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Effect of Credit Risk Management on Business Performance of Banks Operating in Ethiopia

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Abstract
The main aim of this study was to identify the effect of credit risk management on profitability (business performance) of selected commercial banks of Ethiopia based on secondary data sources over the period of 2010-2021 G.C. The study employed a quantitative research approach with an explanatory research design. The result of regression analysis of the random effect model was applied to investigate the effect of explanatory variables on profitability.The finding of this study showed that capital adequacy has a positive and statistically significant effect on the financial performance of commercial banks in Ethiopia. Besides, variables like a loan to deposit ratio and loan provision ratio have a positive and statistically significant effect on the profitability of commercial banks. In opposite direction, non-performing loans, loan to total asset ratio, and cost per loan have a negative and statistically significant effect on ROA respectively.Apart from contributing to the body of existing literature on the effect of credit risk management on the financial performance of the banking sector, the study gives a guideline to both public and private banks in the world in general and Ethiopia in particular. It indicated that the financial performance of commercial banks can be improved by improving the credit risk management system.This study contributes by supporting that credit risk parameters such as loan to deposit ratio, loan provision, non-performing loan, loan to total asset ratio and cost per loan have a statistically significant effect on ROA respectively.
Keywords: Credit Risk, Risk Management, Commercial Banks, Sidama ,Furra college
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1. Introduction

Banks today operate in an environment marked by rising customer expectations, increasing regulatory requirements, technological innovation, and mounting competition which cannot free form different types of risks. Therefore, all banks, whatever their size (large, medium, or small), in whatever markets they operate and no matter what products and services they provide, are constantly faced with credit risk. Indeed, businesses can only prosper by successful risk-taking. In commercial banks, credit risk is considered the most important factor of earnings (profitability). Therefore, banks have to balance the relationship between credit risk and financial performance. Managing credit risk systematically and professionally becomes a more important task of bank managers. It can be said that credit risk-takers have survived, effective credit risk managers have prospered and credit risk-averse are likely to perish (Ferretti, 2007).

According to Ahmadyan (2018), sound credit risk management boosts profitability and bank survivability. Poor credit risk management reduces the profitability and survival of banks. Credit risk management is the process of managing an institution's activities which create credit risk exposures, in a manner that significantly reduces the likelihood that such activities will impact negatively a bank's earnings and capital. The commercial banks' credit risk management needs strong attention and follow up regarding performer capacity building to minimize the high incidence of non-performing loan (Kargi, 2011). Therefore, it is a significant issue to know and understand the effect of credit risk management and its influence on the financial performance of commercial banks of Ethiopia.

The perior different studies have been addressed the current topic area and reached a different conclusions. For instance, Tadesse (2014), Girma (2011);Tesfaye (2018); Hempel (2019); Million, Matewos, and Sujata (2015); Agegnehu (2013); Mekasha (2011); and Tibebu (2011) addressed the effect of credit risk management on profitability of banks by selecting private commercial banks as the sample. Hence, the aforementioned studies failed to disclose the literature gap by incorporating those government commercial banks operating in Ethiopia in their samples. Also, they didn't consider capital adequacy and loan to asset ratio as the explanatory variable. Therefore, this study incorporated both government and private commercial banks and tried to disclose the variable incorporation gap, and incorporated capital adequacy and loan to asset ratio as additional independent variables. So, the objective of this study, to disclose the effect of credit risks management indicators such as capital adequacy ratio non-performing loan ratio, loan to deposit ratio, loan to total asset, loan loss provision, and cost per loan on the profitability of selected commercial banks from 2010 up to 2021 G.C.

2. Review of Related Literature

2.1. Meaning of credit risk

Credit risk bank business performance is the risk of a loss resulting from the debtor's failure to meet its obligations to the bank in full when due under the terms agreed).Credit risk is the potential that a bank borrower or counterparty will fail to meet its obligations following agreed terms (Raghavan, 2003; Tadesse, 2014; Koulafetis, 2017; Dvorsky, Schonfele, Kotaskova, and Petrakova, 2018). Generally, the credit risk is associated with traditional lending activities of banks and it is simply described as the risk of a loan not being repaid in part or in full. Credit or default risk is the risk that the promised cash flows from loans and securities held by financial institutions may not be paid in full. Should a borrower default, both the principal loaned and the interest payments expected are at risk (Saunders and Cornett, 2007). Credit risk is a risk of default on a debt that may arise from a borrower failing to make required payments (Zou& Li, 2014). In the first resort, the risk is that of the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs.

