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Determinants of Commercial Bank Financial Performance: Empirical Evidence From Ethiopia

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The study examines factors that determine the financial performance of commercial banks in Ethiopia by using time series data over the period 2004-2019 on the sample of seven banks using secondary data. Moreover, the autoregressive distributed lag model was used. Under this study, both internal and external factors were included as the determinants of bank performance which was measured by loan-to-deposit ratio. The internal factors used in this study include capital adequacy ratio, non-performing loan and loan growth while the external factors are real GDP growth and inflation. Based on the results, specific variables except non-performing loan capital adequacy and loan growth affect banks performance significantly in the long run. In the short run, in addition to those two variables, non-performing loan also affects bank performance. Real GDP growth has negative significant effect on the banks performance in both long and short run. Inflation has insignificant effects on bank performances in both long and short run.

Keywords: commercial banks, financial performance, autoregressive distributed lag model

Introduction

Financial institutions are playing intermediary role in the economy through channelling financial resources from surplus economic units to deficit economic units. The determinants of financial performance can be divided into two namely, internal factors and external factors. Internal factors could be controlled by bank management. External factors are beyond the control of the banks management, the environment within which a bank operates and the industry to which it belongs (Athanasoglou, Brissimis, & Delis, 2005).

Therefore, the aim of this research is to examine the determinants of financial performance of commercial banks in Ethiopia over the period of 2004-2019. This helps the bank managers to give due emphasis on the management of identified variables and provides them with understanding of activities that enhance their bank.

Statement of the Problem

Banks play an important role in the economic development of the countries. For instance, they allocate resource and channel funds from savers to investors continuously (Okoth & Gemechu, 2013). They do so, if they get necessary earnings to cover their operational cost they incur. That is to say, for sustainable

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intermediation function, banks need to be gainful. Beyond the intermediation function, the financial performance of banks has critical implications for economic growth of countries (Okoth & Gemechu, 2013).

Ethiopian banking sector has shown a rapid progress in terms of number of commercial banks, contribution to the economy, total assets and capital, widening their branch network, increasing their outreach to remote areas and continuously reporting profits of different magnitude. Therefore in order to sustain these roles of the banking sector, empirically examination of the factor of financial performance is very necessary. Hence, a number of researches are conducted in different countries, in Ethiopia context the studies in this area are scanty. Also few researchers used regression model for analysis. Thus to fill the gap, this study is tried to answer to the current situation of bank performance by using ARDL model for analysis.

Objectives of the Study

The general objective of this paper is to examine determinants of financial performance of commercial banks in Ethiopia. The study has tried to concentrate on the following specific objectives, these are examining the impact of internal and external factor on commercial banks performance in Ethiopia and assessing the the existing relationship between dependent and independent variable.

Scope of the Study

The scope of the study was limited to see the performance of commercial banks in Ethiopia from 2014 to 2019 for seven commercial banks in the sample.

Literature Review

Different studies undertaken on the performance of banks suggest that banks performance is affected by both internal and external factors (Nassreddine, Fatman, & Anis, 2013; Okoth & Gemechu, 2013; Ezra, 2013) and these factors affect the performance of banks positively or negatively. Nassreddine et al. (2013) stated that some of the factors that affect the performance of the bank could be under the control of banks management and the others could be beyond management's control. Those factors which could be under the control of the management are called internal or bank specific factors. According to Mohana and Tekeste (2012) they are so called bank specific 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. The major internal factors that affect performance of banks include: capital adequacy, asset quality, and loan growth among others. Moreover, those factors which are beyond the management's control are referred to as external or macroeconomic factors, and these factors are real GDP and inflation among others.

Methodology

Variable Description

Table 1

Explanation of Dependent and Independent Variables Along With Their Proxies

Variable	Symbol	Equation
Capital adequacy	CAR	CAR = total $\boldsymbol{equity/totalassets}$
Asset quality	AQ	AQ = $\boldsymbol{nonperformingloans/totalloans}$
Loan growth of banks	**LG**	**LG** = $\frac{\mathbf{Lt-L(t-1)}}{\mathbf{L(t-1)}}$

(Table 1 to be continued)

Growth domestic product	GDP growth rate	GDP growth rate
Inflation rates	CPI	Consumer price index (CPI)
Bank profitability	ROA	$\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}}$
Total loans to total asset ratio	TLTA	TLTA = total loan/total asset
Liquid assets to total deposit ratio	LATD	LATD = liquid asset/costumer deposit
Total loans to total deposit ratio	TLTD	TLTD = total loan/total deposit

Population and Sampling Procedure

The study population was all commercial banks in Ethiopia including private as well as public that exist in the fiscal year 2018/19.

