Analyzing the Impact of Internet Banking on Profitability in the Indonesian Banking Sector

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A R T I C L E   I N F O

A B S T R A C T

This research aims to identify variables that influence profitability in banking companies listed on the Indonesian Stock Exchange. The addition of the bank capital variable as an independent variable is a novel part of this research. This research method involves collecting data from 20 banking companies over a six-year period (2018–2023) with a total of 120 data that meet the criteria by applying data processing analysis using panel data regression analysis techniques. The research results found that internet banking had a significant positive impact on return on assets, while operational performance and credit risk had a significant positive impact on bank performance. Bank capital also has a significant negative effect on return on equity. Apart from that, spread and intermediation costs have no effect on bank performance. The implication for financial managers is to provide guidance for financial managers to optimize the use of operational performance, paying attention to credit risk to increase bank profitability. Financial managers also need to be proactive in developing strategies, facing challenges, and adapting to technological developments in utilizing internet banking to ensure the bank's success in the digital era. Then investors need to consider the potential profits and risks associated with credit risk because it can disrupt performance in the banking sector, as well as carry out fundamental analysis and portfolio diversification to minimize risk. Investors also need to look at bank operations by paying attention to improving bank operational performance because this can increase bank income from various types of services, such as transaction fees, deposit interest and loan fees.

1. INTRODUCTION

The banking sector, which is at the forefront of digital transformation, recognizes the importance of leveraging the latest information and communication technologies. The emergence of fintech (financial technology) has introduced innovative technologies such as blockchain, artificial intelligence, and cloud technology, which contribute to increased efficiency that is incomparable to that provided by traditional processes. The ever-growing evolution of "fintech" is very important for Islamic and conventional finance, requiring its active influence in the ongoing digital transformation (Sayari, 2024).

Internet banking refers to a set of financial services delivered through digital channels. In essence, this allows customers to access and use financial services via mobile phones, computers, Point-of-Sale (POS) terminals, and Automated Teller Machines (ATMs) (Hakizimana & Muathe, 2023). According to Grubišić and Kamenkovic (2022) to electronic payments, individuals can easily transfer funds, settle bills, and make purchases from the comfort of their home or while shopping with minimal physical interaction. Internet banking facilitates a fast and safe method for governments to reach vulnerable groups through social transfers and other financial assistance packages, especially during periods of limited mobility or unsafe travel conditions. Connection between Internet banking and profitability bank explored in a way wide in literature debate relevance Digital Insights (IN) through application Internet banking, with mention a number of benefits for customers (Sayari, 2024).

Investigating the relationship between fintech and traditional financial institutions has attracted many researchers. For example, fintech plays an important role in finance (Mantik & Chandra, 2021). The banking industry is being shaped by the development of fintech, which has significantly impacted the development of bank credit (Isenberg, Sazu, & Jahan, 2022). On the other hand, fintech has a negative impact on bank performance (Sayari, 2024). As a result, the influence of fintech on banks is still a matter of debate,

so more empirical research is needed to examine the relationship between fintech and bank performance (Pham, Tran, Huynh, Popesko, & Hoang, 2024).

Different phenomena and research gaps, this research will focus on examining "factors that influence profitability in the Indonesian banking sector". This research adds a new variable, namely the bank capital variable, with reference to previous researchers finding results that capital factors have a positive effect on bank performance (Pham et al, 2024). This research makes a significant contribution to understanding the dynamics of the banking industry, especially in terms of the impact of internet banking on bank profitability. This research extends previous theoretical discussions by building a regression model through panel data analysis, utilizing key metrics such as Return on Equity (ROE) and Return on Assets (ROA) to quantitatively assess the impact of internet banking on bank profitability (Isenberg et al., 2022).

Bank Performance

Bank Performance is an activity carried out by banks to see how effective a bank is in making profits in a certain time (Alamsyah & Mn, 2022). In managing their business, banks must analyze their financial performance, because they can analyze or know their current financial condition and can see or determine future business policies (Pertiwi et al., 2023). This research provides important insights into how internet banking affects bank profitability, as measured by ROA and ROE metrics (Sayari, 2024).

Internet Banking

Banks that adopt internet banking services will be more effective and efficient in serving their customers (Ayuningtyas & Sufina, 2023). Because internet banking is a service that can be accessed by customers to carry out banking activities via the internet network (Sayari, 2024). Therefore, it can be said that the purpose of applying internet banking is to provide better services which will have an impact on the performance of the banking itself. So, in other words internet banking will improve banking performance (Torki, Razaei & Razmi, 2020).

