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The Effect of Liquidity, Liquid Assets, and Non-Performing Loans on Financial Performance with Cost Efficiency As A Moderation Variable Banking Listed on The Indonesia Stock Exchange

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ABSTRACT

Objectives*: This investigation aimed to ascertain the influence of Liquidity, Capital Adequacy, and Non-Performing Loans on Financial Performance while considering the moderating role of Cost Efficiency.*
Methodology*: This study utilizes secondary data collected through purposive sampling. 100 samples were selected based on specific criteria over 5 time periods using the EViews testing tool. The data was analyzed using Panel Data Regression with Moderating Regression Analysis.*
Finding*: Liquidity and capital adequacy positively impact financial performance, while non-performing loans have no significant effect. Cost efficiency strengthens the positive effects of liquidity and capital adequacy but not of non-performing loans.*
Conclusion*: Enhancing financial performance is crucial for any organization, and liquidity and capital adequacy play a vital role in achieving this goal. These factors have been proven to have a favorable impact on the overall financial health of a company. Conversely, non-performing loans appear to have a negligible impact on financial performance. However, cost efficiency can further strengthen the positive effects of liquidity and capital adequacy, but it does not have the same impact on non-performing loans. Hence, focusing on maintaining high levels of liquidity and capital adequacy, along with improving cost efficiency, can greatly contribute to enhancing financial performance.*

Keywords*: liquidity; capital adequacy; non-performing loans; cost efficiency.*

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INTRODUCTION

Bank Indonesia implemented a transition from the CAMELS method to the RGEC method for bank health assessment in January 2012. The RGEC method emphasizes Risk Profile, Good Corporate Governance, Earnings, and Capital, offering a comprehensive evaluation framework. This regulatory change, stipulated under Bank Indonesia Regulation No. 13/1/PBI/2011, aims to enhance the robustness of banks in addressing global challenges (Damaranti et al., 2018). The CAMELS method, as highlighted in (Ben Lahouel et al., 2024), mainly concentrates on Capital, Asset Quality, Management Capability, Earnings, Liquidity, and Sensitivity to market risk, emphasizing the positive side of the business. On the other hand, the RGEC method, as discussed in (Abdullah, 2020), not only considers Risk profile, good governance, Income, and Capital but also covers the downside of the business, providing a more comprehensive evaluation of bank performance. While CAMELS focuses more on the positive aspects of a bank's operations, RGEC offers a broader perspective by incorporating risk management and governance factors, making it a more holistic approach to assessing bank soundness (Dincer et al., 2011).

According to *idnfinancials.com*, the average banking companies' financial performance, measured by the ROA ratio, showed a decrease from 2018 (1.53%) to 2019 (1.52%), and further decreased to 1.02% in 2020. However, in 2021, the Financial Performance of Banking Companies saw an increase to 1.43%, and in 2022, it further improved to 1.68%. Analyzing the 5-year average, we can see that two years, 2020 and 2021, fall below the average, while the years 2018, 2019, and 2022 surpass the 3-year average. Although the ROA trend shows an increase since 2020, there are several problems associated with ROA. An issue that has been identified is the fluctuation in banks' financial performance, specifically measured by the ROA ratio from 2018 to 2022. Specifically, there was a significant decline in 2020 of 1.02%, which was then followed by a gradual increase in 2021 and 2022 of 1.43% and 1.68%, respectively. Moreover, the research shows that a declining ROA ratio indicates that banks are not able to generate high enough returns from their assets, which is directly related to a high level of liquidity where most assets may not be optimally utilized to generate income.

In the banking industry, liquidity is of utmost importance as banks rely heavily on the ability to meet deposit withdrawals and fund loan disbursements (Sufyani & Cahbana, 2024). Having strong liquidity allows banks to meet their short-term obligations, while sufficient capital adequacy acts as a safeguard against financial and operational risks. The theory of liquidity proposes that companies with abundant liquidity are better equipped to fulfill short-term commitments without having to sell assets at lower prices or take on additional loans (Supiani et al., 2022).

For banks, maintaining capital adequacy is essential to fortify against unexpected losses (Satoto et al., 2023). They manage diverse risks like credit, market, and operational risks to ensure resilience. These risks emphasize the requirement for a robust buffer that ensures the stability and resilience of the banking sector remains paramount. Inadequate capital can leave a bank vulnerable to absorbing losses, which can have severe consequences on its financial health. When capital is insufficient, a bank's potential for growth, lending, and profit generation is restricted. The concept of capital adequacy underscores the cruciality of banks maintaining ample capital to withstand unforeseen losses and ensure ongoing financial stability. The financial well-being of a bank and its resilience in the face of unexpected economic circumstances can be gauged by its capital adequacy (Pratama et al., 2021).

