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Determinants of Non-Performing Loans : Evidence from Selected Commercial Banks in Ethiopia

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Abstract
The main purpose of this study was to examine Determinant of nonperforming loans on selected government and private commercial banks in Ethiopia using a balanced panel data of twelve commercial banks selected purposively from year (2011G.C-2020G.C).The study used explanatory research following a quantitative approach and secondary data of audited annual financial report of respective banks from National Bank of Ethiopia, The data's were analyzed by using multiple linear regression model using STATA 16.1 software package for this empirical study. The finding of the research revealed that Loan to deposit ratio (LTD) ratio had positive effect as Inflation had a negative, but insignificant effect on NPLs of commercial banks in Ethiopia. However, bank profitability measured in terms of Return on equity (ROE), banks capital adequacy ratio and lending rate had negative and statistically significant effect whereas bank profitability measured in terms of Return on Asset (ROA) and effective tax rate had positive and statistically significant effect on non-performing loans of commercial banks in Ethiopia. Furthermore, the study recommended as bank managers should emphasize the management of current assets and loans than fixed assets in order to reduce the level of nonperforming loans. Besides, it is better for the loan officers to provide financial counseling to the borrowers on the wise use of loan and also to make decision on timely fashion to meet their need.
Keywords: Nonperforming loans, bank specific factors, macroeconomic factors
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INTRODUCTION

Banks play an important role in contributing to the country's economic development and also the functioning of an economy (Pasiouras and Kosmidou, 2007). If the banking industry is not working well, the effect on the economy can be large and broad. Efficiency of commercial banks in managing their risk in different business cycles can lead to improved losses and crises between them (Alexandri and Santo so, 2015). Typically, Ameur and Mhiri (2013) defined risk as an exposure to a proposal for which one is uncertain. The banking business, compared to other types of business, is substantially exposed to risks, especially in this ever-changing competitive environment. Banks no longer simply receive deposits and make loans. Instead, they are operating in a rapidly innovative industry with a lot of profit pressure that urges them to create more and more value-added services to offer to and better satisfy the customers. Risks are much more complex now since one single activity can involve several risks (Dam, 2010).

According to Nazanin and Kateryna (2015), one of the main causes of major failures at banks until now was the lack of attention to risk management in general and to operational risk management in particular. The relevance of this issue has grown in addition to operational risk management challenges concerning risk culture, internal control and risk governance (Schwarts and Garliste, 2013).

In addition to credit, liquidity and market, operational risk is the other significant risk in banks. These risks are all interconnected to each other, but for the purpose of this research the focus is only on operational risks and how they should be managed. Although the recent financial crisis has been generally characterized as a liquidity crisis, operational risk and its factors have played a significant role in crisis length and severity (Jongh and Vuuren, 2013). Therefore, the need to explore the concept of operational risk has increased significantly. In the last few decades there is a lot of banking fall down in all over the world (Brown bridge and Harvey, 1998), and due to these banking failures several banks have been closed by regulatory authorities (Brown bridge, 1998). These banking failures unenthusiastically affect the economy in many ways, firstly these banking failures causes banking crisis by destructing the banking sector, it also diminish the credit flow in the country, which ultimately affect the efficiency and effectiveness of the business units (chijoriga, 1997; Brown bridge and Harvey, 1998).Accordingly to Brown bridge, (1998) many empirical researches have shown that most of the time banking failures or baking crisis are caused by non-performing loans.

Non-performing loans (NPLs) generally refer to loans which for a relatively long period of time do not generate income. This implies that the principal and or interest on these loans have been left unpaid for at least 90 days (Caprio and Klin-gebiel, 1999). It has become a critical issue of discourse in finance literature because of the close link between banking crises and massive accumulation of NPLs. Nonperforming loans are one of the main reasons that cause insolvency of financial institution and ultimately hurt the whole economy (Hou, 2007). By considering these facts, it is necessary to control nonperforming loans for the economic growth in the country

otherwise the resource can be jammed in unprofitable projects and sectors which not only damages the financial stability but also the economic growth. In order to control the non-performing loan, it is necessary to understand the phenomena and the nature of nonperforming loans; it has many implications as fewer loan losses is indicator of comparatively more secured firms of financial system on the other hand high level of nonperforming loans is indicator of unsecure financial system (Hou, 2007).

Huge NPLs may negatively affect the level of private investment, increase deposit liabilities and constrain the scope of bank credit to the private sector. In the same way, accumulation of NPLs can negatively affect private consumption which may lead to economic contraction. Also, huge NPLs may exacerbate the already high pressure on government revenues as attempt to resolve it may force government to provide financial assistance to problem banks (Conzalez-Hermosillo et al, 1997).

Essentially, if the issue of non-performing loans is left unresolved, it can compound into financial crisis, where the loans exceed bank capital in a relatively large number of banks. Given the economic, fiscal and financial costs of non-performing loans, it is therefore imperative to control it. However, in order to control non-performing loans, it is necessary to understand its roots causes. According to different study that undertaken, the cause of such low repayment and high NPL ratio performance would emanate from institution specific factor and borrower specific factor, thus this study tried to examine the determinant factor of Nonperforming loans in case of Commercial banks of Ethiopian. Under the Ethiopian banking business directive, nonperforming loans are defined as "loan or advance whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advance is question" National Bank of Ethiopia (NBE, 2008).