Spreads

The interest rate is always a measure for people in determining their preferences between saving or investing the funds they have (Musah, Anokye, & Gakpetor, 2018). The credit interest rate is always greater than the savings interest rate, usually called the interest rate spread. This interest difference is the main income of banking companies (Were & Wambua., 2014). Net interest income is obtained from interest received from loans provided minus interest costs from sources of funds provided. Increased interest income can contribute to bank profits. So it can be concluded that the greater the interest rate spread of a bank, the greater the bank's profitability, which means that financial performance will increase (Rori, Karamoy, & Gamaliel, 2017).

Non-Performing Loans (NPL)

Non-Performing Loan is a description of the condition of the debtor being unable to pay the installment obligations that have been determined at the beginning or NPL can be interpreted as banking activity regarding its credit activity (Lidiawan, Djunaedi, Sulasihningsi & Cahyani, 2022). The credit in question is current credit, doubtful credit and bad credit. It can be said that the better the banking performance, the smaller the NPL ratio level and vice versa, because the smaller the NPL generated by the bank, which means the credit risk borne by the bank is smaller and vice versa (Akter & Roy, 2017).

Operational Performance

Operational performance describes the idea of increasing competitiveness and increasing interest in investors or customers in a bank (Sayari, 2024). In the banking performance literature, operational performance is used to assess managerial efficiency in banks. This will be determined by dividing total operational costs by total income, if the operational performance results are high, indicating that the company funds operations with a large amount of money or with high accounts payable (Sporta, Ngugi, Ngumi & Nanjala, 2017).

Intermediation Costs

Intermediation costs are the overall coverage of costs associated with the financial intermediation process, which provides insight into the operational costs incurred by banks (Tharu & Shrestha, 2019). When banks want to carry out intermediation, employees are the liaison for the intermediation. Banks incur costs for employees as implementers of intermediation, so that's when banks have to coordinate so that employees can maximize their performance and get a big effect from the intermediation carried out by these

employees and not increase the costs incurred (Affandy & Arinta, 2022). A low IC value indicates greater cost efficiency in intermediation activities, thereby increasing profitability efficiency and competitiveness in the banking sector (Sayari, 2024).

Credit Risk

Credit plays an important role in the main source of income in conventional and sharia banks (Abbas, Iqbal & Aziz, 2019). Credit risk evaluation is important for banks because it affects the financial performance, existence and development of the bank. This variable describes a bank's credit activities and assesses its risk of potential losses in its loan portfolio, in this case providing insight into risk management practices (Sayari, 2024).

Capital Bank

The high level of bank capital increases public confidence and trust in the health of the bank. Stronger banks can channel available funds into business activities and earn high profits (Abbas et al., 2019). This theory states that bank capital is one of the main determining factors for increases and decreases in profitability. This theory also states that bank capital increases bank returns at the start and up to the trade-off level; which means one of them causes a decrease in profits (Pham et al., 2024).

Conceptual Framework

The research results Ayuningtyas and Sufina (2023)state that internet banking has a significant positive effect on banking performance. Based on research conducted by Were and Wambua (2014) spread has a positive effect on banking financial performance in Kenya. Research developed by Musah et al. (2018), the results of which spread have a significant positive effect on bank profitability in Ghana. Sayari (2024)'s research results NPL has a positive effect on profitability. According to Grubišić et al (2022) operational efficiency has a positive influence on bank performance in Kenya. The results of this study are in line with research Indriasari et al. (2019) operational efficiency has a positive influence on company performance in India. The results of Sayari (2024)'s research state that a bank's intermediation costs have a positive effect on bank performance. According to research by Daniul, Mesbaul and Sakila (2022), there is a positive influence between credit risk on the financial performance of commercial banks in America and Europe. Furthermore, Pham et al. (2024) bank capital provides significant positive results on ROA. These results are also supported by research (Bata et al., 2021). Based on the relationship between the variables that have been stated, the conceptual framework in the research can be described as follows:
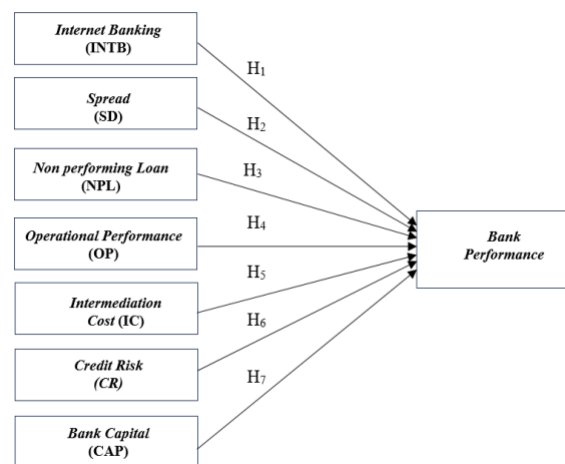