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The research underscores the pivotal role of liquidity, liquid assets, and management of non-NPLs in optimizing financial performance. Commercial banks in Bangladesh, navigating liquidity risk, are influenced profoundly by metrics including the NPL ratio, CAR, LTD ratio, and DTA ratio (Yeasin, 2023). Highlighting the importance of liquidity, banks benefit from maintaining a healthy balance between short-term obligations and long-term goals. Research consistently supports the notion that a favorable LDR positively impacts profit growth, reinforcing the strategic value of liquidity management (Dzapasi, 2020). NPLs are a significant criterion for assessing a bank's performance, as they can negatively impact a bank's financial stability and profitability. Research has shown that NPLs can have an unfavorable and statistically profound impact on profit growth, thus their moderation may affect the relationship between liquidity and loan deposit ratios on profit growth (Spaseska et al., 2022). These factors are essential for understanding banking institutions' financial results and are widely utilized in conjunction with other metrics, such as the CAR, to assess a banking entity's overall health and efficiency.

In addition, non-performing loans were identified as significant on return on assets, while loan to deposit ratio (LDR) indicates a beneficial influence in terms of its impact on ROA (Iskandar et al., 2023; Kartika, 2023; Arief, H, et al., 2024). This research is intended to fill an empirical void by presenting new evidence and a thorough review of the effect of liquidity and capital adequacy on bank profitability, while also introducing Cost Efficiency as a moderation factor to better comprehend such relationships in contemporary banking.

Several studies from Nigeria, Indonesia, and Sub-Saharan Africa emphasize that low liquidity can be detrimental to bank profitability and stability. Non-performing loans (NPLs) have a mixed impact on return on assets (ROA). Cost efficiency is also important in strengthening or weakening the influence of credit risk and bank financial performance (Shittu & Abdulkadir, (2023); Wahyudi, (2023) and Yahaya et al., (2022)).

This study seeks to analyze the impact of key financial metrics (CAR, NPL, Operating Cost to Operating Income Ratio (BOPO), and Liquidity Ratio) on enhancing bank profitability, gauged by ROA and ROE. Likewise, whether NPL moderates the link between LDR and financial performance, also explores how operational efficiency influences the effects of NPL with a focus on understanding the dynamics that affect the financial results of banks listed on the Indonesia Stock Exchange during the period spanning 2018 to 2022.

LITERATURE REVIEW

Liquidity (Loan to Deposit Ratio)

The Loan to Deposits Ratio (LDR) acts as a critical financial metric deployed to evaluate bank liquidity. It's calculated by dividing total loans by total deposits. This ratio is indispensable for evaluating a bank's preparedness to meet short-range financial obligations. The LDR plays a role as a key signal of financial health and stability. A higher LDR indicates greater lending relative to deposits, potentially raising solvency risks. Conversely, a lower LDR signifies higher liquidity with more deposits than loans, offering resilience against financial uncertainties (Marjohan, 2020).

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Effect of Capital Adequacy

Bank capital adequacy signifies the bank management's capability to effectively oversee and manage potential risks that may impact the bank's capital (Muarif & Padli, 2019). According to Masno (2021), the company's debt and equity comparison capital requires an analysis to determine a target capital structure that shapes the company's finances. The Capital Adequacy Ratio (CAR) shows how well a bank can handle financial hits. It's found by dividing all the bank's money it can use for emergencies by the risky stuff it's invested in. A higher CAR means the bank's got more cash to handle losses, making it safer from going bust (Wang et al., 2023).

Non-performing Loans

Credit risk refers to the potential loss associated with borrowers who are unable or unwilling to fully repay the borrowed funds either at the agreed-upon maturity date or in the future (Mukaromah & Supriono, 2020). Credit risk, or default risk, identified in another study (Dayana & Untu, 2019) results from borrowers' inability to repay their loans to a company within the agreed-upon time frame, including interest obligations.

Financial Performance

The financial well-being of a company is evident in its financial documents—balance sheets, income statements, and cash flow statements—which evaluate its financial performance. As stated by the Indonesian Institute of Accountants (IAI) in PSAK No. 1 of 2015, financial statements provide an organized overview of a company's financial status and achievements (Purwanti, 2021).

Cost Efficiency

Cost efficiency denotes a company's capability to attain its goals while minimizing associated expenses. It is a measure of how well a company is able to manage its resources to achieve its goals while keeping costs low. In other words, cost efficiency is about maximizing output while minimizing input costs (Marjohan, 2020).

