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The Influence of Internal Company Factors on Net Interest Margin and Return on Equity of Digital Banks in Indonesia

I Wayan Budi Artha
Universitas Triatma Mulya, Bali, Indonesia, budiartha121@gmail.com

Corresponding Author: budiartha121@gmail.com

Abstract: The primary revenue of digital banks in Indonesia still relies on interest income earned from lending, in addition to fees and commissions. Therefore, the size of the net interest margin is crucial in calculating digital bank profitability, which will affect their return on equity. This study aims to examine factors affecting the net interest margin and return on equity of digital banks from an internal company perspective. The results of this study indicate that the net interest margin of digital banks is influenced by assets, the composition of low-cost funds, and the amount of non-performing loans. The greater the composition of low-cost funds, the lower the cost of funds and the smaller the non-performing loans, the higher the credit productivity which affects the greater net interest margin. The return on equity of digital banks is influenced by the level of capital and efficiency, namely the ratio of operating costs to operating income and its net interest margin. The large capital of digital banks and accompanied by savings in operating costs, provide room for digital banks to continue to grow and expand to increase profitability so that their return on equity is even greater.

Keywords: Digital Banks, Internal Company Factors, Net Interest Margin and Return on Equity.

INTRODUCTION

Advances in technology and information, particularly digital technology, have given rise to new digital-based financial products and services. The emergence of new players in the banking and financial services industry, including start-ups and financial technology (fintech) companies, has transformed the competitive landscape in the financial industry.(Rasyid, 2020; Sugiarto, 2022; Wijaya, 2022).

The development of fintech is more related to and targets the core business of banks, namely in fund management (fintech funding), financing (financing fintech)) and other financial services (services), especially payment transaction services (fintech payments). The advantages of fintech in utilizing technology have made fintech quickly accepted by the public due to its ease and speed in services, by exploiting gaps that have not been served or optimally utilized by banks. Although in the initial stage of its presence only online applications, over

time the applications offered have increased and are felt to be increasingly disruptive (have disrupted) the banking business.(Sugiarto, 2022; Wijaya, 2024)

The presence of fintech and digital technology is a challenge for banks to immediately carry out digital transformation to increase productivity, efficiency and business agility.(Pasaribu & Widjaja, 2020; Perkin & Abraham, 2020; Wijaya, 2022). Fintech disruption and the emergence of the Covid-19 pandemic have accelerated digital transformation in the banking industry, and even some banks have transformed and or formed digital banks that are completely technology-based without the physical presence of bank branches other than the head office or the use of very limited branch offices, which serve customers for various transactions online and in real time, anywhere and anytime without the need to go to the bank(Indriasari et al., 2022; King, 2020; Rasyid, 2020; Skinner, 2014; Wijaya, 2022).

Digital-based financial transactions have become a necessity for people in their daily lives. Therefore, the presence of digital banks can no longer be denied. Digital banks can boost financial inclusion for people who have previously struggled to access banking services.(Sugiarto, 2022; Wijaya, 2022).

The presence of digital banks in Indonesia has received full support from the Financial Services Authority (OJK) with the issuance of POJK Number 12/POJK.03/2021 dated July 30, 2021 concerning Commercial Banks (Financial Services Authority, 2021), which provides guidelines for the establishment and governance of digital banks. This anticipatory measure by the Financial Services Authority (OJK) has provided an opportunity for banks to provide digital banking services, whether through the establishment of new digital banks or the conversion of existing banks. Several major banks, such as BCA, Mandiri, BRI, and others, have also established or transformed their subsidiaries into digital banks.

The primary revenue stream for digital banks in Indonesia still comes from interest income from lending, in addition to fee and commission income from digital transactions. Therefore, the net interest margin plays a crucial role in calculating a digital bank's profitability, which ultimately impacts its return on equity. An increase in the net interest margin positively impacts a bank's financial performance, including its return on equity, which reflects the bank's efficiency and profitability in generating profits. Digital banks generally have higher net interest margins and returns on equity compared to conventional banks due to increased operational efficiency resulting from the use of technology.(Anggraini & Abidin, 2025; Prasetyo & Shinta, 2022; Siswati & Hermansyah, 2025; Tamami et al., 2025).