Statement of the Problem

Banks today are the largest financial institutions around the world, with branches and subsidiaries throughout everyone's life (Runkle, 1993). Commercial banks are exposed to different risks. In the process of providing financial services, they assume various kinds of financial risks (Santomero, 1997). On the other hand, Lending represents the heart of the banking industry and one of the core processes in the Loan are the dominate asset of most banks and represent 50-75 percent of the total amount at most share of operating income and represent the banks greater risk exposure (MacDonald and Koch, 2006). NPLs affect the bank`s liquidity and profitability which are the main components for the overall efficiency of the bank. An increase in NPLs provision diminishes income. Again, mismatch of maturities between asset and liability create liquidity risk for the banks that deteriorate bank`s overall credit rating including its image (Badar and Yasmin, 2013). Therefore, the determinants of NPLs should be given a due consideration because of its adverse effect on survival of banks.

The adverse effect of NPLs is attributable to bank managers' adverse selection of its borrowers (Brownbridge, 1998). NPLs are determined by different factors such as level of GDP, inflation, unemployment, volume of deposit, return on equity, return on asset, capital adequacy, total loan, liquidity, bank size, excessive lending, interest rate and credit growth. These factors are studied by different researchers in different countries (Mileris, 2012; Tomak, 2013; Ahmad and Bashir (2013), Shingjerji, 2013). Though, there are a number of studies that are conducted at a global level to examine the determinants of NPLs, most of the studies were made with reference to developed countries like Italy, Spain, Greece, Europe and USA and the like. This means, they do not explain the issues for emerging market particularly for Ethiopian case. For instance; The study of Saba *et al.* (2012) on the title of "Determinants of Nonperforming Loan on US Banking sector" found negative significant effect of lending rate and positive significant effect of real GDP per capital and inflation rate on NPL via OLS regression model. Compared to other countries, the banking industry in Ethiopian has its own unique features that distinguish them from other countries financial market. One of the feature is the regulation of the country is not allowed foreign nations or organization to fully or partially acquire share of Ethiopian banks. Besides, there is no secondary market. Moreover, in the country, a rapidly growing industry is the banking sector. As a result, it is visible to conduct a study on the determinants of NPLs of commercial banks in Ethiopia which is crucial. In light of the above facts and research gaps, this study tried to provide real information about the determinant factors affecting NPLs of commercial banks in Ethiopia.

General objectives

- To examine the bank specific determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia
- To examine macroeconomic determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia
- To examine the trends of nonperforming loans (NPLs) of commercial banks in Ethiopia

Research Hypotheses

Based on various pervious literature review the following hypotheses were developed and tested.

H1. Loan to deposit ratio (LTD) has positive relation with Nonperforming loans in Ethiopian commercial banks.
H2. Return on asset (ROA) has negative relation with Nonperforming loans (NPLs) in Ethiopian commercial banks.
H3. Return on equity (ROE) has negative relation with Nonperforming loans of commercial banks in Ethiopia.
H4. Capital adequacy ratio (CAR) has negative relation with Nonperforming loans (NPLs) in Ethiopian commercial banks.
H5. Inflation rate (INF) has negative relation with Nonperforming loans (NPLs) in Ethiopian commercial banks.
H6. Lending rate (LR) has positive relation with Nonperforming loans (NPLs) in Ethiopian commercial banks.
H7. Effective tax rate (ETR) has positive relation with Nonperforming loans (NPLs) in Ethiopian commercial banks.

LITERATURE REVIEW

Nonperforming Loans (NPLs)

There is no common definition of nonperforming loans (NPLs) in the whole country since it is recognized that it is possible that what is appropriate in one country may not be so in another. There is, however, some common opinion on this issue. Accordingly, the IMF's Compilation Guide on Financial Soundness Indicators, NPLs is defined as: *"A loan is nonperforming when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons such as a debtor filing for bankruptcy to doubt that payments will be made in full"*(IMF, 2005).
Besides, the Ethiopian banking regulation also defines NPL as follows:
"*Nonperforming loan and advances are a loan whose credit quality has deteriorated and the full collection of principal and/or interest as per the contractual repayment terms of the loan and advances are in question" (NBE, 2008).*
Generally, NPLs are loans that are outstanding both in its principal and interest for a long period of time contrary to the terms and conditions under the loan contract. Any loan facility that is not up to date in terms of payment of principal and interest contrary to the terms of the loan agreement is NPLs. Thus, the amount of nonperforming loan measures the quality of bank assets (Tseganesh, 2012).

Empirical Literature

This chapter provides so many evidences which identify the major determinants of bank loans, particularly, nonperforming loans. In case, some studies are conducted on particular country and the others on panel of countries. Hence many researchers have conducted a lot of study on determinants nonperforming loans (NPLs), due to its significance for the bank's failure. In case, the researcher starts reviewing empirical related literatures from the study made across country and then single country studies.

There are a plenty of variables that affect the NPLs of banking sectors. In this study, the researcher focused on both bank specific and macroeconomic determinants of NPLs of commercial bank in Ethiopia. Internal factors are caused by internal functions and activities of bank, and are due to decisions and practices of officials and staff's functions. These factors are controllable in which the manager can prevents them through using suitable method, determination and elimination of weakness and improvement of process. Whereas, external factors can`t be controlled by bank managers and are caused by external environment including effect on implementation of decisions and also government policies. For instance; unexpected events, changing in rules and obligations, political and economic changes (inflation and slump) are external factors (Biabani *et al.*, 2012). However, a variety of variables that got more attention and included in this thesis are loan to deposit ratio, capital adequacy/solvency ratio, profitability (ROA & ROE), lending rate and effective tax rate.

