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Original Article

The Effect of Asset Diversification on Profitability of Commercial Banks in Ethiopia

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Abstract

Background: Asset diversification is a crucial strategy for commercial banks to manage risk and enhance profitability. This study investigates the impact of asset diversification on the financial performance of Ethiopian commercial banks.

Methods: A panel regression analysis was conducted using secondary data from eight commercial banks in Ethiopia over the period 2011-2020 (80 observations). The study examined the relationship between asset diversification (measured by loans and advances, financial assets, cash and cash equivalents, and fixed assets) and profitability (return on assets).

Results: The regression model was statistically significant (p-value < 0.000), indicating that asset diversification has a measurable impact on profitability. Specifically, the study found that: Loans and advances had a positive and statistically significant effect on profitability. Conversely, financial assets exhibited a negative and statistically significant effect. Likewise, Cash and cash equivalents had a negative and statistically significant effect. However, fixed assets did not show a statistically significant relationship with profitability.

Conclusion: The findings suggest that Ethiopian commercial banks should strategically diversify their asset portfolios towards loans and advances while being mindful of excessive holdings in financial assets and cash. This approach can potentially improve profitability and contribute to sustainable financial performance.

Keywords: Asset diversification, portfolio, profitability

Introduction

Commercial banks play a critical role in the economic development of any nation by providing financial services to individuals, businesses, and governments. However, the profitability of these banks is crucial for their sustainability and growth (1). In recent years, the Ethiopian banking industry has experienced significant growth, with the number of commercial banks increasing from 4 in 1999 to 33 in 2023(2). This rapid growth has created intense competition among banks, making it challenging for them to maintain profitability (3).

Asset diversification is a strategy that commercial banks can use to improve their profitability by expanding their investment portfolios beyond traditional banking activities. Asset diversification can include investments in securities, real estate, and other financial instruments (4). By diversifying their assets, commercial banks can reduce their exposure to risks and increase their potential returns (5). However, the effect of asset diversification on the profitability of commercial banks in Ethiopia has not been well studied. Previous studies have focused on the impact of asset quality, capital adequacy, and liquidity on bank profitability [6]. Moreover, the Ethiopian banking industry is characterized by a high level of government intervention, which can affect the ability of commercial banks to engage in asset diversification [7]. Therefore, this study aims to investigate the effect of asset diversification on the profitability of commercial banks in Ethiopia.

Problem statement

Commercial banks have a significant impact on a nation's development. A vital prerequisite for economic growth is a sound, forward-thinking, and dynamic banking system. A healthy and prosperous banking industry is better able to resist adverse shocks and add to the financial system's stability (8). Since the advantages of diversification were advanced by Markowitz' Portfolio Theory, diversification has been on the agenda of strategic management of enterprises and financial institutions in terms of value maximization. In the traditional financial theory, risk aversion and diversity are two concepts that go together. A well-diversified portfolio, in Markowitz's opinion, will have a lower risk due to its decreased unsystematic risk, which leaves the portfolio just vulnerable to market risk. As a result, well-diversified portfolios should yield a larger return per unit of risk than undiversified ones, which will carry risk at no additional benefit (9).

Putting all of one's eggs in one basket is a dangerous move (10). As a result, diversifying your portfolio of investments is a key financial principle. A rapid, unexpected outcome is less likely when investments are spread across a number of unrelated investments. A loss (risk) in one investment is balanced out by gains in another in a diversified portfolio (11).

Diversification and its implications on performance are currently receiving a lot of attention from academics, policymakers, and philanthropists. Diversifying one's asset holdings can boost his/her performance. Many businesses' low profitability is caused by underperforming assets. Academics have experimentally investigated the link between assets and bank profitability (1,5,11). However, there hasn't been much research done on the topic in the context of Ethiopian banking. Therefore, it is important to study how asset diversification affects Ethiopian commercial banks' financial performance.

Objective of the study

General objectives of the study

The general objective of the study was to examine the effect of asset diversification on the profitability of selected commercial banks in Ethiopia.