2.2. Credit risk management and Bank Business performance

Credit risk management is the practice of mitigating losses by understanding the adequacy of a bank's capital and loan loss reserves at any given time a process that has long been a challenge for the financial institution. Experiences elsewhere in the world suggest that the key risk in a bank has been credit risk (Brown, & Moles, 2014).Credit risk management means the process of risk identification, measurement, monitoring, and control (Amanda, 2014). Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Additionally, banks should be aware that credit risk does not exist in isolation from other risks, but is closely intertwined with those risks. Effective credit risk management is the process of managing an institution's activities which create credit risk exposures, in a manner that significantly reduces the likelihood that such activities will impact negatively on a bank's earnings and capital (Alshatti, 2015). Credit risk is not confined to a bank's loan portfolio, but can also exist in its other assets and activities (Yhip, &Alagheband, 2020).Likewise, such risk can exist in both a bank's on-balance sheet and its off-balance-sheet accounts.

2.3. Principles of Credit Management

According to Yhip andAlagheband (2020) and Samreen, Zaidi, &Sarwar (2013) assert that banks have traditionally focused on the principles of five Cs' to estimate borrowers' creditworthiness. These are:
i) Character -refers to the borrower's characteristics such as honesty, willingness, and commitment to payingthe debt. Borrowers who demonstrate a high level of integrity and commitment to repay their debts are considered favorable for credit. ii)Capacity- refers to borrowers' ability to contain and service debt judging from the success or other wises of the venture into which the credit facility is employed. Borrowers who exhibit successful business performance over a reasonable past period are also considered favorable for the credit facility.iii)Capital- refers to the financial condition of the borrower. Where the borrower has a reasonable amount of financial assets above his financial liabilities, such a borrower is considered favorable for the credit facility. Iv) Collateral- are assets, normally movable or unmovable property, pledged against the performance of an obligation. Examples of collateral are buildings, inventory, and account receivables. Borrowers with a lot more assets to pledge as collateral are considered favorable for the credit facility and v) Condition- refers to the economic situation or condition prevailing at the time of the loan application. In periods of recession, borrowers find it quite difficult to obtain a credit facility.

2.4. Meaning and Measure Of Profitability

Profitability is a business's ability to produce a return on assets invested. So return on asset is a financial ratio that shows the percentage of profit that acompany earns concerning its overall resources. It is known as a profitability or productivity ratio, because it provides information about how managements are efficient at using their assets to generate earnings and to measure their progress against predetermined internal goals, a certain competitor, or the overall industry (Zergaw, 2015). It shows the profit earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues. It measures how well the institution utilized itsassets. It is also an overall measure of profitability that reflects both the profit margin and the efficiency of the institutions. Studies such asFlamini, McDonald, and Scumacher,(2009);Zeleke (2019); Unuafe (2013); Kargi (2011); Girma (2011); Tibebu (2011); Agegnehu (2013); andAhmadyan (2018) were employed return on assets (ROA) as the measurement of profitability to measure bank business performance.Inthisstudy, returnon asset (ROA) was applied as thedependent variable.

2.5. Empirical Review

Credit risk is among the very important risks considered in the banking industry. It has a significant effect on bank business performance. So the empirical findings concerning the relationship between credit risk indicators

such as capital adequacy ratio non-performing loan ratio, loan to deposit ratio, loan to total asset, loan loss provision, and cost per loan and profitability were reviewed by the researcher as follow:

a) Capital adequacy and profitability

Capital adequacy ratio is a measure of a bank's financial strength expressed by the ratio of its capital (net worth and subordinated debt) to its risk-weighted credit exposure in the form of loans Sukmadewi(2020); forwarded that capital is an important variable in determining bank profitability and a well-capitalized bank could provide a signal to the market that a better-than-average performance should be expected (Amanda, 2014). Well-capitalized banks are less risky and generate lower profits as they are perceived to be safer. According to Lloska (2014),well-capitalized banks face a lower cost of going bankrupt which reduces their cost of funding and are considered relatively safer and tend to have a better margin of profitability. The empirical studies by Unuafe (2013); Tenriola (2019); Ozil (2017; Miranda (2018); Sangmi andNazir (2020); Datta and Mahmud (2018); Naceur (2003); Ajayi, Ajayi, Enimola, and Orugun, (2019), Deyganto, &Kumari (2019) and Nguyen (2020) were found out that there is a positive relationship between capital adequacy and bank financial performance. The higher the capital ratio, the more profitable a bank will be. For this study, the following hypothesis is formulated:

H1: Capital adequacy has a positive and statistically significant impact on profitability

b) Non –performing loans ratio (NPL) and profitability

The non-performing loan ratio is a ratio that measures the proportion of non-performing loans againstthe total loans for a period. It gives an assessment of the total borrowers default on the conditions of loans and advances for loans and ancestor a given period. Non- performing loans are also commonly described as loans in arrears for at least ninety days and they canbe detreated as undesirableoutputsor costs to loaning banks which decreases the bank's performance (Guy & Lowe, 2011). It is indicated by the amount of NPLs to total loans and advances. According to Miranda (2018); Tadesse (2014); Tesfaye (2018) and Bhattarai (2020),there is a negative association between a non-performing loan and the financial performance of the banks. Therefore, it can be hypothesized that:

H2: Non-performing loan hasa negative and statistically significant impact on profitability

c) Loans to deposit ratio and profitability

Loan to deposit ratio is the bank capability valuations in repaying the funds redemption that is done by the depositors by depending on the credits that are allocated as liquidity sources. It is the most important ratio to measure the liquidity condition of the bank in terms of deposits. The banks of Ethiopia's banking industry, this implies that when loans and advances increase. Here, loan means financial empirical studies include Apriani (2020); Miranda (2018); Roslan and Rauf (2019); Sari and Septiano (2020); Sianturiand Rahadian (2020); Tadesse (2014were suggested that loan to deposit ratios have a positive effect on banks profitability. Hence, it can be hypothesized as:

H3: Total loanstodeposit ratio positive and statistically effect on profitability

d) Loan to total asset and profitability

According to Alunbas (2005), loan to total asset measures the percentage of assets that are loans and the exposure level of the bank to credit risk. He has investigated banks with higher loan to total asset ratiosthat have high exposure to credit risk and affect the financial performance negatively. The ratio of loans to a total asset mainly measures a bank's exposure to credit risk through converting the deposits liabilities they collected from customers to pertinent borrowers, bank loans are expected to be the main source of remained are expected to have a positive impact on bank performance. Other things constant, the moredeposits are transformed into loans, the higher the interest and profits. However, if a bank needs to increase the risk to have a higherloan-to-asset ratio, then profits may decrease Tadess (2014); Doyran (2012); and Miranda (2018). Therefore, the researcher can develop the tentative statement as:

H4: Loan to total assets has a statistically significant and negative effect on profitability.

e) Loan loss provision to total loans and profitability

The bank is regulated to back up the bad debts by providing adequate provisions for loan losses. The ratios of provision for loan loss to total loans take into account to measure the quality of the loan portfolio. Lana loss provision is an expense seaside as allowance for uncollected loans and loan payments. This provision is used to cover several factorsassociated with potential loan losses including bad loans, customer defaults, and renegotiated term sofa loans that incur lower than previously estimated payments. The loan loss provision is a balance sheet account that represents a bank's best estimate of future loan losses, it the LPTL becomes high, theprovision for loan losses should be probably high. According to Altunbas (2005);Miranda, (2018); Tadesse (2014); Lucky and Nwosi (2015); found that there is a positive relationship between loan loss provision and profitability. Such a situation is happen in cases of countries having well-managed credit risk as revealed in the lowest hare of nonperforming loans from their loan books. It has a positive relationship with financial performance when the development banks have estimated the future loan losses carefully.

H5: Loan loss provision has a statistically significant and positive effect on profitability.

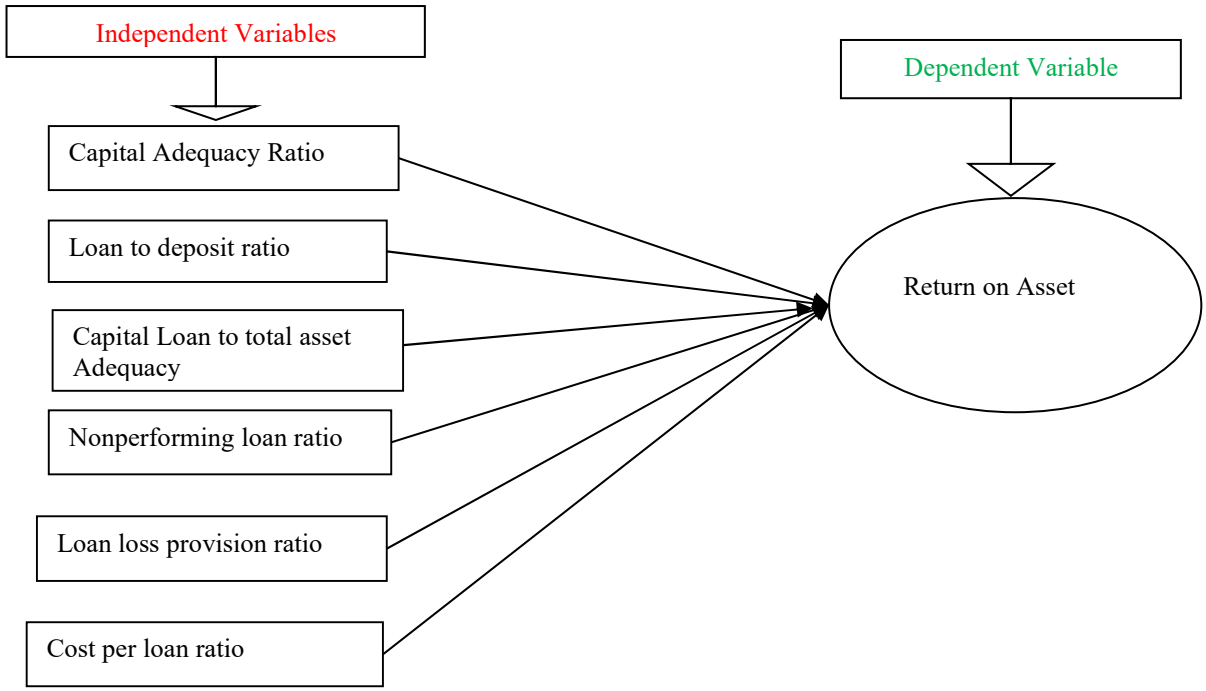
f) Cost per loan assets and profitability