Over the past six years, from 2019 to 2024, the net interest margins of digital banks in Indonesia have fluctuated, as has the development of their return on equity. Although the net interest margins are positive, the return on equity is not always positive; some banks experienced negative returns on equity during certain periods. The fluctuations in net interest margins and returns on equity of digital banks are interesting to study. This study aims to identify factors influencing the net interest margins and returns on equity of digital banks in Indonesia, particularly from the company's internal perspective.

According to (Johnson, 2020) that a digital bank is a business organization that offers online banking activities, generally through mobile applications, which were previously only available at branch offices. Next (Wijaya, 2022) stated that the term "digital bank" is often associated with new forms of banking business, giving rise to the terms "challenger bank," "neo bank," or "beta bank." Digital banks are often associated with indicators of limited office use (branchless, officeless, or physicalless), with the digitization of various business processes, resulting in streamlined business processes and, of course, cost reduction.

The Financial Services Authority (OJK) has provided policy support for the establishment of digital banks in Indonesia, through the issuance of POJK No. 12/POJK.03/2021 dated July 30, 2021, concerning Commercial Banks. According to(Financial Services Authority, 2021) the definition of a digital bank has been clarified, namely "a bank

incorporated in Indonesia that provides and carries out business activities primarily through electronic channels without a physical office other than the head office or using limited physical offices that are intended to be able to maximize the use of existing customer data to provide faster and easier services according to customer needs that can be carried out independently." Furthermore, other requirements are stipulated by the OJK to become a digital bank, you need to have a business model supported by the use of modern technology, adequate risk management, and supported by good governance and the competence of a board of directors with expertise in information technology. It also needs to have the ability to safeguard and protect customer data.There are two ways to establish a digital bank: a new bank with a minimum paid-up capital of IDR 10 trillion, or an existing bank (conventional bank) legally incorporated in Indonesia can transform into a digital bank with a minimum capital requirement of IDR 3 trillion. The high capital requirements for establishing a digital bank are necessary given the high cost of technology investment and also to maintain and ensure the bank's strong liquidity and solvency.

Furthermore, according to (Sugiarto, 2022), said that the success or failure of the transformation of conventional banks into digital banks will depend on several factors, including: following consumer needs, commitment to change, choosing the right strategy, providing digital talent, strengthening risk management (cyber risk, data protection risk, business continuity risk) and educating consumers about adequate digital literacy.

Digital banks' revenue sources still rely on interest income. Therefore, it is crucial for banks to measure their ability to generate net interest margin (NIM), which measures the bank's ability to generate net interest income from its earning assets.(Kasmir, 2012). A high NIM is certainly highly desired by all digital banks. Digital banks have a relatively high NIM, and their NIM tends to be higher than that of conventional banks.(Anggraini & Abidin, 2025; Tamami et al., 2025). The high NIM of digital banks is due to more efficient operational costs through the use of digital technology and business models with collaborative strategies carried out with digital platforms in credit distribution focused on retail credit products with small limits and short terms with high interest charges.

Considering that the net interest margin (NIM) is related to interest income and costs, of course many factors influence it such as assets, mobilization of low-cost funds obtained, the bank's ability to distribute credit from the funds collected, the productivity of the loans distributed and of course the level of capital it has, in addition to other external and internal factors.

The size of assets, particularly productive assets, will impact a digital bank's ability to generate net interest income. The larger the assets, the greater the bank's ability to generate income. However, if a digital bank's assets are primarily physical, these assets can actually increase operational costs.(Chrisdiouf & Linawati, 2024; Susanti et al., 2024; Warno & Farida, 2021).

Operational costs, especially the cost of funds of digital banks will certainly greatly affect their net interest income. Digital banks will strive to continue to reduce their cost of funds by increasing the composition of their low-cost funds (current account savings account – CASA) so that their net interest margin increases (Warno & Farida, 2021).

A bank's ability to disburse credit from its collected funds and equity, or loan-to-deposit ratio (LDR), is vital to achieving its net interest income (NIM). The higher the LDR, the greater the interest income earned.(Susilawati & Nurulrahmatiah, 2021) The ideal LDR is 85% - 100%, with a maximum of 110%. LDR is a bank's liquidity ratio that indicates the bank's ability to repay withdrawals by depositors, relying on the amount of credit provided as its source of liquidity (Hery, 2019; Kasmir, 2012).