The frame for drawing sample included those commercial banks having at least 15 years' working experience in Ethiopia (i.e. from 2004 to 2019). There are seven commercial banks having at least 15 years' experience which include: Commercial Bank of Ethiopia (CBE), Dashen Bank S.C (DB), Awash International Bank S.C (AIB), Wogagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB) and Bank of Abyssinia S.C (BOA), Therefore, the matrix for the frame is 15*7 that includes 105 observations.

Data Presentation and Analysis

To test the proposed hypotheses, statistical analyses carried out using the following methods: First, descriptive statistics of the variables (both dependent and independent) were calculated over the sample period. Then, correlation analyses between variables were made. Finally, autoregressive distributed lag Model (ARDL) will be applied to see the long- and short-run relationship between dependent and independent variables including all of its assumptions employed.

Model Specification

The Autoregressive Distributed Lag Model (ARDL)

Appling the ARDL technique we can obtain unbiased and efficient estimators of the model. According to Pesaran, Shin, and Smith (2001), the ARDL modeling of unrestricted error correction model using Ordinary Least Square (OLS) can be represented as follows.

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{p} \beta \Delta Y_{t-i} + \sum_{i=1}^{p} \alpha \Delta X_{t-i} + \delta_1 Y_{t-i} + \delta_2 X_{t-i} + u_t \quad (1)$$

where Δ denotes for first difference operation, Y_t is for a vector of dependent variables, X_t is a vector of P determinants of Y_t regressors, U_t is the residual term which is assumed to be white noise. Basically, the ARDL approach to co-integration involves estimating of the error correction model (ECM) version of ARDL model for the determinants of bank performance is:

$$\Delta \ln LTD_t = \propto_0 + \sum_{i=1}^{p} \beta_0 \Delta \ln LTD_{t-i} + \sum_{i=0}^{p} \beta_1 \Delta \ln CAR_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta \ln AQ_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta \ln LG_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta \ln GDP_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta \ln INF_{t-i} + \theta_0 \ln LTD_{t-i} + \theta_1 \ln CAR_{t-1} + \theta_2 \ln AQ_{t-1} + \theta_3 \ln LG_{t-1} + \theta_4 \ln GDP_{t-1} + \theta_5 \ln INF_{t-1} + U_t \quad (2)$$

Whereas, LTD is loan-to-deposit ratio at time t, $\propto_0$ is intercept, β1 through to $\beta 5$ and $\theta 1$ through to $\theta 5$ are the short- and long-run coefficient respectively, CA_t is capital adequacy of bank at time *t*, AQ_t is asset quality of bank at time *t*, LG_t is loan growth of bank at time *t*, GDP_t is real GDP at time *t*, and INF_t is inflation rate at time *t*. U is the residual term, which is assumed to be white noise, *p* is the optimal lag length

and ln is natural logarithm. Except inflation, all the variables entered in the model are measured in millions of Birr.

If there is an evidence of long-run relationship (co-integration) of the variables, the following long-run ARDL (p_1, p_2, p_3, p_4, p_5, p_6) model will be estimated:

$$\ln LTD_t = \propto_0 + \sum_{i=1}^{p} \beta_0 \ln LTD_{t-i} + \sum_{i=0}^{p} \beta_1 \ln CAR_{t-i} + \sum_{i=0}^{p} \beta_2 \ln AQ_{t-i} + \sum_{i=0}^{p} \beta 3 \ln LG_{t-i} + \sum_{i=0}^{p} \beta_4 \ln GDP_{t-i} + \sum_{i=0}^{p} \beta_5 \ln INF_{t-i} + \varepsilon_t \quad (3)$$

In the presence of co-integration, short-run elasticities can be derived by constructing an error correction model of the following form;

$$\Delta \ln LTD_t = \propto_0 + \sum_{i=1}^{p} \beta_0 \Delta \ln LTD_{t-i} + \sum_{i=0}^{p} \beta_1 \Delta \ln CAR_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta \ln AQ_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta \ln LG_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta \ln GDP_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta \ln INF_{t-i} + \gamma ECT_{t-i} \quad (4)$$

where, ECT_t is the error correction term, defined as:

$$ECT_t = \Delta \ln LTD_t - [\propto_0 + \sum_{i=1}^{p} \beta_0 \Delta \ln LTD_{t-i} + \sum_{i=0}^{p} \beta_1 \Delta \ln CAR_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta \ln AQ_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta \ln LG_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta \ln GDP_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta \ln INF_{t-i}] \quad (5)$$

here Δ is the first difference operator; β's the coefficients relating to the short-run dynamics of the model's convergence to equilibrium, and γ measures the speed of adjustment.

Result and Discussion

Descriptive Statistics of the Data

The descriptive statistics for the dependent and independent variables are presented below. The dependent variable is financial performance measured by Loan-to-Deposit ratio (LTD). The remaining are the independent variables whose are capital adequacy ratio, non-performing loans, loan growth, real GDP growth and consumer price index.