Figure 1. Conceptual Framework Chart

Hypothesis Development

Influence of Internet Banking to Bank Performance

According to Ayuningtyas and Sufina (2023), *internet banking* has a significant positive effect on banking performance. The results of this research are supported by Torki et al. (2019) who state that *Internet Banking* has a positive effect on bank financial performance. This is in line with research conducted by Sakanto and David (2019), namely that it has a significant positive effect on bank performance. Based on this explanation, the following hypothesis was developed:

H_1: Internet banking has a positive influence on bank performance

Influence of Spread to Bank Performance

Based on research conducted by Were and Wambua (2014), the spread has a positive effect on the financial performance of banks in Kenya, which means it has an important role in determining whether Kenyan banks play an important role in the banking sector. research developed by Musah et al. (2018) shows that spread has a significant positive effect on bank profitability in Ghana. Supported by research by Sayari (2024), spreads have a positive influence on banking financial performance. Based on this explanation, the following hypothesis was developed:

H_2: Spread have a positive influence on bank performance

Influence of Non-Performing Loan to Bank Performance

Based on research by Saleh and Paz (2023), NPL has a positive effect on bank performance because there are several factors that influence profitability, one of which is NPL. According to Sayari (2024) NPL has a positive effect on profitability. This research is supported by Akter and Roy (2017b) showing a significant positive effect on bank profitability. Based on this explanation, the following hypothesis was developed:

H_3: Non-performing loans have a positive influence on bank performance

Influence of Operational Performance to Bank Performance

The research results of Sayari (2024) show that operational performance has a significant positive correlation with bank performance. Meanwhile, the results of research conducted by Sporta et al. (2017) show that operational efficiency has a positive influence on bank performance in Kenya. The results of this research are in line with research by Giil et al. (2014) that operational efficiency has a positive influence on company performance in India. Based on this explanation, the following hypothesis was developed:

H_4: Operational performance has a positive influence on bank performance

Influence of Intermediation Costs to Bank Performance

Sayari (2024) stated that the intermediation costs of a bank have a positive effect on bank performance. Bustamam and Dhenni (2016) have the same opinion, stating that intermediation costs have a positive influence on the profitability of Islamic banks in Indonesia. The results of this research are supported by Tharu and Shrestha (2019) intermediation cost indicator using the loan deposit ratio (LDR), the results of which have a positive effect on bank profitability. Based on this explanation, the following hypothesis was developed:

H_5: Intermediation costs have a positive influence on bank performance

Influence Credit Risk to Bank Performance

Based on previous research, there is a positive influence between credit risk on the financial performance of commercial banks in America and Europe (Daniul, Mesbaul & Sakila, 2022). This research is also supported by Nurmanita et al. (2024) who state that credit risk has a positive effect on banking performance. Similar results were studied by Abbas et al. (2019) that credit risk has a positive effect on profitability in developed Asian countries, similar to commercial banks in the US. Based on this explanation, the following hypothesis was developed:

H_6: Credit risk have a positive influence on bank performance

Influence of Capital Bank to Bank Performance

According to research results by Pham et al. (2024) bank capital provides significant positive results on ROA. These results are also supported by research of Bata et al. (2022). The statement by Helawa et al. (2024) states that there is a positive influence between capital structure on bank profitability in Indonesia. Based on this explanation, the following hypothesis was developed:

H_7: Bank capital has a positive influence on bank performance

2. METHODS

Variables Definition and Measurement

This research aims to determine and test the influence of internet banking variables, spread, non-performing loans to deposits, operating performance, intermediation costs, credit risk, and bank capital on bank performance. Secondary data previously obtained and collected was taken over a period of six years (2018-2023). This data comes from published annual reports and can be seen on the Indonesian Stock Exchange (BEI) website. This research uses panel data regression analysis method with E-views 9 software. The following is the measurement process for each variable:

Table 1. Definition and Measurement of Variables

Variable type	Variable name	Proxy	Symbol	Formula	Reference
Dependent variable	Bank Performance	Return on assets	ROA	$\dfrac{\text{Net Income}}{\text{Total Asset}}$	Sayari (2024)
		Return on equity	ROE	$\dfrac{\text{Net Income}}{\text{Total Equity}}$	Sayari (2024)
Independent Variable	Internet banking	Internet banking	INTB	Total Internet Banking transactions	Sayari (2024)
		Spreads	elementary school	The difference between the bid price and the ask price	Sayari (2024)
		Non-Performing Loans to Deposits	NPLDV	$\dfrac{\text{Non Performing Loans}}{\text{Deposits}}$	Sayari (2024)
		Operating Performance	OP	$\dfrac{\text{Operating income}}{\text{Total Assets}}$	Sayari (2024)
		Intermediation Costs	I.C	The overall costs associated with financial intermediation processes	Sayari (2024)
		Credit Risk	CR	$\dfrac{\text{Loan Loss Provisions}}{\text{Total Loans}}$	Sayari (2024)
		Capital Bank	STAMP	$\dfrac{\text{Total Equity}}{\text{Total Assets}}$	Pham et al (2024)

Sampling Method

In this research, the sampling method used was *purposive sampling.* The type of data used in research is quantitative. The data collection method in research is a secondary data collection method. The data source comes from the Indonesian Stock Exchange website (https://www.idx.co.id/) and from the websites of each company. The sample from this research covers 120 financial reporting periods, consisting of 20 banking companies for 6 years (2018-2023 period).

Table 2. Sampling Criteria

Information	Amount
Banking companies listed on the Indonesia Stock Exchange for the 2018-2023 period.	46
Banks whose data is incomplete in this study.	(9)
Banking companies with poor financial performance during the 2018-2023 period.	(17)
Companies that are worthy of being sampled	20
Total data used for research	120

The following are the steps for testing the regression model in this research:

Test Chow Test

There are two possible results from the Chow test results, namely common effect or fixed effect. The Chow test can be used in this research to determine which model is more effective and acceptable. The Chow test is based on two hypotheses, namely the null hypothesis where there is no individual heterogeneity and the alternative hypothesis which states there is cross-sectional heterogeneity.

Table 3. Test Chow

Dependent Variable	Chi-Square	Probability	Decision
ROA	47.919636	0.0003	H_0 rejected, Fixed Effect Which chosen
ROE	80.986879	0.0000	H_0 rejected, Fixed Effect Which chosen

Source: Processed data using E-views

Based on the Chow Test Table, for both models the results show that the *cross-section probability value* of the ROA *chi-square* is 0.0003 < 0.05, *the cross-section* of the ROE *chi-square* is 0.0000 < 0.05. This means that the decision obtained, namely H0, is rejected so that the model used is *fixed effect*. Because the results of the Chow test concluded that *the fixed effect model was chosen*, it is necessary to carry out the next test, namely the Hausman test, to choose between *the fixed effect model* and *the random effect model*.

Hausman Test

There are two possible results of the Hausman test, namely *random effect* or *fixed effect*. The Hausman test can be used in this research to determine which model is more accurate and better. Apart from that, the purpose of the Hausman test is to determine whether the characteristics of each model have heterogeneity.

Table 4. Hausman test

Dependent Variable	Chi-Sq. Statistics	Probability	Decision
ROA	18.839501	0.0087	H_0 rejected, *fixed effects* were chosen
ROE	4.310750	0.7434	H_0 is accepted, *Random Effect Model* is selected

Source: Processed data using E-views

Based on the results of the Hausman test in the table above, it can be seen that the *probability value* in the *cross section random* ROA test is 0.0087 < 0.05, Ho is rejected and H1 is accepted. Meanwhile ROE 0.7434 > 0.05, then H_0 is accepted and Ha is rejected, which means it has significance less than the 95% confidence level (α = 5%). Or it can be concluded that the *Fixed Effect Model method* is better used for the dependent variable ROA, while *the Random Effect Model* is better used for the ROE variable.