High credit productivity due to good credit quality will result in a high net interest margin. Credit quality is measured by the size of non-performing loans (NPLs). A higher NPL

will reduce the productivity of disbursed credit, which (reduced interest income, while increasing loan provisioning) will result in a further decline in the net interest margin.(Warno & Farida, 2021). Capital is measured by the size of the capital adequacy ratio (CAR), which measures the adequacy of capital held by digital banks to support risky assets (Hery, 2019; Kasmir, 2012). The higher the CAR, the better the bank's ability to develop its business and bear the potential risk of losses resulting from bank operations.

The level of return on equity is seen from the return on equity (ROE), which is a ratio used to measure a bank's ability to manage its equity to generate net income (Hery, 2019; Kasmir, 2012). A digital bank that has and is able to increase its ROE demonstrates its effectiveness in managing its equity to generate profits. A high ROE indicates a high return on equity, which is certainly attractive to investors.

A digital bank's return on equity (ROE) is closely related to its ability to generate net profit, specifically related to cost control and revenue generation. This is of course related to assets and capital under management, the bank's ability to mobilize funds, particularly low-cost funds, its ability to disburse credit and its productivity (credit quality), its efficiency (the ratio of operating costs to operating income), and its ability to generate net interest margins from its core activities as an intermediary institution, in addition to other external and internal factors.

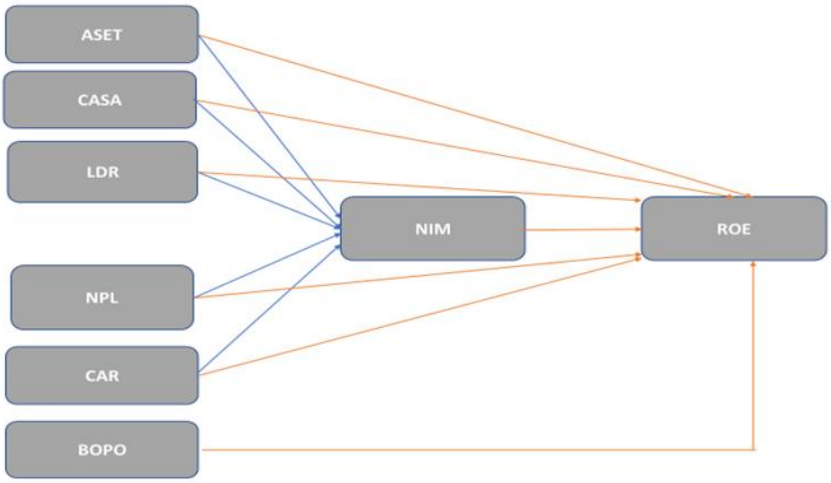
The greater the assets managed digitally, the greater the bank's ability to generate profits, which will have an impact on increasing the ROE received (Afifa, 2024; Hendari et al., 2024). Likewise, the greater the capital owned, the greater the opportunity to grow and expand the business to generate profits and ROE (Febby et al., 2016; Susanti et al., 2024).

The bank's ability to collect low-cost funds (CASA) will result in a decrease in the cost of funds (COF) and increase the NIM of digital banks, which will ultimately increase the profits and ROE of digital banks.(Susanti et al., 2024; Warno & Farida, 2021).

A high level of liquidity, namely the bank's ability to distribute credit from its own funds and capital, will increase digital bank income and increase ROE (Afifa, 2024; Yuniarti et al., 2024), which of course is accompanied by a high level of credit productivity and a low level of NPL(Susanti et al., 2024; Yuniarti et al., 2024)

Conceptual Framework

From the description of the research results above, a conceptual framework was compiled as presented in Figure 1.