The LTD which is measured by the total loan divided by total deposit has average mean value of 68.14. This implies that, the sample banks on average use 68.14 amount of loan of the total deposit. This indicates the sample commercial bank has not good liquidity performance in study period. The higher the ratio, the more the bank is relying on borrowed funds. Regarding the independent variables, capital adequacy measured by total equity divided by total asset has a mean value of 15.84. This shows that during the study period the sample commercial banks finance their own funds using equity in case of adverse situation. The maximum and the minimum value were 21.04 and 10.34 respectively with a standard deviation of 2.73. This indicates that during study period the sample commercial banks have good capital adequacy ratio.

On the other hand, non-performing loan measured by non-performing loan divided by total loan has a mean value of 10.02. This shows that during the study period the sample commercial banks has high non-performing loan from total loan. The maximum and the minimum value were 25.49 and 2.26 respectively with a standard deviation of 6.33. This indicates that in the study period the sample commercial banks have high variation in receiving nonperformance loan from total loan. The average mean of loan growth for sample commercial banks was 49,973.90 with maximum and minimum values of 177,586.6 and 11,734.00 respectively in study period with standard deviation of 47,007.10.

Table 2

Descriptive Statistics of the Variables

Variable	LTD	NPL	LG	GDP	CPI	CAR
Mean	68.14273	10.02454	49,973.90	81,067.14	68.17691	15.83581
Median	66.82731	8.908509	31,748.00	53,370.11	59.99052	16.70723
Maximum	92.22075	25.49674	177,586.6	199,900.0	152.3754	21.04461
Minimum	50.80370	2.261615	11,734.00	14,953.90	23.39434	10.33846
Std.Dev.	10.47758	6.329980	47,007.10	64,922.38	43.31371	2.732903
Obsn	63	63	63	63	63	63

Source: Author's Estimation using E-views 8.

The remaining independent variables were the macroeconomic indicators that can affect banks performance over time. The mean value of real GDP growth rate was 81,067.14 indicating the average real growth rate of the country's economy over the past 15 years. The maximum and minimum value was 199,900.0 and 14,953.90 respectively with standard deviation of 64,922.38. The average mean of general inflation rate of the country is 68.18 over the past 15 years. The maximum and minimum was 152.38 and 23.39 with standard deviation of 43.31. This indicates high inflation rate in Ethiopia during the study period.

The Unit Root Test Analysis

Table 3

Unit Root Test (Augmented Dickey-Fuller Test)

variables	With intercept			Trend and intercept		
	At level	At first difference	Order[ ]	At level	At first difference	Order [ ]
L(LTD)	-1.547	-3.766*	I[1] AT 1%	-3.240	-3.822	I[1] AT 5%
LCAR)	-1.836	-2.506		-3.369***	-2.437	I[0] AT 10%
L(NPL)	-1.097	-2.306		-4.111**	-2.240	I[0] AT 5%
L(LG)	0.8004	-2.014		-2.978	-8.549*	I[1] AT 1%
L(GDP)	-0.619	-2.963**	I[1] AT 5%	-2.207	-2.885	
L(CPI)	0.173	-5.355*	I[1] AT 1%	-2.995	-5.329	I[1] AT 1%
With constant; no trend Test critical values; AT 1% level = -3.548 AT 5% level = -2.913 AT 10% level = -2.594				With constant and trend Test critical values; At 1% level = -4.118 At 5% level = -3.486 At 10% level = -3.172		

Notes. ***, **, and * indicate statistical significant at 10%, 5%, and 1%. Source: E-views 8.1 result.

In order to determine the degree of integration, a unit root test is carried out using the standard Augmented Dickey-Fuller (ADF) test statistic. The result in Table 3 shows that there is a mixture of I(0) and I(1) but not any order two.

Loan-to-deposit ratio, growth domestic product, consumer price index, and loan growth are stationary at first difference while capital adequacy ratio and non-performing loan are stationary at level.

Long-Run ARDL Model Estimation

After confirming the existence of long-run co-integration relationship among the variables, the next step is running the appropriate ARDL model to find out the long run coefficients.

Table 4

Estimated Long-Run Coefficients of ARDL Model

Dependent variable L(LTD)			
Regressors	Coefficient	Standard error	T-Ratio[Prob]
LNPL(-2)	0.0384	0.031545	1.216[0.2291]
LLG(-1)	0.2735**	0.109522	2.497[0.0157]
LGDP(-1)	-0.1682*	0.047111	-3.572[0.0008]
LCAR(-1)	-0.5453*	0.091008	-5.991[0.0000]
LCPI(-1)	-0.0679	0.169263	-0.402[0.6897]
C	4.8083	0.923357	5.207[0.0000]
AR(1)	0.913993	0.060133	15.19943
R-squared = 0.93 F-statistics = 110.07[0.000]			
Adjusted R-squared = 0.92 Durbin – Watson stat=1.98			

Notes. * and ** indicate statistical significant at 1% and 5%. LLTD = 4.808 + 0.0384LNPL + 0.273LLG - 0.168LGDP - 0.545LCAR - 0.0679 LCPI. Source: E-views 8.1 result.

