

Nexus Between Operational Efficiency and Profitability from Tanzanian Listed Commercial Banks at Dar es Salaam Stock Exchange

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ABSTRACT

The profitability of any commercial bank is very essential and can be determined by operational efficiency. The aim of this paper is to assess the connection between operational efficiency and profitability from Tanzanian listed commercial banks at Dar es Salaam Stock Exchange (DSE). Efficiency Structure Hypothesis was used in this study. A quantitative research approach adopted in this research, cross sectional research design was used in this study, was applied in the study. The sample size of the study includes 70 observations in total from population of 7 listed commercial banks at DSE between 2014 and 2023 (Annual data). Data extracted from the reliable source DSE. Data for the paper was collected through documentary review from various financial statement reports. Random sampling procedure was opted in this study. The data from the study were analyzed using panel data regression. The findings indicated that there is a statistical significance between commercial banks' profitability and operational efficiency from Tanzanian listed commercial banks at DSE ($P\text{-value} = 0.672 > 0.05$). The study concluded that operational efficiency has an impact on the bank profit of Tanzanian listed commercial banks at DSE. This applied that the banks should maintain their profitability while running at low cost. The study recommended that Tanzanian listed commercial banks at DSE must preserve their operational efficiency in order to save the operational expenses so as to boost the bank profit.

Keywords: Commercial Banks, Operational Efficiency, Profitability, Tanzania

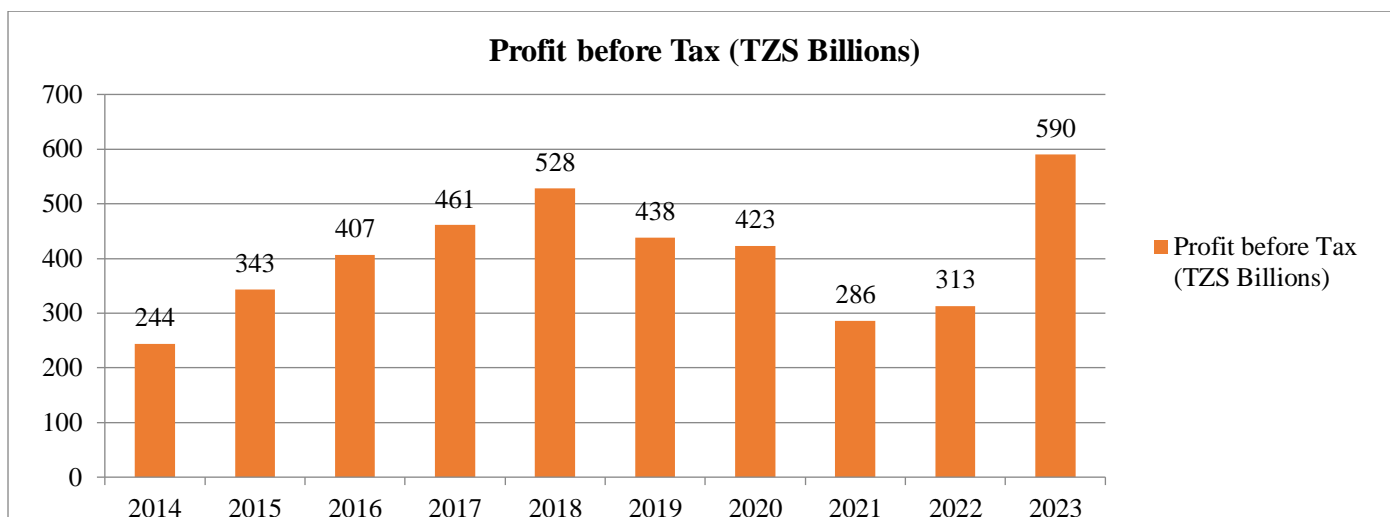
I. INTRODUCTION

Tanzania like other countries that raise capital through capital market. The economic growth of any country depends on banking industry. So operational efficiency is required to receive profitability for commercial banks (Dao, 2020). Commercial banks listed at capital market in order to boost the capital and hence retaining of profit (Achi, 2023). Poor operational efficiency may affect the bank profitability in developing countries and developed countries (Al-Homaidi et al., 2020).