Data Analysis Method

Goodness of Fit Test (R²)

This test aims to find out how much influence the independent variable contributes to the dependent variable provided that the F test results in the regression analysis are significant. The value R^2 is between 0 and 1 ($0 < R^2 > 1$), where if the value approaches 1 then the independent and dependent variables have a closer relationship. If there are more than two variables, then the *adjusted* value is used R^2.

The coefficient of determination (*Adjusted* R²) essentially measures how far the model's ability is to explain variations in the dependent variable. *Adjusted* R Value ² ranges between 0-1% and if the value is close to 1, the better. The *Adjusted* R² value can be seen in the following table:

Table 5. Goodness of Fit Test Results

	Coefficient Determination		
Dependent Variable	**Model**	**R-Squared**	**Adjusted R-Squared**
ROA	Prob(F Statistics)	0.915572	0.910296
ROE	Prob(F-Statistics)	0.900707	0.894501

Source: Processed data using E-views

The results of the coefficient of determination in the table for the dependent variable using the ROA proxy show an Adjusted R Square value of 0.910296 or 91.02%, meaning that the dependent variable can be explained by all independent variables amounting to 91.01%, while 8.98% is explained by other variables not included in this research.

The results of the coefficient of determination in the table for the dependent variable using the ROE proxy show an Adjusted R Square value of 0.894501 or 89.45%, meaning that the dependent variable can

be explained by all independent variables at 89.45%, while 10.55% is explained by other variables that are not included in this study.

Simultaneous Test (F-test)

This test is used to test whether simultaneously there is a significant influence of the independent variable on the dependent variable. If the sig. of F < 0.05 means that the independent variable simultaneously has an influence on the dependent variable, so the regression model is suitable to be used. If the sig. of F > 0.05 means that simultaneously the independent variable has no influence on the dependent variable, so the regression model is not suitable for use.

Table 6. F Test Results

Simultaneous Test (F-Test)

Effects Test	Prob.	Hypothesis	Conclusion
ROA	0.0000	H_0 rejected	fluential significant
ROE	0.0000	H_0 rejected	ıfluential significant

Source: Processed data using E-views

The F statistical test is used to measure the accuracy of the sample regression function in estimating the actual value (Goodness of Fit). The F test tests whether the independent variable is able to explain the dependent variable well or tests whether the model used is fit or not (Ghozali, 2018). The F test in this study uses a significance level of 5%.

From the hypothesis table, it is known that the significant value for both the dependent variable with the ROA and ROE proxies shows a value of 0.000 < 0.05, which means that the independent variable has a simultaneous effect on the dependent variable and the model created is correct.

3. RESULTS AND DISCUSSIONS

Results

Descriptive Statistical Analysis

From the results of descriptive statistical testing for bank performance (ROA), a maximum value of 0.0345 was obtained by PT. Bank Central Asia Tbk. [BBCA] in 2023, and a minimum value of 0.0002 obtained by PT. Bank Sinarmas Tbk (BSIM) in 2019, the average ROA value was 0.012 greater than the standard deviation of 0.009, indicating that the data is homogeneous with small deviations.

From the results of descriptive statistical testing for bank performance (ROE), a maximum value of 0.209 was obtained by PT. Bank Mega Tbk. [MEGA] in 2021, and a minimum value of 0.001 obtained by PT. Bank Sinarmas Tbk (BSIM) in 2019. The average ROE value is 0.083 greater than the standard deviation of 0.054, indicating that the data is homogeneous with small deviations.

From the results of descriptive statistical testing for internet banking (INTB), a maximum value of 20.905 was obtained obtained by PT. Bank OCBC NISP Tbk. [NISP] in 2023 and a minimum value of 6,257 obtained by PT. Bank Ganesha Tbk. [BTPN] in 2018. The average INTB score was 15.63 greater than the standard deviation of 4.019, indicating that the data is homogeneous with small deviations.

Spread (SD) obtained a maximum value of 1084.0 obtained by PT Bank Mega Tbk. (MEGA) in 2018, and the minimum value is -24.00 obtained by PT. MayBank Indonesia Tbk [BNII] in 2020. The average SD value is 26.06 smaller than the standard deviation of 103.94, indicating that the data is varied with large deviations.

Net performing loan (NPL) obtained a maximum value of 0.063 obtained by PT Bank Sinarmas Tbk. (BSIM) in 2019, and a minimum value of 0.010 obtained by Bank Sinarmas Tbk . (BSIM) in 2023. The average NPL value is 0.024 greater than the standard deviation of 0.011, indicating that the data is homogeneous with small deviations.