Conceptual Framework and Hypothesis Development

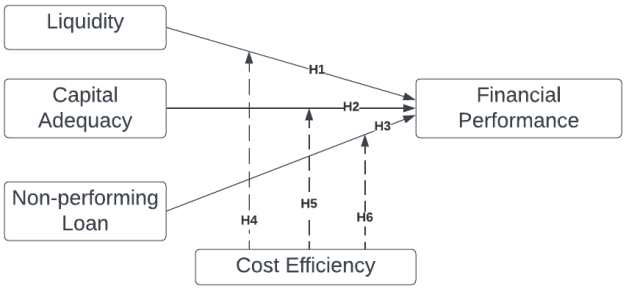

Figure 2. Conceptual Framework

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1. Liquidity and Financial Performance

Liquidity positively impacts performance in Bangladesh and Jordan, but negatively affects profitability in Indonesia (Yeasin, 2023); (Airout et al., 2023); (Wahyudi, 2023).

H1: Liquidity significantly affects financial performance.

2. Capital Adequacy and Financial Performance

Capital adequacy positively impacts performance in Pakistan but negatively in Nigeria (Sunardi & Tatariyanto, 2023) (Hussain & Rasheed, 2022).

H2: Capital adequacy significantly affects financial performance.

3. Non-Performing Loans (NPL) and Financial Performance

NPL negatively impacts profitability in Greece but shows mixed effects on ROA in Indonesia and Yemen (Diakomihalis & Economakou, 2021); (Yuhasril, 2019); (Zaid & Khan, 2022)

H3: NPL significantly affects financial performance (ROA).

4. Cost Efficiency Moderation

- Cost efficiency moderates the effects of liquidity, capital adequacy, and NPL on financial performance (Yeasin, 2023); (Wahyudi, 2023); (Shittu & Abdulkadir, 2023); (Larashati & Badjuri, 2022).

H4: It is Expect Cost Efficiency to Moderate the Effect of Liquidity on Financial Performance.

H5: It is suspected that cost efficiency can moderate the effect of capital adequacy on financial performance.

H6: It is suspected that cost efficiency can moderate the effect of non-performing loans on financial performance.

METHOD

This study delves into the relationship of the banking sector, specifically focusing on the interplay between liquidity, capital adequacy, non-performing loans, and financial performance. Spanning the five years from 2018 to 2022, it aims to shed light on how these key factors influence the overall health and efficiency of banks.

Table 1. Variable measurement

Variable	Measurement	Scale
Liquidity (X1)	LDR = $\frac{Credit}{Third\ Party\ Funds}\ x\ 100$	Ratio
Capital Adequacy (X2)	CAR = $\frac{Capital}{RWA}\ x\ 100$	Ratio
Non-Performing Loans (X3)	NPL = $\frac{Non-Performing\ Loans}{Total\ Credit}\ x\ 100$	Ratio
Financial Performance (Y)	ROA = $\frac{Profit\ before\ Tax}{Average\ total\ assets}\ x\ 100$	Ratio
Cost Efficiency (Z)	BOPO = $\frac{Operating\ Costs}{Operating\ Income}\ x\ 100$	Ratio

Sources : (Sobariah et al., 2020)

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The data collected includes the various numbers and traits found within the population. Researchers choose samples purposefully, selecting based on specific criteria outlined in Table 2.

Table 2. Research Sample Criteria

No	Criterion	Accumulation
1	Populations are banking firms that are publicly traded on the Indonesia Stock Exchange (IDX) and remained listed throughout the research timeframe spanning from 2018 to 2022.	46
2	Banking Company and does not have a sufficient level of Low Capital in the 2018-2022 Period.	(11)
3	Banking Company and do not have credit that problematic in the period 2018-2022	(7)
4	Banking Company and has no operational costs Company in the period 2018-2022	(8)
Total Samples/ year		**20**

A sample of 20 companies was selected based on predetermined criteria, resulting in 100 samples over a 5-year. Data was obtained from the Indonesian Stock Exchange website (www.idx.co.id) using observation, documentation, and literature studies. Descriptive Statistical Analysis was applied, examining the mean, standard deviation, maximum, and minimum values. Advanced statistical methods using Eviews 12 were employed with balanced panel data, combining time series and cross-sectional data. The panel data model was structured accordingly.