Specific objectives of the study

- To identify the effect of financial asset on the profitability of commercial banks in Ethiopia
- To identify the effect of loan and advance on the profitability of commercial banks in Ethiopia
- To identify the effect of cash and cash equivalent on the profitability of commercial banks in Ethiopia.
- To identify the effect of fixed asset on the profitability of commercial banks in Ethiopia

Literatures review

Theoretical aspects of Bank asset diversification

Bank asset diversification refers to the practice of commercial banks expanding their investment portfolios beyond traditional banking activities, such as lending, to include other financial assets. Theoretical literature on bank asset diversification has explored its potential benefits and risks, as well as the optimal level of diversification for banks. Here is a review of some of the key theoretical aspects of bank asset diversification:

Efficiency and risk management: One of the primary motivations for bank asset diversification is to improve risk management and increase efficiency. By diversifying their assets, banks can reduce

their exposure to risks associated with individual assets or markets, and improve their overall risk-return profile (12).

Capital accumulation and allocation: Asset diversification can also help banks accumulate capital and allocate it more effectively. By investing in a variety of assets, banks can spread their risk and generate more stable returns, which can be used to fund future growth and lending activities (13).

Asset liability management: Asset diversification is closely related to asset liability management, which is the process of managing the maturity and interest rate sensitivity of a bank's assets and liabilities. By diversifying their assets, banks can better match their assets and liabilities, reducing their interest rate risk and improving their liquidity (14).

Optimal diversification: The optimal level of diversification for banks is a topic of ongoing research and debate. Some studies suggest that banks should diversify their assets to the point where the expected return from diversification exceeds the cost of diversification (15). Others argue that banks should focus on their core lending activities and only diversify to the extent that it enhances their risk management and profitability (16).

Market structure and competition: The structure of the banking market and the level of competition can also influence the optimal level of diversification for banks. In markets with high levels of competition, banks may need to diversify more extensively to remain competitive and generate sufficient returns (17).

Regulatory framework: The regulatory framework can also impact the ability of banks to diversify their assets. Strict regulations may limit the types of assets that banks can invest in, or the extent to which they can diversify (18).

Innovation and technology: The increasing use of innovation and technology in banking sector, such as digital platforms and fintech, can also impact the diversification of bank assets. Banks may be able to diversify their assets more easily and efficiently through these channels, but they also present new risks and challenges (19).

Overall, the theoretical literature on bank asset diversification suggests that it can be a valuable strategy for improving risk management, capital accumulation, and profitability, but it also presents challenges and risks that must be carefully managed. The optimal level of diversification will depend on a range of factors, including the bank's business model, risk appetite, and the

market structure and regulatory environment in which it operates.

Empirical literatures

The impact of asset diversification on the performance of banks in various nations has been the subject of numerous studies. The findings vary from study to study and are shown in the following manner:

A study was conducted on the impact of investments on Ethiopian banks' performance. To examine the regression model and collect data from eight commercial banks over a period of eleven consecutive years, 2005-2015, the study used a balanced panel model. The **Fixed Effect** model was employed in the study. One dependent variable, ROE, was utilized in the study. Four independent variables, fixed asset investment, foreign deposit, equity investment, and NBE bill buying, were also employed. The results of the regression demonstrate that foreign deposits and fixed asset investments had a favorable and significant impact on bank performance. On the other hand, the acquisition of NBE Bills significantly and negatively impacted the effectiveness of commercial banks (20).

The relationship between bank profitability and portfolio diversification across several industries, larger economic sectors, and geographical areas is examined by Hayden *et al*. (16). They used a special data set of the individual bank loan portfolios of 983 German banks during the years 1996 to 2002 to investigate this problem. Overall data indicated that diversification does not significantly improve performance because each sort of diversification tends to lower banks' returns.

Using data from Turkey, Turkmen and Yigit (17) investigated banking diversification and its impact on banks' performance. The study examined data from 40 commercial banks. Return on Equity and Return on Assets were used to calculate profitability, while the Herfindahl Index was used to evaluate location diversification (HI). The study indicated that diversifying credit portfolios had an impact on banks' risk levels since losses in one area or one location were offset by gains in other areas or places.