Source: Research Results

Figure 1.Conceptual Framework

Regression Formula

From the research results and the conceptual framework above, the following regression formula model was created:

Equation I

$$NIM_i = \alpha + \beta 1ASSET + \beta 2CASAi + \beta 3LDR_i + \beta 4NPL_i + \beta 5CAR_i + \epsilon i$$

Equation II

$$ROE_i = \alpha + \beta 1ASSET + \beta 2CASAi + \beta 3LDR_i + \beta 4NPL_i + \beta 5CAR_i + \beta 6BOPO_i + \beta 7NIM_i + \epsilon i$$

Information:

α = constant	CAR = Capital
β = regression coefficient	BOPO = Operational Costs / Operational Income
Assets = Amount of assets	NIM = Net Interest Margin
CASA = Low Cost Funds	ROE = Rate of Return on Equity
LDR = Liquidity	ϵ = error term
NPL = Credit Quality	

METHOD

This research uses a quantitative research method with a causal design and the research sample was taken using purposive sampling.(Creswell, 2015; Sugiyono, 2018) by considering digital banks, both newly established and existing banks that have transformed into digital banks, listed on the Indonesia Stock Exchange for the past 6 (six) years or registered since 2018 and have a positive net interest margin (NIM). There are 5 (five) banks used as samples, namely BTPN (SMBC), Bank Jago, Bank Raya, and Bank Neo Commerce. The data used is secondary data in the form of panel data that has been documented for six (6) years on a quarterly basis, starting from 2019 to 2024. Multiple linear regression analysis is used to analyze the factors that influence the net interest margin (NIM) and the return on equity (ROE) with SPSS (Ghozali, 2018; Sujarweni, 2015).

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

Descriptive statistical analysis was used to obtain a general overview of the data used for the study, including both independent and dependent variables, including the calculation of the mean, extreme values (maximum and minimum), and standard deviation. The results of the descriptive statistical tests on the variables used are presented in Table 1.

Table 1. Descriptive Statistic

Variables	N	Minimum	Maximum	Mean	Standard Deviation
NIM	120	2.05	18.46	6.1647	3.79822
ROE	120	-95.44	26.17	-2.5518	20.61123
ASSET	120	.67	202.54	45.4385	66.55929
BOPO	120	39.94	287.86	103.6960	44.10089
CASA	120	6.58	73.21	27.6378	15.46580
LDR	120	47.54	210.43	106.4269	34.12012
NPL	120	.00	16.73	2.7621	2.60753
CAR	120	15.26	538.01	52.5637	64.70556
Valid N (listwise)	120				

Source: SPSS Output Version 22

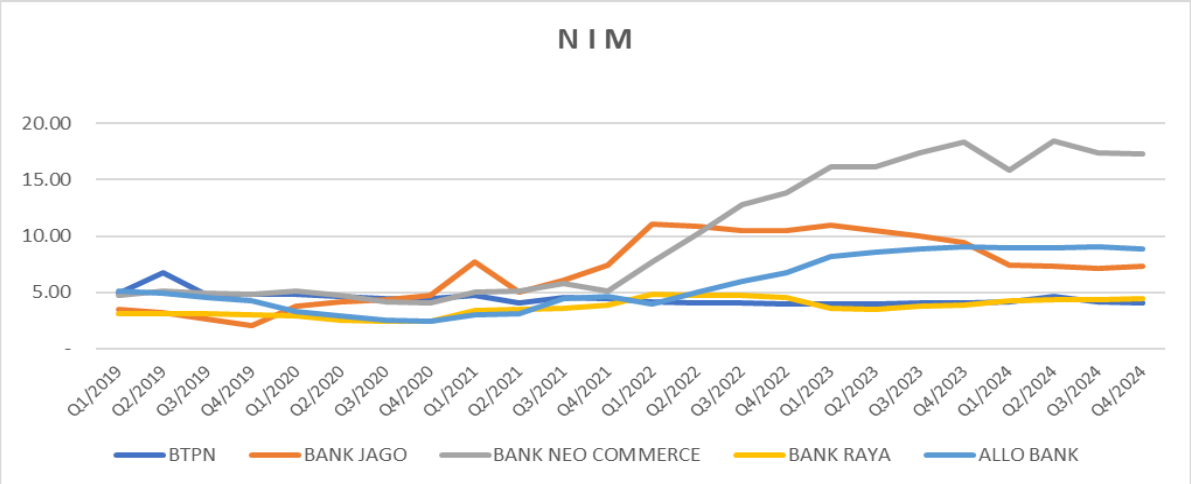
The average net interest margin (NIM) of digital banks is 6.17%, with the highest NIM of 18.46% obtained by Bank Neo Commerce in Q2/2024, while the lowest NIM of 2.05% was owned by Bank Jago in Q4/2019. In 2019, Bank Jago's NIM (at that time still Bank Artos and was being acquired on December 26, 2019 to become Bank Jago) had a low NIM, but after the acquisition, its NIM gradually increased and reached 10.46% in Q2/2023. Bank Neo Commerce has a relatively high NIM because the loans given are more to consumer loans that have large returns and target high-risk debtors with high rates, in addition to operational efficiency. The increase in NIM of Bank Jago and Bank Neo Commerce shows that the two digital banks are increasingly effective in managing their assets and liabilities to generate profits from net interest.