Globally, the banking sector acts as crucial component of the economy of any country, especially in facilitating financial inclusion which in turn fosters the economic development of a country (Achi, 2023). Al-Homaidi et al., (2020), added that the economy progress of any country highly relies on banking sectors due to their crucial role, including safekeeping of depositor's money. The main function of the banking industry is to channel funds from those with excess to those with deficit; this in turn theaters an important function in the distribution of resources within a nation for economic development. Apart from playing a significant role by making sure funds are available for investors in any country, commercial banks also enhance the financial sector growth in any country (Dao, 2020). Apart from the usual role of intermediation of commercial banks, the financial performance is also guaranteed by commercial banks, which is a reward to the stakeholders and ultimately stimulates the over-all country's economic growth (Dao, 2020).

The importance of the financial sectors has also been highlighted for developing nations, including several African nations; in these nations, commercial banks are important sources of capital and a convenient source of funding for businesses. Considering its significance, the banking industry needs to operate well in order to support developing nations' economic growth. Therefore, improved bank performance as determined by effectiveness is essential for the economy, stakeholders, clients, and banks themselves to continue operating and growing (Ngumo et al, 2020).

Tanzania boasts a sizable banking industry; financial reforms led to the establishment of the nation's commercial banks. Significant changes were observed in the country's commercial banks following the liberalization of the financial system in 1991 (Ahmad et al., 2020). The modifications were made with the intention of improving the country's financial system by removing barriers to banks entering the market. The creation of more banks around the country increased competition, which in turn led to an improvement in the productivity of commercial banks (Budianto & Dewi, 2023). On the other hand, macroeconomic factors are irrelevant to bank profitability. The profitability trend of Tanzania's banking industry is shown in Figure 1.

**Figure 1**

Profitability Trend of the Tanzanian Banking Industry

Source: BOT (2014-2023)

1.1 Statement of the Problem

According to Yakubu and Musa (2024), commercial banks performance indicators can be subdivided into two groups which are external (macroeconomic factors) and internal (bank specific factors). The exterior factors include those which affect the whole sector or country, and therefore beyond the control of the bank (Shahzad et al., 2023). Numerous scholars have tried to expound on causes of banks' productivity within and out of the country borders. However, there has been mixed findings on how banks internal factors affect the productivity of commercial banks. While researchers such as Rahman (2023), in Bangladesh, Widyatmoko and Risman, (2024), in Sri-Lanka, Yakubu and Musa, (2024), in New Zealand, Zhu and Jin (2023) in Tanzania opine that there is a significant constructive liaison amongst internal features of operational efficiency; others such Rajindra et al., (2021) in Nigeria, in Philippines opined that specific attributes (internal) of the banks negatively affect their profitability.

Reviewing studies has shown that internal issues do affect the performance and bank profit of listed commercial banks in a number of countries, including Tanzania. Studies exist, but none of them examined variables collectively, such as the profitability and operational effectiveness of Tanzanian commercial banks. Our research therefore sought to bridge the information gap.

1.2 Research Objectives

- i. To determine the relationship between bank revenue and Profitability from Tanzanian Listed Commercial Banks at Dar es Salaam Stock Exchange
- ii. To determine the relationship between bank expenses and Profitability from Tanzanian Listed Commercial Banks at Dar es Salaam Stock Exchange

1.3 Research Hypothesis

The research hypothesis between variables are illustrated as follows;

H_{01} : There is no relationship between bank revenue and profitability from Tanzanian listed commercial banks at DSE.

H_{02} : There is no relationship between bank expenses and profitability from Tanzanian listed commercial banks at DSE.