Boudriga *et al.* (2009) conducted a study on the title "bank specific determinants and the role of the business and the institutional environment on Problem loans in the MENA countries" for 2002-2006 periods. They employed random-effects panel regression model for 46 countries. The variables included were credit growth rate, Capital adequacy ratio, real GDP growth rate, ROA, the loan loss reserve to total loan ratio, diversification, private monitoring and independence of supervision authority on nonperforming loans. The finding revealed that credit growth rate is negatively related to problem loans. Capital adequacy ratio is positively significant justifying that highly capitalized banks are not under regulatory pressures to reduce their credit risk and take more risks. Also ROA has negative and statistically significant effect on NPLs. This result supports as greater performance measured in terms of ROA reduces nonperforming loans since reduced risk taking in banks exhibiting high levels of performance.

Skarica (2013) also conducted a study on the determinants of NPLs in Central and Eastern European countries. In the study, Fixed Effect Model and seven Central and Eastern European countries for 2007-2012 periods was used. The study utilized loan growth, real GDP growth rate, market interest rate, Unemployment and inflation rate as determinants of NPLs. The finding reveals as GDP growth rate and unemployment rate has statistically

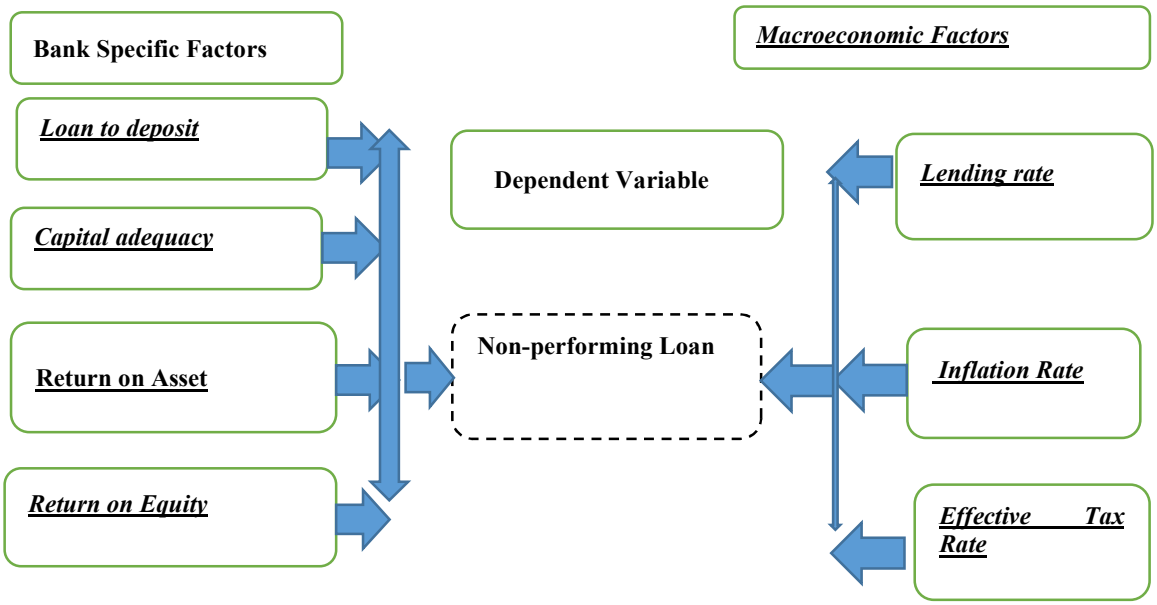
significant negative association with NPLs with justification of rising recession and falling during expansions and growth has an impact on the levels of NPLs. This shows as economic developments have a strong impact on the financial stability. The finding also reveals as inflation has positive impact with justification as inflation might affect borrowers' debt servicing capacities.

Makri *et al.* (2014) identify the factors affecting NPLs of Euro zone's banking systems for 2000- 2008 periods before the beginning of the recession exclusively pre-crisis period. The study includes 14 countries as a sample out of 17 total Euro zone countries. The variables included were growth rate of GDP, budget deficit (FISCAL), public debt, unemployment, loans to deposits ratio, return on assets, and return on equity and capital adequacy ratio. The study utilized difference Generalized Method of the Moments (GMM) estimation and found as real GDP growth rate, ROA and ROE had negative whereas lending, unemployment and inflation rate had positive significant effect on NPLs. However, ROA & loan to deposit ratio, inflation, and budget deficit did not show any significant impact on NPL ratio. Similarly, Carlos (2012) on macroeconomic determinants of the Non-Performing Loans in Spain and Italy found as inflation rate has insignificant effect on NPLs.