Over the past few years, many digital banks have experienced losses, with the average return on equity (ROE) of digital banks remaining at minus 2.55%. The highest ROE of 26.17% was achieved by Allo Bank in Q2/2020, and the lowest at -95.44% was achieved by Bank Raya in Q4/2021.

Many digital banks are still experiencing losses, as evidenced by the high average BOPO (103.70%) for digital banks due to high operational costs, specifically for purchasing new technology and preparing other infrastructure, high promotional costs for marketing to attract new customers, and the impression that digital banks were initially "burning money" due to intense competition. Digital banks' capitalization is quite substantial and their technology is quite capable, but their ability to mobilize low-cost funds remains low, requiring continued improvement. Their liquidity levels are good and non-performing loans are under control, which means that by the second semester of 2024, all digital banks will have achieved profits, resulting in positive ROEs.

Development of Net Interest Margin Digital Banks

The Net Interest Margin (NIM) of digital banks is highly volatile. Bank BTPN (SMBC) and Bank Raya's NIMs are still less aggressive (still stagnant), ranging from 3% to 5%, compared to Bank Jago, Bank Neo Commerce, and Allo Bank, whose NIMs have grown significantly, exceeding 7% in the past three years and even reaching 18.46%, as shown in Figure 2.



Source: IDX and Bank Digital's Quarterly Published Financial Report

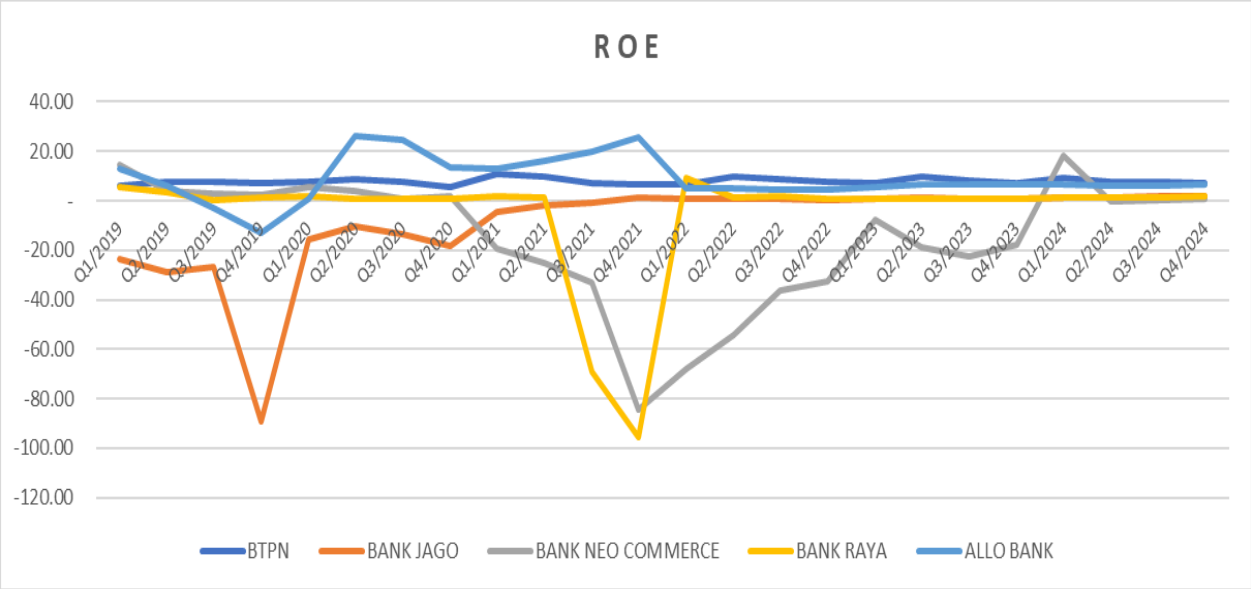
Figure 2. Development of NIM Digital Banks

The development of digital bank NIM is quite good, even higher than conventional banks.(Anggraini & Abidin, 2025; Tamami et al., 2025), indicating that digital banks have been able to become more effective in managing their productive assets, especially in maintaining

the productivity of the loans they distribute (NPI remains under control) and their liabilities to generate profits from net interest.