Using a descriptive survey, a study conducted a study discovered through regression analysis showed that the loan portfolio has a direct impact on a bank's profitability (17). Eyerusalem (10) looked at how asset structure affected the financial performance of a few Ethiopian private commercial banks. In order to investigate the cause-and-effect relationship between an asset's components and its financial performance, this study used an explanatory research design. An empirical model was built using a quantitative method. Thirteen

private commercial banks provided secondary data for the years 2011-2017. Thirteen private commercial banks were chosen out of sixteen with a seven-year time frame to construct a constant panel and ensure the availability of complete data for those banks across the chosen time frame. According to the findings, cash holdings have a positive but hardly significant impact on financial performance, while fixed assets and deposits made with foreign banks have a positive and significant impact on financial performance.

Another study looked into how asset diversification affected the financial health of commercial banks. The research design for the study was descriptive. Secondary data were gathered from annual reports of commercial banks. The study was conducted during a five-year period, from 2011 to 2015. Inferential statistics were employed to analyze the quantitative data. The study's findings showed that all independent variables have a positive and significant impact on the financial performances of commercial banks. These independent variables include financial assets, loans, cash and cash equivalents, and other investments (22).

A study used data from the annual reports of 10 banks from 2007 to 2013 to analyze the impact of loan portfolio quality on bank performance. The study used STATA Statistical Software and the panel regression approach. The findings show that on the financial performance of the chosen banks, net interest margin has a favorable impact and loan loss provision has a negative impact (18). For a five-year period between 2011 and 2015, another study assessed the impact of commercial banks in loan portfolio on their financial performance. The study discovered that commercial banks' profitability was significantly negatively impacted by portfolio expansion in loans (8).

Conceptual framework of the study

After extensive literature review, the following conceptual framework (Figure 1) was developed.

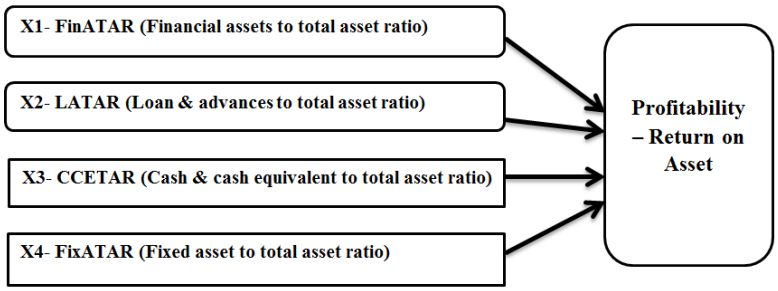

Figure 1: The conceptual framework of the study (**Source**: Own construction, 2022)

Materials and methods

The study identifies the cause and effect relationship of asset diversification and profitability; hence an explanatory research design and quantitative research approach were adopted. As of June 2020, Ethiopia had 19 licensed and operational commercial banks. Eight banks with at least ten years of data were chosen at random. A data sheet was used to help collect the data. As a result, panel data for the 8 sample banks for the years 2011 to 2020 was gathered from the sample banks audited financial statements. The panel regression model was utilized to look at the relationship between asset diversification and the profitability of the commercial banks.

Dependent Variable

The Return on Assets (RoA) is the dependent variable in this study. The ROA, which quantifies the profit made for every dollar of assets, shows how well bank management uses the institutions' actual investment resources to produce profits. Net income divided by total assets is how ROA is calculated. ROA is defined as net income divided by total assets.

Independent Variables

- **X1- FinATAR (Financial assets to total asset ratio)**

Financial assets include bank accounts, bonds, and stocks, whose worth is established by a legal claim to the thing they stand in for. This variable was calculated by dividing the financial assets by the total assets. The profitability of the banks will decrease as the percentage of financial assets in the portfolio increases. It is anticipated that this variable will have a negative impact on the dependent variable. This variable is continuous.

- **X2- LATAR (Loan and advances to total asset ratio)**

The majority of banks rely on their loan portfolio as both a valuable asset and a source of income. This variable was calculated by dividing the loans and advances by the total assets. The bigger the percentage of loans and advances in the

portfolio, the more profitable the banks will be. It was anticipated that this variable will have a favorable impact on the dependent variable. This variable is continuous.