Cos per loans asset is the average cost per loan advanced to the customer in monetary terms, Purpose of this is to indicate efficiency in distributing loans to customers. Different researchers have tried to show the relationship between cost per loan assets and financial performances of commercial banks. To this end, Paudel (2012); Nwanyanwu (2014); Rex (2016); Tadesse (2014); Akula (2012); Kurawa and Garba (2014); Bhattarai (2017); has founda negative and statistically significant association between cost per loan assets (CLA) and bank profitability (ROA); this is in line with researcher expectation. That means, there is a negative relationship between cost per loan asset and financial performance of development banks.

H6: Costs per loan asset has a negative and statistically significant effect on profitability

2.6. Conceptual framework of the study

Conceptually, the study delaminated to identify the effect of seven explanatory variables such as capital adequacy, non-performing loan, Loan to deposit ratio, loan to total asset, Loan loss provision, and Cost per loan on one dependent variable which is the financial performance of development of Bank of Ethiopia by adopting random effect model. This has shown as follow:



Source: Researcher Own design from the empirical reviewed (2021)

Figure1: Conceptual frameworks of the study

3. Research Methodology

3.1. Research design and approach

The amin objectives of this study was to investigate the cause and effect relationship between financial performance and its determinants (credit risk management system) in Banks operating in Ethiopia .Thus, a quantitative research approach with explanatory study design was used

3.2. Targeted population, sample size, and selection techniques

Target population refers to the population to which the study findings are generalized. The study was conducted on nine (9) oldest Ethiopian banks such as the commercial bank of Ethiopia, dashen bank, awash international bank, Abyssinia bank, co-operative bank of Oromia, wegagen bank, united bank, nib international bank, and lion international bank. The characteristics of the members of the target population are similar except being state-owned and privately-owned. The population of the study is eleven are similar except being state-owned and privately-owned. The population of the study is eleven (11) consecutive years' financial statements and nine oldest purposively selected banks (9*11) = 99 number of the observation; out of eighteen (18) targeted population of currently operating in Ethiopian commercial banks. The sampling size of the study was nine oldest banks purposively selected banks and their 11 years audited financial statements. Thereason why purposively selecting the size of the sample is due to obtain 11 years audited financial statement of the banks because all banks do not have 11 years audited financial statement; particularly those which have not been

founded before ten years.

3.3. Source of Data and methods of data collection

To investigate the effecte of creidt risk management on bank perfromance in ethiopia banks ,this study,was used secondary data sources from national bank of Ethioopia . It has been collected through a document review of nine(9) selected commercial banks with 11 years of audited reports from 2010-2021.

Measurement of dependent and independent variables

Table 1: Measurement of dependent and independent variables,

Category	Variables	Measurement	Expected sign
Dependent variable	Return on Asset (ROA)	ROA = Net income/total Asset	
Independent Variables	Capital Adequacy ratio (CAR)	CAR = Equity /Total Asset	+
	Non-performing loan (NPL)	NPL= Ratio=Non-performing loans ÷Total loan amounts	_
	Loan to total Deposit Ratio (LDR)	LDR = Total loans and advance÷ Total Deposits	+
	Loan to total Asset Ratio (LTA)	LTA Ratio=Total loans ÷ Total Assets	_
	Loan provision Ratio (LPR)	LPR = loan loss provision ÷ Total Loans	+
	Cost per loan (CLA)	CLA Ratio= Total operating cost ÷Total amount of loans	_

Source: Researcher own work from literature review (2021)

3.4. Data analysis tools

To meet the objective of the study, the research was employed primarily based on panel data, which was collected through structured document review. The advantage of using panel data is that it controls for individual heterogeneity, less Collinearity among variables,and tracks trends in the data something which simple time-series and cross-sectional data cannot provide (Brooks,2008). The collected panel data were analyzed using descriptive statistics, correlations, multiple linear regression analysis so as investigate the relationship between dependent and independent variables. And also,the multiple linear regression approach including all of its assumptions was tested. The panel data which were collected from nine (9)banks of Ethiopia was analyzed by using E-views 9 softwarepackage.