Operational performance (OP) obtained a maximum value of 0.0427 obtained by PT Bank Central Asia Tbk. (BBCA) in 2023, and a minimum value of 0.0004 obtained by PT Bank Mayapada Internasional Tbk (MAYA) in 2022. The average OP value of 0.016 is greater than the standard deviation of 0.010, indicating that the data is homogeneous with a large deviation. small.

Intermediation cost (IC) obtained a maximum value of 0.684 obtained by PT Bank Syariah Indonesia Tbk (BRIS) in 2020, and a minimum value of 0.128 obtained by PT Bank Tabungan Negara (Persero) Tbk (BBTN) in 2019. The average IC value is 0.376 greater than the standard deviation of 0.105, indicating that the data is homogeneous with small deviations.

Credit risk (CR) obtained a maximum value of 0.089 obtained by PT Bank Sinarmas Tbk. (BSIM) in 2019, and a minimum value of -0.014 obtained by PT Bank Mayapada Internasional Tbk (MAYA) in 2021.

The average IC value is 0.015 greater than the standard deviation of 0.019, indicating that the data is homogeneous with small deviations.

Bank capital (CAP) obtained a maximum value of 0.350 obtained by PT Bank Ganesha Tbk. (BGTG) in 2022, and a minimum value of 0.060 obtained by PT Bank Tabungan Negara (Persero) Tbk (BBTN) in 2020. The average CAP value is 0.160 greater than the standard deviation of 0.048, indicating that the data is homogeneous with small deviations.

Table 7. Descriptive Statistics

Variable	Mean	Maximum	Minimum	Std. Dev.
ROA	0.012	0.0345	0.0002	0.009
ROE	0.083	0.209	0.001	0.054
INTB	15.63	20.91	6.257	4,019
SD	26.06	1084.0	-24.0	103.94
NPL	0.024	0.063	0.010	0.011
OP	0.016	0.0427	0.0004	0.010
IC	0.376	0.684	0.128	0.105
CR	0.015	0.090	-0.010	0.019
CAP	0.160	0.350	0.060	0.048

Source: Processed data using E-views

Individual Test (T-test)

This test is carried out to find out whether each independent variable has a significant influence on the dependent variable. The selection criteria are if the sig. of t < 0.05 then Ho is rejected, meaning that the independent variable has an influence on the dependent variable. If the sig. of t > 0.05 then ho is accepted, meaning the independent variable has no influence on the dependent variable.

Test results using panel data regression analysis in above shows the coefficient value 0.000153 and the probability INTB < 5% significance value (0.0186 < 0.05) then H_0 rejected and H_1 accepted. So it can be concluded that internet banking has a significant positive effect on bank performance (ROA). Furthermore, it is known that hypothesis testing on the dependent variable with the ROE proxy produces a coefficient value of 0.000215 and the probability of INTB > 5% significance value (0.5674 > 0.05) so H_0 accepted and H_1 rejected. So it can be concluded that internet banking has no effect on bank performance (ROE). The results of this research are in line with what was stated by Sayari (2024) who stated that internet banking has a significant positive effect on banking performance. Even though banks have implemented internet banking, the level of adoption by customers may not be optimal. Many customers may still feel comfortable with traditional banking methods or may not understand the use of new technology. As a result, the potential impact of internet banking on bank performance is not fully realized.

Test results using panel data regression analysis in above shows the coefficient value 0.0000344 and the probability is SD > 5% significance value (0.1327 > 0.05) then H_0 accepted and H_2 rejected. So it can be concluded that the spread has no effect on bank performance (ROA). Furthermore, it is known that testing the hypothesis on the dependent variable with the ROE proxy produces panel data regression analysis in above shows the coefficient value 0.0000042 and the probability is SD > 5% significance value (0.9702 > 0.05) then H_0 accepted and H_2 rejected. So it can be concluded that the spread has no effect on bank performance (ROE). In other words, the interest rate spread is not the main income of banking companies. The results of this research are not in line with research conducted by Sayari (2024). Spread has a positive effect on the financial performance of banks in Kenya, which means that it has an important role in determining whether Kenyan banks play an important role in the banking sector. Banks have earned significant income from non-interest sources such as fee-based income, commissions, trading and other banking services. This source of income can reduce the bank's dependence on pure interest income, so that the spread does not have a significant impact on bank performance.

