and to avoid problems associated with loan defaults.

As far as the external factors are concerned, the study indicates that these factors have no statistically significant impact on the profitability of commercial banks in Ethiopia. However, the sign of these factors have important policy implications. Though concentration (Mcn) is found to be insignificant, a positive sign of this variable could indicate a high degree of concentration because banks in highly concentrated markets tend to collude and thus, earn monopoly profits. This supports the Structure-Conduct Performance hypothesis. According to the Structure-Conduct Performance hypothesis collusion may result in higher rates being charged on loans and less interest rates being paid on deposits. Thus, the positive sign of concentration may characterize the nature of Ethiopian banking sector as oligopoly type. This may indicate a need for more competition and more entry into the banking market. Inflation (Infr) is also found to be statistically insignificant but it is positively related to bank profitability. The positive sign of this variable indicates that inflation was anticipated by bank managers over the study period, enabling bank managers to timely adjust interest rates to curtail the cost of inflation. The other external factor that is considered is the real GDP growth rate (GDPr). Though its sign is as expected (positive), the variable is found to be statistically insignificant. The positive sign of this variable supports the argument that economic growth positively affects bank profitability.

Table 4 Regression result (ROAA as dependent variable)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Coefficient</th>
<th>Std.Err.</th>
<th>t-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eqas</td>
<td>11.7715</td>
<td>2.479065</td>
<td>4.75</td>
<td>0.000***</td>
</tr>
<tr>
<td>Bsz</td>
<td>0.9315065</td>
<td>0.43504</td>
<td>2.14</td>
<td>0.036**</td>
</tr>
<tr>
<td>NltA</td>
<td>1.047855</td>
<td>1.318679</td>
<td>0.79</td>
<td>0.43</td>
</tr>
<tr>
<td>Cin</td>
<td>-2.489376</td>
<td>0.4240112</td>
<td>-5.87</td>
<td>0.000***</td>
</tr>
<tr>
<td>Lqty</td>
<td>-0.0413605</td>
<td>0.0157169</td>
<td>-2.63</td>
<td>0.011***</td>
</tr>
<tr>
<td>Dfn</td>
<td>3.178341</td>
<td>1.525744</td>
<td>2.08</td>
<td>0.041***</td>
</tr>
<tr>
<td>Llrs</td>
<td>-5.371896</td>
<td>6.884118</td>
<td>-0.78</td>
<td>0.438</td>
</tr>
</tbody>
</table>
### CONCLUSIONS

The study was carried out to explore the key factors that influence the profitability of Ethiopian commercial banks using unbalance panel data of banks over the period 1999/2000-2008/2009. Using the fixed effects model, 7 internal and 3 external factors were regressed against ROAA of the banks. The study found that the internal factors are the most determinant factors of bank profitability in Ethiopia. Capital adequacy (equity to asset ratio), diversification (non-interest income to total income) and bank size (log of total assets) are among the internal factors that have positive and significant impact on the profitability of Ethiopian commercial banks. The loan loss reserve to total loans is also found to have negative impact on profitability though it is statistically insignificant. Liquidity and operational efficiency are among the internal factors that negatively affect the profitability of the banks. Thus, the study suggests that the managers of Ethiopian commercial banks should frame policies aimed at enhancing the profitability of the banks through improving the banks’ capital structure (strengthening the bank’s capital base), implementing risk management practices, devising mechanisms to better control bank operational costs, diversifying banks’ sources of income and utilizing bank assets more productively than keeping them idle (lowering the liquidity position).

Though the external factors are statistically insignificant, their signs provide relevant policy implications, and thus, should not be undermined. The positive sign between concentration and profitability evidences the prevalence of collusion among the banks, making some banks to earn monopoly profits by charging higher rates on loans and paying lower rates on deposits. This may imply that the banking sector in Ethiopia is not competitive enough. Thus, policy makers, and bank regulators should focus on formulating policies aimed at making the banking sector more competitive. The signs of inflation and GDP, though they are insignificant, as well provide important implications for policy makers and bank regulators. Both these variables have positive impact on bank profitability over the study period. Inflation was an anticipated type and thus bank managers were able to increase bank revenues at a faster rate than bank costs by timely adjusting interest rates.

### REFERENCES