3.5. Regression models specifications

Since the dependent variable of the study was financial performance measured through ROA, the multiple regression model was employed due to the quantitative nature of data (return on asset). This study used ROA, as dependent variables whereas capital adequacy, non-performing loan, loan to deposit ratio, loan to total asset ratio, loss provision, and cost per loan are used as explanatory variables. Therefore, the models which incorporate all of the variables to test the hypotheses of the study are specified as follows:

ROAit= ROAit= $\beta 0 + \beta 1 * CARit + \beta 2 * NPLit + \beta 3 * LDRit\beta 4 * LTAit + \beta 5\ LPRit + \beta 6 * CLAit + \varepsilon it$.....(1) the sing in the model reveal the expected relationship between the dependent variable and explanatory variables. Where:

ROA= Return on asset

$$\beta 0 = the\ constant\ term$$

CA= Capital adequacy of 1thbank at timet

NPL=Non performing loan of 1thbanks at time t

TPLT= Loan loss provision of 1thbank at time t

LDR= Loan to total Deposit ratio of 1th banks at time t

CLA = Cost per loan of 1th banks at time t

LTA= Loan to total asset ratio of1thbanksat time t

$$\varepsilon it = the\ error\ term$$

$\beta 1 - \beta 6\ are\ cofficents$

4. Results of the study

4.1. Descriptive statistics

This section presents the descriptive statistics of dependent and independent variables used in the study for the sampled commercial banks operating in Ethiopia. The dependent variables used in this study were ROA while the independent variables were capital adequacy, non-performing loan,loan to deposit ratio, loan to total asset,

loan loss provision, gearing ratio, and cost per loan. Table 4.1 demonstrates the mean maximum and minimum values and standard deviation of the dependent and independent variables over the study period.

Table 2: Summary of descriptive statistics

Variables	Financial Performance	Capital Adequacy	Non-performing loan	Loan to Deposit Ratio	Loan to Total asset Ratio	Loan provision	Cost per Loan
Mean	0.035658	3.780646	4.737588	4.481661	3.592815	7.698209	0.006141
Maximum	0.095300	7.385400	8.293300	7.38490	11.87560	9.854500	0.057200
Minimum	0.005300	0.245500	1,180500	1.055600	1.104600	5.118900	0.001200
Std. Dev.	0.027387	2.002547	2.147120	2.420117	2.642594	1.530665	0.009079
Observations	99	99	99	99	99	99	99

Source: Computed from E- views 9 results (2021)

According to table 2above, the profitability of commercial banks as measured by ROA (net income to total asset) for 99 observations (panel data of 9 banks for 11 years) has a mean value of 3.5 percent. The result indicates that, the sampled branches on average a profit of 0.0356558 cents from one birr invested in the asset. The maximum value of the ROA was 9.53 percent and the minimum value of 0.5 percent with a standard deviation of 0.0276. This shows that profitable branches earned 0.0953 cents of profit for a single birr invested in their assets. On the other hand, the least profitable banks earned 0.0053 cents of profit for each birr invested in their assets during the study period. Capital adequacy has also hada mean value of 378.0646 percent. The mean value result suggested that 3.780646 cents of one birr asset were financed by shareholders' equity while the remaining 96.2194 cents was financed through debt. The maximum value of capital adequacy was 73.84400 percent and the minimum value of 24.5500 percent with a standard deviation of 2.002547. This shows that sampled banks financed their one birr asset using shareholders' equity range from 0.245500 cents to 7.385400 cents. On the other hand, the mean value of the non-performing loan was 4.73 which indicates that the average ratio of NPL over the total is more than 1 percent. The maximum of this ratio is 8.29 percent and the minimum value is 1.18 percent. The maximum value of 8.29 indicates the presence of high credit risk in some of the banks. The standard deviation for NPLR of shows the deviation of 2.14 from the average mean value among banks' credit risk exposure. This implies that the presence of non-performing loans of banks ranges from 1.18 percent to 8.29 percent.