Test results using panel data regression analysis in above shows the coefficient value -0.085358 and the NPL probability < 5% significance value (0.0014 < 0.05) then H_0 rejected and H_3 accepted. So it can be concluded that non-performing loans have a negative effect on bank performance (ROA). Furthermore, it is known that when testing the hypothesis on the dependent variable with the ROE proxy, the above results show a coefficient value of -0.448737, the probability of NPL < 5% significance value (0.0013 < 0.05)

then H_0 rejected and H_3 accepted. So, it can be concluded that net performing loans have a negative effect on bank performance (ROE). The results of this research are in line with research of Sayari (2024) that NPL has a positive effect on bank performance because there are several factors that influence profitability, one of which is NPL. It is possible that banks have effective risk mitigation mechanisms, or they are able to maintain profitability despite having high NPLs.

Test results using panel data regression analysis in above shows the coefficient value of 0.717626 and the OP probability < 5% significance value (0.0000 < 0.05) then H_0 accepted and H_4 rejected. So it can be concluded that Operation Performance has a significant positive effect on bank performance (ROA). Furthermore, it is known that testing the hypothesis on the dependent variable with the ROE proxy shows a coefficient value of 4.971540 and the probability of OP > 5% significance value (0.0000 > 0.05) so H_0 accepted and H_4 rejected. So, it can be concluded that Operation Performance has a significant positive effect on bank performance (ROE). Conventional banks that have integrated internet banking services into their operations. By offering an online platform for various banking transactions and services, conventional banks can simplify things like that. The findings show that conventional banks can contribute to cost efficiency and higher profit margins. This research is in line with the research results of Sayari (2024) which produce operational performance which has a significant positive correlation with bank performance. Managers who focus on operational efficiency will be more likely to optimize the use of bank assets and maximize revenues.

Test results using panel data regression analysis in above shows the coefficient value of 0.001690 and the OP probability > 5% significance value (0.5033 > 0.05) then H_0 accepted and H_5 rejected. So, it can be concluded that Intermediation Cost has a positive and insignificant effect on bank performance (ROA). Furthermore, it is known that when testing the hypothesis on the dependent variable with the ROE proxy, it shows a coefficient value of 0.014379 and the probability of OP > 5% significance value (0.4089 > 0.05) then H_0 accepted and H_5 rejected. So, it can be concluded that Intermediation Cost has a positive and insignificant effect on bank performance (ROE). The results of this research are in line with research by Sayari (2024) stating that the intermediation costs of a bank have no effect on bank performance. The results of this research are supported by the Tharu and Shrestha (2019) that intermediation cost indicator using the loan deposit ratio (LDR), the results of which have a positive effect on bank profitability. This shows that intermediation costs affect the profitability of the banking sector and support the real economy, where the higher the intermediation costs incurred, the lower the profitability.

Test results using panel data regression analysis in above shows the coefficient value of 0.036003 and the probability of CR < significance value 5% (0.0441 < 0.05) then H_0 rejected and H_6 accepted. So it can be concluded that credit risk has a significant positive effect on bank performance (ROA). Next, it is known that in testing the hypothesis on the dependent variable with the ROE proxy, the results of testing using panel data regression analysis in above shows the coefficient value of 0.113623 and the probability of CR < significance value 5% (0.0184 < 0.05) then H_0 rejected and H_6 accepted. So it can be concluded that credit risk has a significant positive effect on bank performance (ROE). So it can be stated that c credit risk significant effect on bank performance. This research is in line with research by Sayari (2024) which states that credit risk has a positive effect on banking performance. Good banks usually have a strong risk management system to deal with credit risk.

Test results using panel data regression analysis in above shows the coefficient value -0.000123 and the probability of CAP > 5% significance value (0.9821 > 0.05) then H_0 rejected and H_7 accepted. So it can be concluded that whether bank capital has a negative effect or not significant impact on bank performance (ROA). Furthermore, it is known that when testing the hypothesis on the dependent variable with the ROE proxy, it shows a coefficient value of -0.071479 and the probability of CAP < 5% significance value (0.0000 < 0.05) then H_0 rejected and H_7 accepted. So it can be concluded that bank capital has a significant negative effect on bank performance (ROE). Signaling theory explains that companies send signals to the market through various performance indicators. High capital is usually considered a signal of financial strength and stability.