II. LITERATURE REVIEW

2.1 Theoretical Review

This section covers the theory that pinning their study.

2.1.1 Efficiency Structure Hypothesis

Nonetheless, the study's compass was Kepramareni et al. (2022), Efficiency Structure Hypothesis (ESH). According to the argument, banks actually reduce operating costs because they run their businesses more efficiently than their competitors (Rajindra et al., 2023). This suggested the less money banks had to spend operating their businesses, the more money they would make. Furthermore, it has been suggested that there is a connection between a

profitability and operational efficiency (Rajindra et al., 2023). This is true because increased bank efficiency results in lower operating costs and higher bank profitability.

According to Kepramareni et al. (2022), companies who do well will be able to provide cheaper pricing and gain greater market share. This will increase sales and earnings. The Efficiency Structure Hypothesis (ESH) was used to show how operational efficiency impacts Tanzanian commercial banks' profitability, and these theoretical justifications helped to validate the hypothesis.

2.2 Empirical Review

This section discusses the previous studies similarly to this study.

2.2.1 Relationship between bank revenue and Profitability

Shahzad et al., (2023), conducted study on the determinant affecting the performance of Kenyan microfinance institutions in 2024. A five-year timeframe was used to study seven (7) microfinance banks and collect data from 2011 to 2015. Data analysis was done using descriptive analysis. Comparing these banks' performance to that of microfinance companies, the research discovered a favorable and positive, substantial relationship between their profitability and operational efficiency.

The 2024 study by Widyatmoko and Risman looked at how corporate governance and defaulters risk management affected the bank profit of Indonesian banks. The paper took into account 27 banks that were listed on the ISE between 2011 and 2015. The study used credit and operational risk as well as financial performance as independent factors. The study's findings showed that operational risk acts as a positive facilitating factor in the association between corporate governance and banking financial performance.

2.2.2 Relationship between bank expenses and profitability

In contrast, Zhu and Jin (2023) studied the effects of total costs and income on commercial banks' profitability in Malaysia. Employing panel data analysis, the paper looked at the financial statements of 12 banks during a 10-year, from 2012 to 2022. The research independent variables were revenue and total expenses. The dependent variables that were utilized to determine profitability were ROE and ROA. Multiple regression analysis demonstrated that operational efficiency has an important influence on ROE and ROA.

Ngumo (2020) investigated the connection between deposit-taking microfinance organizations' financial performance and their low transaction costs (operational efficiency). The study's findings show a substantial and statistically important correlation between lower transaction costs and improved financial performance.

2.3 Conceptual Framework

The efficiency structure hypothesis, the literature analysis, and the explicit purpose of the research remained the basis for developing the conceptual model that has been used to investigate the profitability and operating fitness of Tanzanian commercial banks. The conceptual framework illustrated in Figure 2.

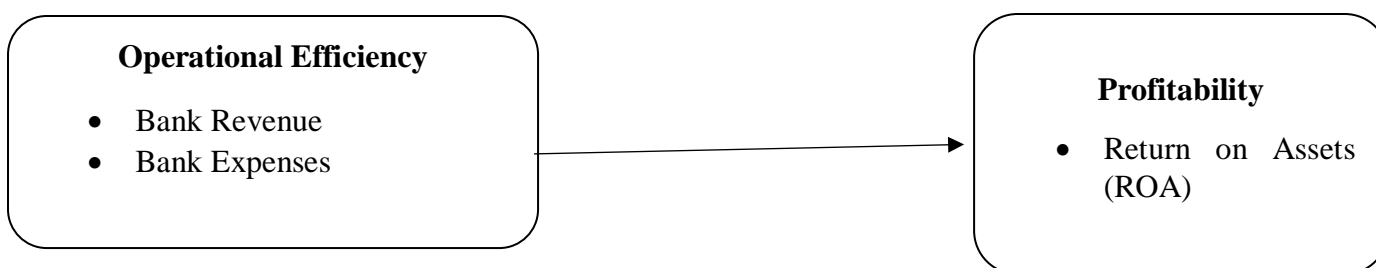


Figure 2

Conceptual Framework

Source: Literature Review, Ngumo (2020) 2024

III. METHODOLOGY

3.1 Study Area

The commercial banks involved in this research are DCB, CRDB, NMB, Mkombozi Commercial Banks, Mwalimu Commercial Bank, Maendeleo Bank and Mucoba bank.