Development of Return on Equity Digital Banks

The Return on Equity (ROE) of digital banks fluctuates significantly. Several digital banks are still experiencing losses, resulting in a negative average ROE, with some even approaching or exceeding minus 80%-90%, such as Bank Jago, Bank Raya, and Bank Neo Commerce. PTPN Bank (SMBC) is a digital bank that has maintained its profitability even during the COVID-19 pandemic, with an ROE ranging between 5.68%-10.93%. In the past year (SM2/2024), all digital banks have achieved profits, resulting in positive ROEs, as shown in Figure 3.



Source: IDX and Bank Digital's Quarterly Published Financial Report

Figure 3. Development of ROE Digital Banks

Multiple Linear Regression Analysis

Regression Analysis of Net Interest Margin Digital Banks

Partial Test Results

The results of the regression test, namely a partial test regarding the factors that influence the net interest margin (NIM) of digital banks are presented in Table 2.

Table 2. Regression Test Results on the Effect of Assets, Low-Cost Funds, Liquidity, Non-Performing Loans, and Capital on the Net Interest Margin of Digital Banks

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	7,401	1,750		4,230	.000
	ASSET	-.017	.007	-.292	-2,538	.012
	CASA	.064	.023	.260	2,801	.006
	LDR	-.010	.013	-.087	-.745	.458
	NPL	-.368	.157	-.253	-2,339	.021
	CAR	-.004	.006	-.063	-.620	.537

Source: SPSS Output Version 22

From the results of the partial test, several factors that significantly influence the net interest margin (NIM) of digital banks are assets, the size of the composition of low-cost funds (CASA) and credit quality (NPL) while liquidity (LDR) and capital have no effect.

From the results of the partial test, the regression formula can be made as follows:

NIM = 7,401 -0.017 ASSETS + 0.064 CASA - 0.010 LDR - 0.368 NPL -0.004 CAR + e

It appears that the largest factor influencing the net interest margin (NIM) of digital banks is credit quality (NPL), which negatively impacts NIM. This indicates that during the study period, NPLs were relatively high, averaging 2.76%. Conversely, NPLs had a positive effect on NIM (Chrisdiouf & Linawati, 2024) and the composition of low-cost funds that are positively correlated with the NIM of digital banks.

Digital banks should focus more on strategies to maintain and improve their net interest margin (NIM), such as offering more competitive loan products and improving credit quality, and managing their cost of funds more efficiently. By increasing their NIM, digital banks can strengthen profits and contribute more value to shareholders through higher ROE.

Simultaneous Test Results

The results of the simultaneous test (F Test) of the net interest margin show a significance of 0.001 or less than 5% as presented in Table 3.

Table 3. Simultaneous Test Results (F-Test)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	298,584	5	59,717	4,800	.001
	Residual	1418.167	114	12,440		
	Total	1716,751	119			

Source: SPSS Output Version 22

This explains that assets, low-cost funds, liquidity, credit quality and capital simultaneously or jointly influence the net interest margin (NIM) of digital banks.

Results of the Determination Coefficient Test

The results of the Determination coefficient test produced an R Square of 0.174 or 17.40% with an Adjusted R Square of 0.138 or 13.80% as presented in Table 4.

Table 4. Results of the Determination Coefficient Test

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.417	.174	.138	3.52705

Source: SPSS Output Version 22

Adjusted The R Square obtained is small, only 0.138, indicating that only 13.80% of the digital bank's net interest margin (NIM) can be explained or influenced by the variables studied, namely assets, low-cost fund composition, liquidity, credit quality and capital, while the remaining 82.60% is explained by other variables not studied, such as other internal bank factors and external bank factors: BI rate, inflation, currency exchange rates, economic growth, etc.