Selma and Jouini (2013) conducted a study on three countries namely Italy, Greece and Spain for the period of 2004-2008 to identify the determinants of non-performing loans for a sample of 85 banks. The variables included both macroeconomic variables (GDP growth rate, unemployment rate and real interest rate) and bank specific variables (return on assets, loan growth and the loan loss reserves to total loans). They apply Fixed Effect model and found a significant negative relationship of ROA & GDP growth rate, and also positive relationships of unemployment rate, the loan loss reserves to total loans and the real interest rate with NPLs. For a significant positive association between NPLs and real interest rate, they justify that when a rise in real interest rates can immediately leads to an increase in non-performing loans especially for loans with floating rate since it decreases the ability of borrowers to meet their debt obligations. In addition, a significant negative relationship between ROA and the amount of NPLs justify that a bank with strong profitability has less incentive to generate income and less forced to engage in risky activities such as granting risky loans.

Conceptual Framework

The following conceptual model is framed to summarize the main focus and scope of this study in terms of variables included. The blue color part represents the dependent variables used in this study.



Source: from literatures.

RESEARCH METHODOLOGY

Research Design and Approach

Research design is a master plan specifying the methods and procedures for collecting and analyzing the required data. The choice of research design depends on objectives that the researchers want to achieve (John, 2007). Since this study was designed to examine the relationships between NPLs and its determinants, a logical reasoning either deductive or inductive is required. Deductive reasoning starts from laws or principles and generalizes to particular instance whereas inductive reasoning starts from observed data and develops a generalization from facts to theory.

Besides, deductive reasoning is applicable for quantitative research whereas inductive reasoning is for qualitative research. Thus, due to quantitative nature of data, the researcher used deductive reasoning to examine the cause and effect relationships between NPLs and its determinants in this study.

Nature of Data and Instruments of Data collection

This study used panel data. The researcher prefers to use panel data since panel data can take heterogeneity among different units into account over time by allowing for individual-specific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004).

Accordingly, the researcher used secondary sources of data that is panel in nature. A secondary source of data was preferred by the researcher since it is less expensive in terms of time and money while collecting. And also, it affords an opportunity to collect high quality data (Saunders et al (2007) cited in Belay (2012). Secondary data may either be published or unpublished data (Kothari, 2004). Accordingly, secondary data was obtained from the audited annual financial statements of the concerned commercial banks in Ethiopia. These data include both bank specific and macroeconomic factors. The bank specific which was obtained from the country's central bank, National bank of Ethiopia, which regulates the banking sector of the country and the head office of each selected commercial banks whereas one of macroeconomic variable was collected from the central statistical agency (CSA).

Sampling Design

Sample design deals with sample frame, sample size and sampling technique. Sampling is a technique of selecting a suitable sample for the purpose determining parameters of the whole population. Population is the list of elements from which the sample may be drawn (John, 2007). A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population.

As to December of 2021, there are 17 banks fully operated in Ethiopia. These are one government bank, commercial bank of Ethiopia(CBE), Awash international bank(AIB), bank of Abyssinia(BOA), Wegagen bank(WB), United bank(UB), Nib international bank(NIB), Dashen bank(DB), Cooperative bank of Oromia, Lion international bank, Zemen bank, Oromia international bank, Buna international bank, Berhan international bank, Abay bank S.C, Addis international bank S.C, Debub global banks' and Enat banks and newly established sinke bank, Amhara Bank, Zemzem Bank and Sheger Bank.

As noted by Kothari (2004), good sample design must be viable in the context of time and funds available for the research study. Besides, judgmental sampling offers the researcher to deliberately select items for the sample concerning the choice of items as supreme based on the selection criteria set by the researcher. Accordingly, this study employed purposive sampling technique to select the required sample of banks from the above listed banks since it is viable in line with time and funds available for this study. The selection criteria set by the researcher was first, the required banks are only Commercial banks in Ethiopia. Second, those commercial banks that were established before 11 years were selected and those banks having audited financial statements for consecutive ten years.

Therefore, the data for this study was collected from 12 commercial banks in the country. Out of which one state owned commercial banks, commercial bank of Ethiopia (CBE) whereas the remaining 11(eleven) banks: - Awash international bank (AIB), bank of Abyssinia (BOA), Wegagen bank (WB), United bank (UB), Nib International bank (NIB), Dashen bank (DB), Cooperative bank of Oromia, Buna international bank, Zemen Bank, Oromia International Bank and Lion bank were private banks that were registered before 2011/12 by NBE.

Data Analysis and Presentation

As noted by Kothari (2004), data has to be analyzed in line with the purpose of the research plan after data collection. Accordingly, secondary data collected from NBE, CSA and head office of each respective bank were analyzed to determine its suitability, reliability, adequacy and accuracy. Thus, this study utilized both descriptive and econometric analysis based on a panel data from 2011G.C-2020G.C to examine the relationship between the NPLs and its determinant factors in commercial banks found in Ethiopia. The data collected from different sources were coded, checked and entered to simple excel program to make the data ready for analysis. Then the collected data was processed and analyzed through STATA version 16.1 software packages.

For descriptive analysis; table and percentage were used to analyze the data. Besides, results of the descriptive statistics such as mean, standard deviation, minimum and maximum values were reported to describe the characteristics of variables under investigation. Furthermore, various diagnostic tests such as normality, heteroskedasticity, auto correlation and multicollinearity test were conducted to decide whether the model used in the study is appropriate and to fulfill the assumption of classical linear regression model. Thus, in order to examine the possible degree of Multicolinearity among variables, correlation matrixes and variance inflation factor were used. To this end, the researcher used fixed effect regression model analysis to examine the effect of each explanatory variable on nonperforming loans of commercial bank in Ethiopia. Thus, regression results were

presented in a tabular form with the appropriate test statistics and then an explanation of each parameter were given in line with the evidence in the literature.