3.2 Research Design

A quantitative research approach adopted in this research. Cross sectional research design was used in this study. This design is suitable for comparison of the entities or different groups.

3.3 Target Population and Sample Size

The research includes 70 observations in total from 7 commercial banks between 2014 and 2023

3.4 Data Analysis

Data for the research was composed through documentary review. The data from the study were analyzed using panel data regression. Data extracted from the trustworthy source - DSE.

3.1 Model Specification

Using the Random Effect Model (panel regression), both descriptive and inferential statistics were utilized to determine the link between the dependent variable (commercial banks' profitability) and the independent variables (bank expenses and bankrevenue). The random effect model that follows was used.

$$ROA_{it} = \beta_0 + \beta_1TE_{it} + \beta_2R_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Where:

ROA_{it} = Commercial Banks` Profitability

β_0 = Beta note

TE_{it} = Bank Expenses

R_{it} = Bank Revenue

ε_{it} = Stochastic term related with firms and period

μ_i = Stochastic term related with firms

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics of the Variables

In a determination to control the standard deviation, mean, maximum and minimum for the time below research, percentages for both response and explanatory variables remained collected from the bank reports of the selected organizations. The natural logarithm method was employed to standardize the fractions, in purpose to reduce the enormous differences. The overall costs for the chosen banks were consistent between 2014 and 2023, with an average of 4.52, a maximum of 15.79, a minimum of 2.18, and a standard deviation of 0.29751, according to the descriptive data. The research findings are inside the projected series because it included the top 10 banks according to asset valuation.

The average Bank Expenses (BE) ratio of the chosen banks was 2.18 to 4.52, with a 2.18 minimum. The minimum standard deviation of 0.29751 indicated that there was slight difference in the overall costs for the chosen banks during the course of the investigation. A similar pattern could be seen in bank revenue (BR), which varied just little from the mean (4.2775) at 4.01% and 4.59%. The selected institutions' operational efficiency status remained constant throughout the inquiry, as indicated by the standard deviation of 0.10478.

Table 1
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Bank Expenses	70	2.18	4.52	2.6847	0.29751
Bank Revenue	70	4.01	4.59	4.2775	0.10478
ROA	70	-4.61	1.56	0.6165	0.88925

4.2 Correlation Analysis

The findings of the association investigation also exposed that there is a positive relationship but a negative connection between total expenses and revenue (-0.513), ROA (0.738), and total expenses (0.000). This implies that when total expenses and ROA increase together with a decrease in bank revenue.



Table 2
Correlation Analysis

		Bank Expenses	Bank Revenue	ROA
Bank Expenses	Pearson Correlation	1		
	Sig. (2-tailed)	-0.000		
Bank Revenue	Pearson Correlation	-.513**	1	
	Sig. (2-tailed)	0.000		
	Sig. (2-tailed)	0.903	0.574	
ROA	Pearson Correlation	-0.038	0.041	1
	Sig. (2-tailed)	0.752	0.738	

4.3 Multicollinearity Test

When independent variables exhibit significant correlations with one another, they can impair the accuracy of regression analysis results in the model and make the results challenging to comprehend. This phenomenon is known as multicollinearity. Multicollinearity was characterized by Zhu and Jin (2023), as a situation in which there is an approximately linear relationship between the explanatory variables. Using the VIF, operational efficiency, one of the related independent variables, was examined to see how much it could skew the results.