The coefficient of determination R-squared is high explaining that about 93% of variation in the bank performance is attributed to variation in the explanatory variables in the model. In addition the value of F statistics (110.07) is very high which indicates the overall model is good model. As we have seen from the above table the loan growth has a positive significant impact on bank performance at 5% significance level. This implies that a one percent increase in loan growth will result in 0.274 percent increase in loan to deposit ratio. As a result when loan growth increases the loan-to-deposit ratio also increases. But when loan-to-deposit ratio increases the bank decreases holding liquid asset. This implies the bank relying on borrowed funds.

Capital adequacy ratio has negative and statistically significant impact on loan to deposit ratio at 1% significance level. The coefficient of capital adequacy ratio (CAR) is -0.5453, indicating that one percent increases in capital adequacy ratio will decrease loan-to-deposit ratio by 0.5453 percent. This implies that an increase in capital adequacy has a negative impact on banks liquidity because the decrease in loan-to-deposit ratio depicts improvement of bank performance. Real GDP growth rate had statistically significant impact on banks performance at 1% level of significance. The coefficient sign for real GDP growth rate is -0.1682 indicating that for one percent increases in real GDP the loan-to-deposit ratio decreases by 0.1682 percent. This finding agrees with theory and empirical evidence that: the relationship between GDP trend growth and bank performance could be pro-cyclical. Theoretically, when the economy is at boom or goes out of recession, economic units including banks are optimistic and increase their long-term investment and decrease their holding of liquid assets while in the period of recession the opposite is true.

Short-Run Error Correction Model

After the acceptance of long-run coefficients of the financial equation, the short-run ECM model is estimated. The error correction term (ECM), as we discussed in Chapter Three, indicates the speed of adjustment to restore equilibrium in the dynamic model. It is a one lagged period residual obtained from the estimated dynamic long-run model. The coefficient of the error correction term indicates how quickly variables converge to equilibrium. Moreover, it should have a negative sign and statistically significant at a standard significant level (i.e. *p*-value should be less than 0.05).

Table 5

Error Correction Representation for the Selected ARDL model

Dependent variable dL(LTD)			
Regressors	Coefficient	standard error	T-Ratio[Prob]
dLNPL(-2	0.036*	0.010441	3.42[0.001]
dLLG(-1)	0.53*	0.105802	4.98[0.000]
dLGDP(-1)	-0.161*	0.013029	-12.39[0.000]
dLCAR(-1)	-0.458*	0.038148	-12.02[0.000]
dLCPI(-1)	-0.005	0.157507	-0.03[0.973]
ECM(-1)	-0.538*	0.099817	-5.39[0.000]

Note. * indicates statistical significant at 1%. Source: E-views 8.1 result.

The above result depicts that the coefficient of the error correction is at 5% significant level with -0.538 elasticity of coefficient. The coefficient of the error term (ECM-1) implies that the deviation from long-run equilibrium level of bank performance in the current period is corrected by 53.8% in the next period to bring back equilibrium when there is a shock to a steady state. According to Bannerjee et al. (2003) as cited in Kidanemarim (2014), the highly significant error correction term further confirms the existence of a stable long-run relationship.

Moreover, the coefficient of determination (R-squared) is high explaining that about 78.3% of variation in the financial performance is attributed to variations in the explanatory variables in the model. In addition, the DW statistic does not suggest autocorrelation and the F-statistic is quite robust. Unlike the long run, the non-performing loan variable significantly affects banks performance at 1 percent significance level in the short run. Even the sign is positive. Similar to the long-run result, loan growth has positive impact on bank performance and statistically significant at 1 percent significance level in the short term. Real GDP and capital adequacy ratio, have negative impact on banks performance in Ethiopia and statistically at 1 percent significance level in the short run. On the other hand inflation is still insignificant.

Recommendations

Based on the analysis part above, the researcher recommends the following information to be improved by the bank. Banks could control their loan performance by providing loan at most 50% of their deposit, because as loan increases the bank losses holding liquid asset even though gaining profit. Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market, and operational risks. Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis. Therefore banks should have to control misappropriate accumulation of asset. The average mean of non-performing loan for the sample commercial banks is high; the bank should control the non-performing loan in order to decrease loan losses by following the borrowers nearest. Bank could have the ability to control the external factors. For instants, the trend of GDP affects the demand for saving. During the declining of GDP growth the demand for saving decreases which indirectly increases loan to deposit ratio. When loan-to-deposit ratio increases the bank decreases holding liquid asset. Therefore the bank should have to contribute on economic growth of the country by financing different projects.

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