Model Specification

The aim of this study is to examine the determinants of NPLs of commercial banks in Ethiopia. Similar to the most noticeable previous research works conducted on the nonperforming loans of financial sectors, this study used nonperforming loans ratio as dependent variables whereas Loan to deposit ratio, capital adequacy ratio, return on asset, return on equity, Average lending rate, inflation rate and effective tax rate as explanatory variables. These variables were chosen since they are widely existent for the commercial bank in Ethiopia. Accordingly, this study examined the determinants of NPLs of commercial banks in Ethiopia by adopting a model that is existed in most literature. The regression model which is existed in most literature has the following general form;

$$Yit = \beta o + \beta X_{it} + \varepsilon_{it}$$

Where: - Y_{it} is the dependent variable for firm 'i' in year 't', $\beta_0$is the constant term, β is the coefficient of the independent variables of the study, X_{it} is the independent variable for firm 'i' in year 't' and ε_{it} the normal error term. Thus, this study is based on the conceptual model adopted from Fawad and Taqadus (2013). Accordingly, the estimated models used in this study are modified and presented as follow;

$$\mathbf{NPL_{it}=\beta_0+\beta_1(LTD)_{it}+\beta 2(CAR)_{it}+\beta 3(ROA)_{it}+\beta_4(ROE)_t+\beta_5(ALR)_{it}+\beta_6(INFR)_{it}+\beta 7(ETR)_{it}+\varepsilon it}$$ Where;

- $\beta_0$is an intercept
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6,$ andβ_7 represent estimated coefficient for specific bank i at time t,
- LTD, CAR, ROA, ROE, ALR, INF and ETR represent Loan to deposit ratio, capital adequacy/Solvency ratio, return on asset, return on equity, Average lending rate, inflation rate and effective tax rate respectively
- ε_{it} represents error terms for intentionally/unintentionally omitted or added variables. It has zero mean, constant variance and non- auto correlated. The coefficients of explanatory variable were estimated by the use of ordinary least square (OLS) technique.

RESULT AND DISCUSSION

Descriptive statistics

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study was NPLs ratio while explanatory variables are LTD, ROE, ROA, CAR, ALR, INF and ETR. Accordingly, the following table 4.5 reports mean, maximum, minimum, standard deviation and number of observation for each variable used in this study. In case, the following table 4.4 shows that all variables have 120 observations. Thus, mean, standard deviation, minimum and maximum values of both dependent and explanatory variables for Commercial Banks in Ethiopia from 2011G.C-2020G.C were demonstrated as follows:

Table 4.5

Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
NPL	120	11.82821	12.25082	0.3	60.04
LTD	120	69.92695	19.9799	21.23	121.17
ROE	120	22.64032	14.3512	-57	70
ROA	120	2.519219	1.397962	-2.13	11.62
CAR	120	11.29685	4.008946	4	28.03
ALR	120	10.98385	1.502616	7	12.3
INF	120	14.16667	12.65086	-10.6	36.4
ETR	120	29.93375	11.49718	-7	125

Source: NBEs, Banks annual report computed through Stata 16.1 output, 2022

As can be seen from table 4.5, for the total sample of 120 observations, NPLs ratio measured by Nonperforming loans divided by total loan ranges from 0.3- 60.04 percent. It has a mean of 11.82% showing the lowest deviation (-0.43%) from its mean value. This indicates that Commercial banks in Ethiopia incurred 11.82%NPLs on averages from its total loan. According to Ethiopian context, the banking sectors are required to maintain the ratio of NPLs at least below 5% (NBE, 2008). However, as indicated above in table 4.5, the NPLs of commercial banks in Ethiopia are more than the required threshold. Thus, NPLs problem are still serious for commercial banks in Ethiopia.

Regarding LTD ratio that measured by total loans divided by total deposits, it ranges from a minimum of 21.23% to a maximum of 121.17%. It has a mean of 69.93% with highest deviation (49.95%) from its mean value. As far as profitability ratios concerned, ROA records a minimum of -2.13 and maximum of 11.62% with a mean

value of 2.52%. In case, even if high ROA indicates better performance in the management of available assets, commercial banks in Ethiopia shows low performance with regard to ROA during the study period as compared to ROE. On the other hand, ROE measured by the net profit divided by total equity of the bank measures how much the banks are efficiently earning from funds invested by its shareholders. As shown in the above table 4.5, ROE records a minimum of -57% and maximum of 70% with a mean of value of 22.64%. This implies that commercial banks in Ethiopia have relatively a good performance in terms of ROE as compared to ROA during the study period. Thus, commercial banks in Ethiopia earned high return from its own equity than assets.

To sum up, LTD ratio had the highest deviation (49.95%) whereas NPLs had the lowest deviation (-0.43 %.) from its mean Value. Besides, commercial banks in Ethiopia earned high return from its own equity than assets. Furthermore, average value of NPLs of commercial banks in Ethiopia are above the required threshold (<5%) showing a serious loss from loans whereas CAR are more than the minimum requirement (8%) showing better risk withholding ability of banks as per the National bank of Ethiopia.

Fixed effect regression result

This section presents the outputs of the regression analysis to determine the relationship between non-performing loans on bank specific and macro-economic independent factors that are used as a control variable.