Table 3
Multicollinearity Statistics

Variable	Collinearity Statistics	
	Tolerance	VIF
Total Expenses	0.883	9
Revenue	0.731	10

The three independent variables (revenue, total expenses, and revenue), as indicted in Table 3 above, all had VIF values more than 9. The VIF value of revenue was 15, while the value of all expenses was 10. Both independent variables were included in the multiple regression analysis, since their VIF values were less than 10.

4.4 Test for Autocorrelation

Panel data regression presumptions that are permanently employed before the panel data analysis are autocorrelation, since panel data regression involves an annually and this subject classically ascends in data with a huge period (longitudinal data).

Table 4
Serial Autocorrelation Test

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F (1, 5) = 0.892
Prob > F = 0.462

The Wooldridge autocorrelation test results, which are intended to assess the viability of the theory that there is no autocorrelation in panel regression, are shown in Table 4. In this examination, there are frequently two theories: The another theory opposes that autocorrelation occurs in the classical, in difference to the H₀, which declares that it organizes not. Table 4 exhibits that the panel regression assumption of no autocorrelation is convinced by a P-value of more than 0.05.

4.5 Unit Root / Stationarity

It is usually recommended to do a panel unit root test before utilizing panel regression to avoid spurious regression, especially once the period panel data extents more than 5 years. Table 5 explains the findings of the panel unit root test that was employed to ascertain whether the data are steady.



Table 5
Panel Unit Root Tests for the Variables at Level

Variable	Statistic	p-value
ROA		
Unadjusted t	-6.329	0.000
Adjusted t*	-4.023	
Bank Expenses		
Unadjusted t	-19.365	
Adjusted t*	-20.031	0.000
Bank Revenue		
Unadjusted t	-8.227	
Adjusted t*	-6.789	0.000

It tests the following hypothesis

Ho: Panels cover unit roots

Ha: Panels are inactive

Table 5 shows the result of the panel unit root that was employed to stop false regression. Since every variable used in the examination had p-values greater than the 5 % significant level, the results shown in Table 5 show that no variable in the research is non-stationary.

4.6 Lagrangian Multiplier Test for Random Effect

Prior to using a pooled ordinary least square regression, fixed effect, or random effect model, the Lagrangian multiplier test for random effect should be run to ascertain whether there is a random effect in panel data. If a random effect is present, one of two models is used to evaluate the effect of the explanatory variable on the response variable: a fixed effect model or a random effect model.

Table 6
Breusch and Pagan Lagrangian Multiplier test for Random Effects

Estimated results:	Var	sd
ROA	0.791	0.889
E	0.500	0.707
U	1.251	1.501
Var(u)=0		
Test:	chibar2(01) =	253.820
	Prob>chibar2=	0.005

The results of random effects for Breusch and Pagan's Lagrangian multiplier test are exhibited in Table 6. The existence of variance among entities is ascertained using the LM test. This implies that the units are not appreciably different from one another and that there is no panel influence. Since the P-value (0.000) was less than 0.05, Table 6's data show that the H0 was accepted and the H1 was rejected. Opposite, the panel effect is real. For banks listed on the DSE panel models (fixed effect or random effect) are additional valuable than pooled regression analysis for scrutinizing the association between Operating efficiency and ROA.

Table 7
Hausman Specification Test

Variable	Coefficient		Difference b-B	standard error sqrt(diag(V_b-V_B)) S.E.
	B Fixed	B random		
Bank Expenses	-0.343	-0.161	-0.182	0.126
Bank Revenue	-0.615	-0.581	-0.034	0.204
Chi ² test value	4.22			
P-value	0.88			



The Hausman test results, which assessed which of the fixed and random effect models was more suitable to define how operating efficiency affected return on asset, are shown in Table 7. Endogeneity in the panel regression analysis is reliably detected by the Hausman test. Table 7 shows that the test's p-value (p-value = 0.672) > 0.05, indicating that there was no endogeneity effect in the model. This is why it makes sense to utilize the random effect model to calculate the operating efficiency on return on assets.