Concerningthe loan to deposit ratio, the minimum loan to deposit ratio (LDR) is 105.56 and 738.40 of maximum with the mean value of 448.16 percent. And has a relatively large deviation for the mean value by 242.01 percent among the independent variables. High LDR indicates that a bank has taken more credit risk by making excessive loans and also shows the risk that to meet depositors' claims bank may have to sell some loans at loss. Therefore, figure 7.38 shows the maximum need to increase profit and engagementin giving loans to the customers according to the deposit collected. The mean value is varying from minimum and maximum value by 2.4201.Regards loan to total asset, the mean value of the loan to the total asset (LTA) is 359.28 percent with the minimum and maximum of 1187.56 percent and 1104.60 respectively, and has 264.25 deviations from the mean value which implies there are significant differences among values of loan to the total asset (LTA).Concerning the loan loss provision, the mean value of loan loss provision to total loan (LPTL) is 769.82 with a minimumof 511.89 percent and a maximum of 985.45 percent. The standard deviation of statistics for LPL has shown a 153.06 percent deviation from its mean value. The maximum of 985.45 reserved or estimated per loan for future loan loss that would happen from bad loans, customer defaults, and renegotiated terms of a loan that incur lower than previously estimated payments to protect the financial performance of commercial banks. Finally, the mean value of cost per loan is 0.6 percent indicates the cost incurred by the bank in providing one unit of loan maximum of 0.006 cents. The minimum and maximum of 0.12 percent and 5.72 respectively. The standard deviation of statistics for CLA shows that the maximum and minimum valuesare 0.90 percent from its mean.

4.2. Correlation analysis among variables

According to (Brooks, 2008), Correlation between two variables measures the degree of linear association between them. To find the association of the independent variables with the dependent variable Pearson product-moment of correlation coefficient was used. Values of the correlation coefficient between two variables are always ranged from positive one to negative one. A correlation coefficient of positive on indicates that a perfect positive association between the two variables; while a correlation coefficient of negative on indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other negative, indicates that there is no linear relationship between the two variables. The following tables show the result of correlation analysis to determine the relationship between the dependent variable (ROA) and explanatory variables (i.e., capital adequacy, non-performing loan, loan to deposit ratio, loan to total asset, loan loss provision, and cost per loan).

Table 3 :Correlation matrix of ROA and Explanatory Variables

Variables	ROA	CAR	NPL	LDR	LTA	LPR	CPL
ROA	1	0.44907	0.2120	0.6353	-0.5508	-0.4168	0.0012
CAR	0.4490	1	0.4913	0.49343	0.4237	-0.4226	0.0626
NPL	0.2120	0.4913	1	0.6722	-0.4470	0.63895	0.0265
LDR	0.353	0.49349	0.67227	1	-0.7239	0.8746	0.2042
LTA	-0.5508	-04237	-0.4470	-0.7239	1	0.7059	-0.1645
LPR	-0.4168	-0.4226	-0.6389	-0.8746	0.7059	1	-0.2305
CPL	0.0012	0.0626	0.0265	0.0242	-0.1645	-0.1645	1

Source: Computed from E-views 9 result (2021)

As shown in table 3 above capital adequacy, none performing, loan to deposit ratio, cost per loan were positively correlated with ROA with a correlation coefficient of 0.4490,0.2120, 0.6353, and 0.0012 respectively. This correlation shows that capital adequacy (CAR), none performing loan (LPR), loan to deposit ratio (LDR), and cost per loan (CPL) were increased return on assets and also moves in the same direction. Other variables loan to the total asset (LTA) and loans provision (LPR) with a coefficient (-0.5508) and -04168) were negatively correlated with ROA. This implies that as the variables increases, the return on asset moves inthe opposite direction.

4.3. Regression result

Ordinary least squares (OLS) is the most common estimation method for linear models and that's true for a good reason. As long as the research model satisfies the OLS assumptions for linear regression, we can rest easy knowing that we're getting the best possible estimates. When running a multiple regression, there are common assumptions that your need to check research data meet and the analysis to be reliable and valid. In this study, the most common assumptions such as multicolor linearity, autocorrelation, and heteroscedasticity have been tested before running the final regression result and fully satisfied.