- **X3- CCETAR (Cash and cash equivalent to total asset ratio)**

Bank drafts, demand deposits, checks, treasury bills, bonds, and deposits with the central bank are all examples of cash and cash equivalent. This variable was calculated by dividing the cash and cash equivalents by the total asset. The profitability of the banks will decrease as the percentage of financial assets in the portfolio increases. It is anticipated that this variable will have a negative impact on the dependent variable. This variable is continuous.

- **X4- FixATAR (Fixed asset to total asset ratio)**

Increased productivity and long-term success can be achieved by investing in fixed assets such as land, buildings, plant and machinery, fixtures, fittings, and motor vehicles. This variable was calculated by dividing the fixed asset by the total assets. The profitability of the banks will decrease as the percentage of financial assets in the portfolio increases. It is anticipated that this variable will have a negative impact on the dependent variable. This variable is continuous.

The following regression model was used to establish the relationship among the study variables

$Y= \beta0+ \beta1\ X1 + \beta2\ X2 + \beta3\ X3 + \beta4\ X4 + \varepsilon$

Whereby;

- Y = Profitability of banks measured by Return on Asset
- X1- FinATAR (Financial assets to total asset ratio)
- X2- LATAR (Loan and advances to total asset ratio)
- X3- CCETAR (Cash and cash equivalent to total asset ratio)
- X4- FixATAR (Fixed asset to total asset ratio)
- $\beta0$ = regression constant
- $\beta1$, $\beta2$, $\beta3$ and $\beta4$ = coefficients associated with predictor variables
- ε = Residual (error) term

Data analysis & interpretation

Diagnosis tests

- **Assumption one: the errors have zero mean (E (ε) = 0)**

The first regression assumption required that the average value of the errors is zero (E (ε) = 0). The aforementioned assumption will not be violated if a constant term is included in the regression equation. The regression model used in this study included a constant variable. Hence, this assumption was not violated.

Assumption two: Test for Heteroscedasticity

The Breusch-Pagan is the one of the most popular method to detect Heteroscedasticity. In this study, Breusch pagan test was utilized to detect the existence of heteroscedasticity and is presented below (Table 1). Since the P-value mentioned in the table above is greater than 0.05, we can say that there is no problem of heteroscedasticity. This indicates that the assumptions of homoscedasticity was not violated

Table 1: The Breusch-Pagan/Cook-Weisberg test

Ho: Constant variance Variables: fitted values of ROA
Chi2 (1) = 0.10
Prob > Chi2 = 0.7520

Assumption three: Test for normality

The data is normal if Shapiro-Wilk Test value is greater than 0.05. In case of this study, as shown below (Table 2), the p-value of Shapiro-Wilk test is more than 0.05. Hence, we can say that normality assumption is not violated.

Table 2. The Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
RoA	80	0.97998	1.374	0.696	0.24315

Assumption four: Test for Autocorrelation

The Durbin-Watson statistic is one measure commonly used to test for autocorrelation. The general rule is that if autocorrelation is present, the value for the Durbin-Watson statistic will be close to 0 or 4. For this study, the Durbin-Watson statistic equals nearer to 2, which is 1.41, so we can feel confident that the autocorrelation is not a problem with our data.

Assumption five: Multicollinearity test

Pearson Correlation matrix between independent variables is calculated to check the existence of multicollinearity. Accordingly, the following data (Table 3) showed that there is no correlation coefficient that exceeds the threshold of 0.90. Hence, in this study there is no problem of multicollinearity.

Table 3. The results of Multicollinearity test

	FinATAR	CCETAR	LATAR	FixATAR
FinATAR	1			
CCETAR	0.537	1		
LATAR	0.809	0.618	1	
FixATAR	0.598	0.273	.699**	1

Choosing between Random and Fixed effects models

There are two types of panel data models that are frequently used. The two different kinds of panel data models are the random effect (RE) model and the fixed effect (FE) model. In order to demonstrate the causal relationship between the independent and dependent variables in this study, it is necessary to select one model that produces consistent estimates. The Hausman specification test is used to achieve this. The Hausman test's final result indicates that the figure of prob>chi2 = 0.4645 is more than 0.05, necessitating the employment of the random effect technique.