Before running the regressions, the data sets were checked under certain assumption of classical linear regression model (CLRM). Such as, test of Normality, multicollinearity, heteroscedasticity, and autocorrelation and model specification test to satisfy the assumptions and to undertake reliable estimations. Overall, the tests were in line with the CLRM. The outputs of the regression were presented in the below.

Table 0:8 Results of fixed effect regression model

Explanatory Variables	**Coefficient**	**Std. Error**	**P>|t|**
Loan to Deposit Ratio	0.0061738	0.0593928	0.917***
Capital Adequacy Ratio	-0.559224	0.0697555	0.000*
Return on Asset	3.832226	0.7330695	0.000*
Return on Equity	-1.046489	0.3070609	0.001*
Average Lending Rate	-2.953288	0.6861642	0.000*
Inflation Rate	-0.065195	0.0717177	0.366***
Effective Tax Rate	0.1681874	0. 0715277	0.021**
Constant	54.49	9.94697	0.000*
R^2 0.6426 Rho .41139 Prob>F=0.0001			

Source: own computations Via Stata 16.1 from NBE and CSA

As shown in the above table 4.8, coefficient of determination was 64.26% revealing that 64.26% of variation in NPLs ratio is explained by the selected explanatory variables (loan to deposit ratio, profitability, capital adequacy ratio, average lending rate, inflation rate and effective tax rate). Besides, Rho displays that 41.14% variation in NPLs is due to entity specific characteristics of the selected cross sectional entities i.e. commercial bank in Ethiopia. Furthermore, Since F- statistics is designed to jointly test the impact of explanatory variables on dependent variables; F-statistics of this model has a p-value of 0.0001 indicating rejecting of the null hypothesis. This implies that all selected explanatory variables can affect the level of NPLs in common. Furthermore, the researcher examined the impact of both bank specific and macroeconomic factor on the level of NPLs based on regression result of fixed Effect Model in the above table 4.8 in terms of examination of coefficients of explanatory variables and significance level. Through the examination of coefficients for bank specific factors, ROE and CAR had negative impact on NPLs having a coefficient of -0.56 and -1.05 respectively. This indicates that one unit change in ROE and CAR can result a change on NPLs rate by 0.56 and 1.05units in opposite direction respectively. However, ROA had positive impact on NPLs having a coefficient of 3.83 which implies one unit change in ROA can result a change on NPLs rate by 3.83units in the same direction. LTD also had positive impact on NPLs. Besides, from macroeconomic factors, average lending rate had negative impact on the level of NPLs having a coefficient of-2.95 which indicates a one-unit change (increase/decrease) in average lending rate can result a change on NPLs by 2.95 units in opposite direction. Besides, INFR had negative impact on NPLs. Whereas effective tax rate had positive impact on the level of NPLs having a coefficient of 0.17 which indicates one unit change in tax rate can result a change on NPLs by0.17units.

In terms of significance level (corresponding p-value), all explanatory variables had p-values of less than the selected significance levels (5%) except for LTD and INF. As shown in the above table 4.8, ROA, CAR and ALR had strong and statistically significant (p-value = 0.000) impact on the level of NPLs even at 1%. Besides, ROE and ETR had statistically significant (p-value = 0.021and 0.001 respectively) impact on the level of NPLs at 5%. However, LTD and INF had no statistically significant impact on the level of NPLs with a p-value of 0.917 and 0.366 respectively. Thus, contrary to the researcher`s expectation, LTD ratio from bank specific factor and inflation

rate from macroeconomic factors did not show any significant impact on the level of NPLs of commercial banks in Ethiopia. Furthermore, the above table 4.8 shows rejection of null hypothesis for ROA and ALR.

Return on Equity (ROE)

The results of fixed effect model in the above table 4.8 indicate that there is a negative and statistically significant impact of ROE on the level of NPls. The result shows strong effect of bank profitability measured in terms of ROE on NPLs with a coefficient of -0.56 and a p-value of 0.000 at 1% and 5% significance level. This implies that for one unit change in ROE, keeping the other things constant had resulted 0.56 unit change on the level of NPLs in opposite direction. This result confirms the finding of Makri *et al*. (2014) and Boudriga *et al. (*2009) where aggregate country data was used, Klein (2013), Shingjerji (2013), Ahmad and Bashir (2013) and Hyun and Zhang (2012) where particular country data was used.

Contrary to the finding of Louzis *et al. (*2012) where particular country data was used, this result, as expected, indicates a negative significant effect of ROE on the levels of NPLs of commercial banks in Ethiopia. This implies that deterioration of profitability ratio in terms of ROE leads to higher NPLs. This negative significant impact of ROE on the levels of NPLs indicates the existence of better management of funds invested by shareholders via good agency relationships in commercial banks in Ethiopia.

Return on Asset (ROA)

The regression result of fixed effect model in the above table 4.8 is inconsistent with the hypothesis developed by the researcher. The study hypothesized that there is a negative association between ROA and NPLs of banks. Contrary to the hypothesis, the estimated coefficients and test statistics of ROA was 3.83 and 0.000 respectively. This reveals positive and statistically significant impact of ROA on the levels of NPLs and implies that for one unit change in bank profitability measured in terms of ROA, keeping the other thing constant had resulted 3.83unitchange on the level of NPLs in the same direction.