Table 8. Individual Test Results (T-test)

	MODEL 1 ROA COEFF	PROB	Results	MODEL 2 ROE COEFF	PROB	Results	Conclusion
INTB	0.000153	0.0186**	Influential	0.000215	0.5674	No effect	Significant positive to ROA
SD	3.440006	0.1327	No effect	4.200007	0.9702	No effect	Not significant
NPL	-0.085358	0.0014**	Influential negative	-0.448737	0.0013**	Influential negative	Significant negative impact on ROA and ROE
OP	0.717626	0.0000**	Positive influence	4.971540	0.0000**	Influential positive	Significant positive on ROA and ROE
IC	0.001690	0.5033	No effect	0.014379	0.4089	No effect	Not significant
CR	0.036003	0.0441**	Influential positive	0.113623	0.0184**	Influential positive	Significant positive on ROA and ROE
CAP	-0.000123	0.9821	No effect	-0.071479	0.0000**	Influential negative	Significant negative impact on ROE
**) Significant at 5%							

Source: Processed data using E-views

Research Regression Model
The panel data regression model used by Sayari's previous research, 2024 can be written as follows:

$$BP = -0{,}00072 + 0{,}000153\,\textbf{INTB}_{it} + 0{,}00000344\,\textbf{SD}_{it} - 0{,}0853\,\textbf{NPL}_{it} + 0{,}7176\,\textbf{OP}_{it} + 0{,}00169\,\textbf{IC}_{it} + 0{,}0360\,\textbf{CR}_{it} - 0{,}000123\,\textbf{CAP}_{it}$$

$$BP = -0{,}1709 + 0{,}00021\,\textbf{INTB}_{it} + 0{,}00000042\,\textbf{SD}_{it} - 0{,}4487\textbf{NPL}_{it} + 4{,}971\,\textbf{OP}_{it} + 0{,}0143\,\textbf{IC}_{it} + 0{,}1136\,\textbf{CR}_{it} - 0{,}0714\,\textbf{CAP}_{it}$$

Information:
ROA   = Return on Assets
ROE   = Return on Equity
SD   = Spread
NPLDV   = Non-Performing Loans to Deposits
OP   = Operating Performance
IC   = Intermediation Cost
CR   = Credit Risk
INTB   = Internet Banking
CAP   = Bank Capital
β_0 = Constant
$\beta_1\,\beta_2\,\beta_3$ = Regression coefficient
ε = Standard error

4. CONCLUSION

The research into various determinants of bank performance yielded several insightful conclusions. It was found that internet banking has a significant positive impact on the return on assets, indicating that digital banking solutions enhance financial outcomes. Interestingly, the spread variable showed no effect on performance, suggesting that the difference between the interest income generated and the amount of interest paid out to lenders might not be as crucial as traditionally thought. Conversely, non-performing loans (NPLs) negatively affect bank performance, underscoring the importance of credit risk management. Operational performance was positively correlated with overall bank performance, highlighting the effectiveness of streamlined operations. The intermediation cost variable, which includes the costs associated with lending and deposits, did not influence bank performance, indicating that other operational factors might play more significant roles. Surprisingly, credit risk exhibited a positive influence on bank performance, possibly reflecting well-managed banks' ability to handle higher risks profitably. Lastly, a significant negative impact of bank capital on return on equity was observed, suggesting that while capital is essential, its management can be complex and may impact profitability adversely.

This study offers valuable implications for financial managers and investors. For financial managers, the insights from the research should encourage a reevaluation of the factors influencing bank performance, such as internet banking, operational efficiency, and credit risk management. The positive

impact of internet banking, for instance, suggests that banks should continue to invest in and expand their digital services to meet customer expectations and enhance financial performance. Meanwhile, investors can use the findings to make informed decisions by considering the financial health of banks. The study points out the importance of assessing potential profits and risks associated with credit risk, as well as the need for thorough fundamental analysis and portfolio diversification to mitigate risks.

While the study provides comprehensive insights, it also acknowledges certain limitations that could influence the results, such as the scope of factors analyzed. Future research could broaden the investigation to other sectors or extend the timeframe of the study to confirm the consistency of these findings over longer periods. Additionally, incorporating variables such as loan development, as suggested in recent research by Pham et al. (2024), could further enrich the understanding of factors influencing bank performance. This expansion of scope and variables would not only benefit future academic inquiries but also provide more robust tools for industry practitioners aiming to optimize financial performance in an increasingly complex banking landscape.

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