4.7 Random Effect Model

The Hausman test results, which assessed which of the fixed and random effect models was more suitable to define how operating efficiency affected return on assets, are shown in Table 7. Endogeneity in the panel regression analysis is reliably detected by the Hausman test. Table 7 shows that the test's p-value (p-value = 0.672) > 0.05, indicating that there was no endogeneity effect in the model. This is why it makes sense to utilize the random effect model to calculate the operating efficiency in return on assets.

Table 8

Random Effect Model

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Bank Expenses	-0.161	0.084	-1.910	0.056	-0.327	0.004	*
Bank Revenue	-0.581	1.239	-0.470	0.639	-3.010	1.849	
Constant	10.924	5.566	1.960	0.050	0.015	21.833	**
Average explanatory var	0.616		SD explanatory var		0.889		
Cumulative R ²	0.365		N		80.555		
Chi-square	72.33		Prob > chi2		0.005		
R ² within	0.344		R2 between		0.752		

*** $p < .01$, ** $p < .05$, * $p < .1$

The research goal of the research was to assess how operational efficiency influences the bank profit of selected listed commercial banks in Tanzania at DSE. The objective of the paper was to govern how operational efficiency influences the profitability of commercial banks by reviewing data from document evaluations of seven listed commercial banks at DSE.

The study's conclusions are consistent with Achi's (2023) comparison of operational efficiency to Kenyan microfinance firms' performance. Their study originates a strong and statistically important connection between financial success and operational efficiency. Rajindra et al. (2023) asserted a statistically significant and positive correlation between low transaction costs and financial success, and they also examine the impact of low operational efficiency on the profitability of credit-taking microfinance enterprises. Furthermore, Kepramareni et al. (2022) study from Malaysia in 2022 discovered that operational efficiency significantly affects ROA and ROE. Furthermore, an Indonesian study conducted by Kweh et al. in (2024) discovered that operational risk acts as a positive mediator between the impact of composition of boards and banking profitability.

The study's findings regarding the bank revenue and bank expenses demonstrated a connection to the signaling theory, since operational effectiveness significantly increased the profitability of Tanzania's commercial banks. According to the hypothesis, prudent management choices serve as a positive indicator of a bank's worth to the competition. This implies that a bank is more probable to invest more funds in the company and raise capital when excellent internal management decisions are made (Widyatmoko and Risman, 2024; Ngumo, 2020). Therefore, one component of effective management that is likely to have an impact on the bank's success is operational efficiency. In light of the research findings, it has been noted that sound management choices made inside a bank's internal control system lead to higher operational efficiency, which in turn raises the profitability of Tanzania's commercial banks. As a result, it can be claimed that signaling theory directly relates to the research findings on the effect of operational efficiency on the profitability of commercial banks, given that the former is largely determined by wise bank management choices.

Conversely, the results of Ahmad *et al.*, (2020), stated that the Efficiency Structure Hypothesis (ESH) implies that the bank may have lower operating expenses as a result of running more profitably than its rivals (Ahmad et al., 2020). This suggested that banks' operating expenses may be reduced, which would raise their profitability. Additionally, it was proposed that a bank's efficiency and profitability are positively correlated (Zhu and Jin, 2023). This is so because when bank efficiency rises, operating expenses fall and bank profitability rises as a consequence. This holds true for this study as well, because it has been noted that operational effectiveness has an impact on commercial banks' profitability.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

The profitability of commercial banks was negatively but statistically significantly impacted by operating efficiency. This suggested that commercial banks have a higher chance of experiencing losses when their activities are poorly managed.

5.2 Recommendations

The study makes the following recommendation: in order to make lower expenses and boost profits, commercial banks should operate more efficiently. Nevertheless, commercial banks will experience losses if their operating expenses are high. Thus, it is advised that other research examine additional variables, such as macroeconomic issues (money supply, interest rates, and inflation, among others).

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