Table 4: Random effect model regression result: dependent variable (ROA)

Dependent Variable:ROA				
Method: panel EGLS (cross-section random effects)				
Data : 11/26/2021 Time: 07:33				
Sample: 2010-2021				
Periods included: 11				
Cross-sections included :9				
Total panel (balanced) observations:99				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Capital Adequacy	0.003323	0.001047	3.173332	0.0021***
Non-performing loan	-0005567	0.0001177	-4.729814	0.0000***
Loan to deposit ratio	0013055	0.001675	7.795106	0.0000***

Source: computed from E- views 9 results (2021)

Loan to total asset	-0.002251	0.001004	-2.22253	0.0274**
Loan loss provision	0.009693	0.002514	3.855129	0.0002***
Cost per loan	-0.506349	0.211556	-2.393447	0.0187**
Constant	-0.085518	0.032251	-2651620	0.0094***
	Effects specification			
			S.D.	Rho
Cross-section random			0.000000	0.0000
Idiosyncratic random			0.017188	1.0000
	Weighted statistics			
R-Squared	0.640641	Mean dependent variable		0.035658
Adjusted R-squared	0.612998	S.D. dependent variable		0.027387
S.E. of regression	0.017037	Sum squared reside		0.026415
F-statistic	23.17555	Durbin-Watson stat		1.515565
Prob (F-statistic)	0.00000			

The estimation result of the operational panel regression model used in this study was presented in Table 5 above. R-squared was mensued the goodness soffit of the explanatory variable sine explaining the variations in profitability measured by ROA. As shown in the table above, the R-squared statistics of the model were 64.06 percent. This result indicates that 64.06 percent variation in the dependent variables was explained by the

explanatory variables in the model. That means the explanatory variables (capital adequacy, non-performing loan, loan to deposit ratio, loan to total asset, loan loss provision, and cost per loan are jointly explain about 64.06 percent of the variation in the return on asset. The remaining 35.94 percent of the variation in the profitability (as measured by return on asset) is explained by other variables which are not included in the model. For panel data R^2 greater than 20 percent is still large enough for the reliable conclusion. Since the R^2 of the model was more than 20 percent, these variables jointly have more explanatory power of the variation in the profitability of commercial banks in the study period. From table 5 above, their searcher found the following estimated regression equation;

ROA= 0.0855+0.003323*CAit-0.005567*NPL it +0.013055* LDR it + 0.002251* CTA it +0.009693* LMLP it +0.020344* GR it -0.506349* CLA it +εit.....(2)

Besides the F-statistics (23.17555) which is used to test the overall significance of the model was presented, and nullhypotheses is canberejected at 1 percent level of significance, since the p-value was (0.0000) which was sufficiently low, indicates the reliability and validity of the model at 1 percent level of significance. The coefficients of capital adequacy, loan to deposit ratio, Loan loss provision, and gearing ratio 0.003323, 0.013055, and 0.009693 respectively show that one unit changes in capital adequacy, loan to deposit ratio, and loan loss provision will have 0.003323, 0.0013055, and 0.009693 change onthe financial performance of DBE with the same direction respectively. On the other hand, non-performing loan, loan to total asset and cost per loan -0.005567,-0.002251 and -0.506349 respectively affects profitability negatively which means the on a unit of non-performing loan, loan to total asset and cost per loan has a 0.005567, -0.002251 and -0.506349 unit change on commercial banks financial performance to the opposite direction. Based on the results shown in table 5 above, all explanatory variables had a statistically significant impact on profitability meansreduced by return on asset. Among the significant variables loan to total asset and cost per loan was statistically significant at a 5 percent significance level the p-value of the variables were (0.0274) and (0.0187). Whereas variables like capital adequacy, non-performing loan, loan to deposit ratio, and loan loss provision were statistically significant at a 1 percent significance level with a p-value of (0.0021), (0.0000), (0.000), and (0.0002) respectively. Finally, the gearing ratio is not statistically significant even at a 10 percent significance level with a p-value of (0.4373).

4.4. Discussion

The main objective of this study is to analyze the effect of credit risk on the financial performance of the development bank of Ethiopia. Based on previous studies and the finding of this study, this section discussed the general result obtained via random Effect regression model as shown in the above table 5. Referring to the literature, theresult of each explanatory variable including their impact on the level of ROA was discussed. To test these hypotheses, the study employed random-effect generalized least squares (GLS). By considering the research hypotheses; first capital adequacy, has regression results as shown in Table 5 confirmed that the variable has a positive and statistically significant effect on ROA with a regression coefficient of ($\beta = 0.003323$) and the p-value is 0.0021 at a 1% significance level. so, the researcher accepted H1. This finding is consistent with findings of studies by Tenriola (2019); Ozili (2017); Miranda (2018); Sangmi and Nazir (2010); Datta andMahmud (2018); Naceur (2003); Ajayi et al. (2019);Deyganto&Kumari (2019) and Nguyen (2020 were found out that there is a positive relationship between capital adequacy and profitability. This indicates that well-capitalized financial institutions face lower costs of going bankrupt, which reduces their cost of funding, or that they have lower needs for external funding which results in higher profitability.