Multiple Linear Regression Analysis of Return on Equity Digital Banks

Partial Test Results

The results of the regression test (partial test) regarding the factors influencing the rate of return on equity of digital banks are presented in Table 5.

Table 5. Regression Test Results of the Influence of Assets, Low-Cost Funds, Liquidity, Non-Performing Loans, Capital, Efficiency and Net Interest Margin on Return on Equity of Digital Banks

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	34,865	7,696		4,530	.000
	ASSET	.026	.021	.083	1,233	.220
	CASA	.083	.073	.063	1,145	.255
	LDR	.004	.046	.006	.083	.934
	NPL	.690	.499	.087	1,383	.169
	CAR	.062	.019	.196	3,200	.002
	BOPO	-.405	.027	-.866	-14,884	.000
	NIM	-.735	.294	-.135	-2,504	.014

Source: SPSS Output Version 22

From the results of the partial test, several factors that significantly affect the rate of return on equity of digital banks are capital (CAR) and efficiency (BOPO) as well as net interest income (NIM), while assets, low-cost funds (CASA), liquidity (LDR) and credit quality (NPL) have no effect.

From the results of the partial test, the regression formula can be made as follows:

$$ROE = 34{,}865 + 0.026\ ASSETS + 0.083\ CASA + 0.004\ LDR + 0.690\ NPL + 0.062\ CAR - 0.405\ BOPO - 0.735\ NIM + e$$

The greater a digital bank's capital, the greater its ability to expand and cover the potential risk of operational losses, including improving its technological capabilities and cybersecurity, which will ultimately increase its profits and ROE. This is consistent with research from(Febby et al., 2016; Susanti et al., 2024) that capital has a positive effect on ROE bank. The ROE of digital banks is also influenced by the ratio of operating costs to operating income (BOPO) because it directly impacts digital bank profits. Similarly, the NIM also directly impacts bank operating income. A higher BOPO results in a lower ROE. (Febby et al., 2016; Susanti et al., 2024; Warno & Farida, 2021).

Simultaneous Test Results

The results of the simultaneous test (F Test) of the digital bank's return on equity show a significance of 0.000 or less than 5% as presented in Table 6.

Table 6. Simultaneous Test Results (F Test)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37322.389	7	5331.770	45,131	.000
	Residual	13231.533	112	118,139		
	Total	50553.922	119			

Source: SPSS Output Version 22

This explains that assets, low-cost funds (CASA), liquidity (LDR), credit quality (NPL), capital (CAR), efficiency (BOPO) and net interest income (NIM) simultaneously or jointly influence the rate of return on equity of digital banks.

Results of the Determination Coefficient Test

The results of the Determination coefficient test obtained an R Square of 0.738 or 73.80% with an Adjusted R Square of 0.722 or 72.20% as presented in Table 7.

Table 7. Results of the Determination Coefficient Test

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.859	.738	.722	10.86916

Source: SPSS Output Version 22

Adjusted the R Square obtained at 0.722 shows that 72.20% of the return on equity (ROE) of digital banks can be explained or influenced by the variables studied, namely assets, low-cost fund composition (CASA), liquidity (LDR), credit quality (NPL) and capital (CAR), efficiency (BOPO) and net interest income (NIM), while the remaining 27.80% is explained by other variables not studied.

To increase ROE, collaboration with fintech companies and other digital financial application managers is expected to continue, while maintaining efficiency. Likewise, capitalization, governance, and the implementation of risk management and cybersecurity must be maintained and improved to maintain and enhance customer trust, ultimately resulting in increased profits.

CONCLUSION

A digital bank's net interest margin is influenced by the size of its assets under management, the composition of low-cost funds, and the size of its non-performing loans, while liquidity and capital are not affected. A larger low-cost fund composition, coupled with efficient fund management and a smaller non-performing loan, results in lower funding costs and credit provision costs, which in turn increases its net interest margin, ultimately delivering greater value to shareholders through a higher return on equity. A digital bank's return on equity is influenced by its capital, operating expense to operating income ratio, and net interest margin. While assets, low-cost funds, liquidity, and non-performing loans are not affected. A digital bank's substantial capital, coupled with operational cost savings, provides room for growth and continued expansion to increase profits, thus increasing its return on equity.

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