Unlike the study made by Boudriga *et al*. (2009) and Makri *et al.* (2014) where aggregate country data was used, and Selma and Jouini (2013) where particular country data was used, the results of this study confirms the finding of Swamy (2012) and, Ahmad and Bashir (2013) where single country data was considered. Thus, results of this study examined positive significant effect of bank profitability measured in terms of ROA on the levels of NPLs of commercial banks in Ethiopia.

The main reason for this positive impact of ROA on the levels of NPLs resulted from bank managements' inefficiency on asset utilization and also poor loan quality in the Ethiopia. Thus, the finding implies that commercial banks in Ethiopia are less incentive for return gained from assets and also to provide loans.

Capital Adequacy Ratio (CAR)

Regarding capital adequacy ratio that determines the risk taking behavior of banks, this study identifies statistically significant and negative impact of capital adequacy ratio on NPLs. Thus, regression result of fixed effect model in the above table 4.8is consistent with the hypothesis developed in this study. The study hypothesized that there is a negative association between CAR and NPLs of banks. This negative sign indicates an inverse relationship between capital adequacy ratio and NPLs. Thus, it implies that for one unit change in the banks' capital adequacy ratio, keeping other thing constant had resulted 0.56 unit changes on the levels of NPLs in opposite direction.

The result of this finding is consistent with the study of Hyun and Zhang (2012) where particular country data was used and Makri *et al.* (2014) where aggregate country data was used. Unlike the study made by Boudriga *et al. (*2009), and Djiogap and Ngomsi (2012) where aggregate country data was used and, Shingjerji (2013) and Swamy (2012) where particular country data was used, the result of this finding confirms significant negative effect of CAR on the levels of NPLs of commercial banks in Ethiopia by supporting the arguments that state well capitalized banks are better able to resist the levels of risk. This implies commercial banks in Ethiopia are less the incentives to take riskier loan activities due to highly regulated nature of the institution in the country. Thus, negative impact of CAR on NPLs is due to effective regulatory pressures by NBE on capital adequacy ratio of banks and also bank managements' efficient utilization of its capital to absorb NPLs.

Lending Rate

The regression result of fixed effect model in the above table 4.8 is inconsistent with the hypothesis developed in this study. The study hypothesized that there is a positive association between lending rate and NPLs of banks. Unlike the findings of Ranjan and Chandra (2003) and Farhan *et al.* (2012), Tomak (2012), Konfi (2012), and Daniel and Wandera (2013) where aggregate country data was used, the result of Fixed Effect Model in the above table 4.8 indicates statistically significant negative impact of lending rate on NPLs in Ethiopia. This negative sign indicates an inverse relationship between lending rate and NPLs. It implies that for one unit change in the banks' lending rate, keeping other thing constant had resulted 2.95 units change on the levels of NPLs in opposite direction.

The finding of this study confirms the finding of Joseph (2011), Saba *et al.* (2012), Ahmad and Bashir (2013),

Hyun and Zhang (2012) and Ali and Eva (2013) that argues negative effect of lending rate on the NPLs of banks. Thus, according to commercial banks in Ethiopia, change in lending rate had no direct impact on NPLs since change in lending rate has a limit by regulatory authorities.

The main reason for this negative association between lending rate and NPLs for Commercial bank in Ethiopia is: First, higher lending rate curtail ability to borrow, which decreases the amount of loan and then reduce NPLs. In case, higher lending rate enable individuals with funds to start saving with the banks to earn on their funds but investors with the profitable projects feel unwilling to borrow and invest. Second, increasing the level of lending rate has maximum and minimum limit by itself. That means degree of increase in lending rate and amount of NPLs may not be equal. Rather, ability to repay debt depends on other factors like borrowers' source of income. That is due to mismatch between the time they got return from their investment and the time they repay their debts. In case, when lending rate increases at the time they got return on their investment, the borrowers' ability to repay their debt increase resulting reduction in NPLs.

Effective Tax Rate (ETR)

The regression result of fixed effect model in the above table 4.8 is consistent with the hypothesis developed in this study. The study hypothesized that there is positive association between effective tax rate and NPLs of banks. Thus, consistent with the hypothesis, the estimated coefficients and test statistics of effective tax rate was 0.17 and 0.021 respectively showing statistically significant positive impact of effective tax rate on the level of NPLs commercial banks in Ethiopia. This implies that every one unit change in effective tax rate, keeping other thing constant had resulted 0.17 units change on the levels of NPLs in the same direction. The result of this study indicates that commercial banks in Ethiopia incur high NPLs at the time of high corporate income tax payment. The result of this study confirms the arguments of Albertazzi and Gambacorta (2006), Kaplow (2008) and Khan *et al*. (2011). Thus, this result implies as NPLs of commercial banks in Ethiopia gets higher during high income tax rate in the country.

This positive and statistically significant impact of effective tax rate on NPLs of commercial banks in Ethiopia result as bank shift its tax burden to borrowers via increasing fees and other commission, and also lending rate on loans, the borrowers pay this tax burden for the banks as compensation and also their own tax to the government as an obligation. Thus, borrowers who faced this double burden are unable to pay their debt.

Summary Of Major Finding And Recommendations

Summary of major Findings

The main objective of this study was to examine the determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia based on panel data analysis from 2011G.C to 2020G.C period. The study employed explanatory research design and quantitative data analysis techniques to obtain information on the study variables and to establish causal relationship between variables.