The regression result of this study showed that non-performing loan has a negative and statistically significant effect on the ROA of banks with ($\beta = 0.005567$) and are significant at a 1% level of significance because of the p-value of 0.0000<0.01. therefore, the researcher accepted H2. This finding is similar to findings of studies by Million et al. (2015); Miranda (2018); Tesfaye (2018) and Bhattarai (2020); Tadesse (2014) and Mekasha (2011) who invest gated that there isa significant negative association between non-performing loan and financial performance of the bank, which is supported the researcher expectation and in line with the studies. Also, the regression result bout loan to deposit has positive and statistically significant effects on profitability of the commercial banks with regression coefficient($\beta = 0.002251$) at 1% significance level since p-value of (0.00) <0.01. So the researcher accepted H3. This finding is consistent with the findings of Amimul (2014); Aprianit (2018); Miranda, (2028); and Roslan and Rauf (2019) who found out that the loan to deposit ratio has a positive effect on banks profitability. This implies that a one-unit increase in the loan to deposit ratio increases the profitability of the banks. The regression result of this study showed that it has a negative and statistically significant effect on ROA of banks with ($\beta = -0.002251$) and significant at 5% level of significance because the p-value of 0.0274<0.05. Therefore, the researcher accepted H4.this finding is consistent with the regression result of Altubas (2005) Tasesse (2014); Doyran (2012);and Miranda (2019) supports the researcher expectation (H4) which is there is a negative relationship between credit risk indicator loan to total asset and profitability of the bank (ROA).this implies that a one-unit increase in the loan to deposit ratio decreases the profitability of the banks.

Additionally, this study confirmed that loan loss provision to the total loan with a regression coefficient of ($\beta = 0.009693$) has a positive and statistically significant effect on the financial performance of banks at 1% level of significance because p-value of 0.0002<0.01.hence, the researcher accepted H5.this finding is supported by Altunbas (2005); Million et al. (2015); Miranda, M. (2018); Li and Zou (2017) and Lucky and Nwosi (2015) who found loan loss provision has a positive effect on the financial performance of banks by protecting the banks of Ethiopia before becoming insolvency due to credit risk. The researchers found that it has a positive relationship with financial performance when the banks have estimated the future loan losses carefully. Finally, theregression result concerning cost per loan assets ratio with a regression coefficient of ($\beta = -0.506349$) showed that cost per loan assets ratio hurtsthe financial performance of banks. So the researcher accepted H6. The researcher findings supported by Paudel (2012);Tadesse (2014); Nwanyanwu (2014); Rex (2016); Akula (2020); Bhattarai (2017) who were found a negative and statistically significant association between cost per loan assets and bank profitability (ROA) and the hypothesisis supported.

5. Conclusions

Based on the findings from the descriptive analysis, the researcher can conclude that selected commercial banks were averagely generating positive ROA. Based on the findings from the regression analysis of the model, the researcher concludes that the profitability of commercial banks was best explained by the explanatory variables included in the model. The conclusion that can be drawn from the findings in the first hypothesis under the summary of the findings was, can be concluded that capital adequacy has a positive and statistically significant effect on ROA; which means an increase in the value of this variable leads to an increase in profitability of commercial banks in Ethiopia based on the findings related to the second hypothesis, the non-performing loan has a negative and statistically significant effect on ROA; which shows that a decrease on the value of this variable leads to increase on the financial performance of banks measured by ROA. The conclusion that can be drawn from the findings of the third hypothesis can be concluded that a loan to deposit has a positive and statistically significant impact on ROA; which means an increase in the value of this variable leads to an increase in earning of banks measured by ROA. Based on the findings related to the fourth hypothesis, it can be concluded that the loan to asset ratio has a negative and statistically significant effect on ROA. This means that a decrease in the value of this variable leads to an increase in ROA. Based on the findings related to the fifth hypothesis, it can be concluded that loan provision has a positive and statistically significant impact on ROA. This means that increase in the value of this variable leads to an that cost per loan has a negative and statistically significant effect on ROA; which indicates that a decrease in the value of this variable leads to an increase in the financial performance of selected commercial banks measured by ROA.

6. Future Research Direction

This study was not an end to itself. Many issues arise from the findings and may require further research to address them. For instance, a study can be carried out to establish the other factors that can explain 35.94 percent variation in the ROA regression model. And this study identifies only limited organization-specific variables of credit risk management for only 9 selected commercial banks of Ethiopia based on published financial statements from 2010 up to 2021. Researchers can conduct the further study by including more organization-specific, industry-specific and macroeconomic variables that affect the financial performance of all commercial banks of Ethiopia. And they can be carried out by increasing the sample size by incorporating more study periods. The same study may be replicated later to find out if the situation remains the same or there will be substantial changes. Future researchers can conduct a comparative study of commercial banks and government banks in the account.

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