Regression output and interpretation

The diagnostic tests were made and the right model was also identified. Now, the regression can be run. The linear regression, which evaluates the model's significance, showed that the regression model substantially predicts the outcome variable with a p-value of (0.000), indicating that the overall model used was sufficiently accurate to predict the outcome variable (Table 4). It demonstrates that the independent factors satisfactorily account for 69.50 percent of the dependent variable (RoA). The selected independent variables combined significantly explain the dependent variable.

Table 4. The Regression result of the model used in the study

```
Random-effects GLS regression                   Number of obs      =        80
Group variable: banks                           Number of groups   =         8

R-sq:  within  = 0.8349                         Obs per group: min =        10
       between = 0.1375                                        avg =      10.0
       overall = 0.6950                                        max =        10

                                                Wald chi2(4)       =    187.07
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

RoA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
FinATAR	-.068409	.0103084	-6.64	0.000	-.0886132	-.0482049
CCETAR	-.1029032	.0112824	-9.12	0.000	-.1250164	-.08079
LATAR	.0200145	.0105788	1.89	0.058	-.0007196	.0407485
FixATAR	-.0808194	.0500707	-1.61	0.107	-.1789563	.0173174
_cons	.0788696	.0089428	8.82	0.000	.0613421	.0963971
sigma_u	.00048456					
sigma_e	.00350289					
rho	.01877599	(fraction of variance due to u_i)				

Financial asset: The results indicate that this variable has negative and significant influence on ROA. The RoA will change by 0.06% for every 1% change in a bank's financial asset (increase or decrease), assuming all other factors remain constant. This outcome demonstrates that the profitability of the Ethiopian banking sector is negatively impacted by a rise in the volume of financial assets which is consistent with literature reports (8).

Cash and cash equivalents: A unit increase in the diversification to cash and cash equivalents would result in a factor of 0.10 reductions in the profitability (ROA) of banks. Negative consequences of holding too much cash include the possibility of losing money due to fund costs, while holding too little cash results in a lack of operating funds. To earn returns, these extra funds must be invested elsewhere. According to the identical conclusion reached by Yahaya et al. (22), Cash and bank balances have a detrimental impact on the financial performance of Nigerian deposit money institutions.

Loan and advance: the study showed a statistically significant and positive impact on profitability at a 10% level of significance and a coefficient of 0.02. This implies that increasing a bank's loan and advance portfolio will increase its

profitability. The results support assertion that loans are among the most important and valuable forms of assets maintained by banks because they are the basic source of such income. Additionally, the results were in line with other researchers (14,19).

Fixed asset: Even though it was not statistically significant, a unit change (increase or reduction) in fixed asset diversification would cause a factor of 0.08 opposite direction in the bank's profitability (ROA), holding all other independent variables constant. Likewise, Olatunji and Adegbite (18) stated that the study's findings showed that fixed asset investments have a negative and significant impact on the performance of the chosen banks.

Conclusion

For commercial banks, revenue mostly comes from the interest earned on loans and advances. Bank profitability increases as more deposits are converted into loans because loan interest rates are higher than deposit interest costs. As a result, the sample banks' ratio of loans to total assets during the study period demonstrates a favorable and very significant impact on bank profitability. Because the majority of bank revenue is generated from these assets, the researcher advises bank managers and bank policy makers to focus more on diversifying their loan and advance asset portfolios.

- The financial asset has a negative coefficient and a big impact on profits, hence, bank managers should focus on how to diversify their financial asset.
- The profitability was significantly impacted by the negative coefficient of cash and cash equivalents. So, the managers of the banks should concentrate on diversifying their cash and cash equivalent. A surplus of idle cash could result in losses due to the cost of interest paid to the depositor.

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Data availability

Data is not available for online access. However, readers who wish to gain access to the data can write to the corresponding author.

Conflict of interest

The authors declared no conflicts of interest exist.

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