So as to meet this purpose, data related to the study were collected from National bank of Ethiopia on twelve sampled commercial banks from the period of 2011 to 2020G.c and this data was analyzed using descriptive statistics and multiple linear regression analysis. In order to conduct the empirical analysis, A dependent variable (Non performing loan), and seven independent variables from bank specific determinants, loan to deposit ratio, capital adequacy ratio, Return on Asset, return on equity and from macro-economic variables foreign Lending rate, effective tax rate and inflation rate were selected. The variables were selected by refereeing different theories and empirical studies that have been conducted on the factors that determine non-performing loan of commercial banks. Consequently, the empirical findings of this study suggested the following major findings:

- From descriptive statistics, Commercial banks in Ethiopia incurred 11.82%NPLs on averages from its total loan. According to Ethiopian context, the banking sectors are required to maintain the ratio of NPLs at least below 5% (NBE, 2008).
- Loan to deposit ratio (LTD) has a mean of 69.93% with highest deviation (49.95%) from its mean value. As far as profitability ratios is concerned, Return on asset(ROA) records a minimum of -2.13 and maximum of 11.62% with a mean value of 2.52%.
- On the other hand, Return on equity (ROE) measured by the net profit divided by total equity of the bank records a mean value of 22.64%. This implies that commercial banks in Ethiopia have relatively a good performance in terms of ROE as compared to ROA during the study period.
- Capital adequacy ratio (CAR) for the sample commercial banks in Ethiopia during study period was above the minimum requirement, which is 8%. Furthermore, and ALR demonstrates a minimum a mean value 10.99% showing 1.5% deviations from its mean. Finally, Inflation and effective tax rate ranges from a minimum of -7% to maximum of125%.

Recommendations

Based on the findings of the study the following possible recommendations were forwarded.

- In order to improve asset quality, specifically loans, it is strongly recommended that bank management and loan officers should always give a serious focus on improving asset quality of banks specifically loan performance for reducing the tendency of loan loss.
- In order to curtail the chance of occurrence of NPLs; it is better for the bank managers to give due emphasis on the asset management decision. Once assets are considered as appropriate sources of financing, these assets must be managed efficiently. Thus, it is better for the bank managers to efficiently utilize its current assets and loans than fixed assets in order to reduce the level of nonperforming loans. Besides, loan officers should provide financial counseling to the borrowers on a wise use of loan and should make decision on timely basis to meet their needs. If so, the banks management on asset utilization is improved and then reduces the level of NPLs commercial banks in the country.

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Using Static Panel Models to Assess the Experience of Islamic Banks in Algeria

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Abstract
Banking Islamic process in Algeria still subject to the regulatory which characterizes by stagnation laws of the Central Bank. giving negatively affected in their ability to create value. Summered in there's profitability indicators. So, the study aimed to focused on its evaluation for the period between 2010 and 2015 using panel models, which found a positive relationship between the return on assets ROA and the net result, and associated with a negative coefficient with the return on equity ROE, revealing an accompanying reverse for the value generated by each monetary unit invested in those banks, which exposes its balance of confidence to depreciation.
Keywords: Islamic banks, profitability, static panel, return on assets, return on equity.
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1. Introduction

The evaluating of banks and financial institutions performance are based on the significance of the financial ratios of the static profitability indicators does not explain the long-term relationship in Algeria. Whereas Islamic banks are considered relatively recent institutions compared to traditional banks. The static measurement of its performance lacks many data and information that will make its results separated in time from its reality, just as if we add to this the effect of the determinants of success for those banks that offer different theoretical formulas for monetary circulation that leads to value creation, it will be necessary to adopt more evaluation mechanisms Effectiveness in analyzing the relationship between the result and the various financial indicators that incorporate greater levels of interaction to measure the long-term relationship, as they are quantitative parameters that explain the strength of their investment options and their ability to achieve differentiation between projects with those banks and financial institutions.

1.1. problem

Quantitative measurement are the most appropriate tools for identifying the profitability of banks and financial institutions. Its adoption within purely time-based or cross-sectional models will make them tools with limited results. Therefore, the main question of the study aims to know the ability of panel models to estimate the long-term relationship between profitability indicators with the net result. You have Islamic children.

To what extent is the use of static panel models an adequate estimate of the relationship of profitability indicators to the long-term performance of Islamic banks in Algeria?

1.2. Sub-problems:

- ✓ What are the theoretical determinants in the work of Islamic banks?
- ✓ What is the nature of the effects of the central bank's relationship with the Islamic book?
- ✓ What is the standard addition in using panel models to analyze the quantitative relationship between the result and profitability indicators?

1.3. Hypotheses of the research:

The study hypotheses are related on two essential values. one of theme explain the evaluation of the relationship between the achieved result of Islamic banks in Algeria and profitability indicators, while the second hypothesis is concerned with analyzing the ability of the panel models to treat that relationship.
H1: Islamic banks have absolute ability in their investment options and the comparison between projects, which are reflected in the positive indicators of profitability.
H1: The fixed effect model is best suited to test the relationship of profitability indicators with performance.

1.4. objectives of the research

The international experience of Islamic banks in the world had a positive impact of their relative steadfastness during the mortgage crisis in 2008, as their adoption became a requirement to ensure diversification of investment