$Yit=\alpha+ \beta Xit+\varepsilon it$; i=1,2 ..... N; and t = 1,2 T

Where:

Y = dependent variable

X = Independent Variable is time series data

N = The number of dependent variables is cross-sectional data (number of observations)

T = Amount of time

N x H = Amount of panel data

RESULTS AND DISCUSSION

Results

Descriptive Statistical Analysis

Table 2. Descriptive Statistics of LDR, CAR, NPL, ROA and BOPO

	LDR	CAR	NPL	ROA	BOPO
Mean	0.846665	0.284117	0.013899	0.014391	0.882400
Med.	0.833050	0.217450	0.009250	0.011165	0.865000
Max.	1.630000	1.699200	0.049600	0.090986	2.611000
Min.	0.296700	0.111300	0.000000	0.000185	0.465000
Std. Dev.	0.195201	0.229673	0.011724	0.016964	0.284459
Skewness	0.681436	4.202399	1.179284	2.839891	4.355468
Kurtosis	6.297102	23.30632	3.715828	11.99518	27.37821
Jarque-Bera	53.03459	2012.447	25.31356	471.5546	2792.406

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Prob.	0.000000	0.000000	0.000003	0.000000	0.000000
Sum	84.66650	28.41170	1.389900	1.439062	88.24000
Summa Sq. Dev.	3.772248	5.222209	0.013608	0.028491	8.010802
Observations	100	100	100	100	100

From Table 2, it can be explained that:

1. Liquidity (X1), measured by LDR, varies from 0.2967 to 1,630. On average, it is around 0.8466, with a standard deviation of 0.1952.
2. Capital Adequacy (X2), measured by CAR, ranges from 0.1113 to 1.6992.
3. Non-performing loans (X3), measured by NPL vary between 0.0000 and 0.0496, with an average of approximately 0.2841 and a standard deviation of 0.0117.
4. Financial Performance, measured by ROA ranges from 0.0002 to 0.0910, with an average of 0.0143 and a standard deviation of 0.0169.
5. Cost Efficiency (Z), measured by BOPO varies from 0.4650 to 2.6110. On average, it is about 0.8824, with a standard deviation of 0.2844.

Hypoplant Test

The Hypoplant test assesses how different factors affect the value of a company by using Fixed-Effect Model regressions. It examines the significance of these factors using the t-test at a 95% confidence level (alpha = 0.05).

1. Liquidity: Significant negative impact on Financial Performance (p = 0.0345)
2. Capital Adequacy: Negative effect on Financial Performance (p = 0.0006)
3. Non-Performing Loans: No significant impact on Financial Performance (p = 0.2483)
4. Combined Effect: Liquidity, Capital Adequacy, and Non-Performing Loans together significantly affect Financial Performance (p = 0.0000)
5. Cost Efficiency as Moderator:
   - Enhances Liquidity's effect on Financial Performance (p = 0.0057)
   - Enhances Capital Adequacy's effect on Financial Performance (p = 0.0057)
   - Weakens Non-Performing Loans' effect on Financial Performance (p = 0.2106, insignificant)

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Panel Data Regression with MRA

Table 3. Panel Data Regression with MRA

Dependent Variable: ROA Method: Panel Least Squares Date: 02/30/24 Time: 15:49 Sample: 2018 2022
Periods included: 5
Cross-sections included: 20
Total panel (balanced) observations: 100

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	*0.081669*	*0.018768*	*4.351516*	*0.0000*
LDR	*-0.024183*	*0.011224*	*-2.154497*	*0.0345*
CAR	*-0.043061*	*0.011963*	*-3.599358*	*0.0006*
NPL	*-0.494581*	*0.425015*	*-1.163678*	*0.2483*
BOPO	*-0.078835*	*0.020777*	*-3.794402*	*0.0003*
LDR_BOPO	*0.031794*	*0.011162*	*2.848494*	*0.0057*
CAR_BOPO	*0.041280*	*0.011245*	*3.670975*	*0.0005*
NPL_BOPO	*0.519389*	*0.411263*	*1.262913*	*0.2106*

Effects SpecificationCross-section fixed (dummy variables)

R-squared	0.954450	Mean dependent var	0.014391
Adjusted R-squared	0.938226	S.D. dependent var	0.016964
S.E. of regression	0.004216	Akaike info criterion	-7.874401
Sum squared resid	0.001298	Schwarz criterion	-7.171005
Log-likelihood	420.7200	Hannan-Quinn criteria	-7.589724
F-statistic	58.83175	Durbin-Watson stat	2.779957
Prob(F-statistic)	0.000000		

Table 3 reveals the panel data regression equation derived from the data estimation results, the equation is as follows:

$$Y=0{,}082-0{,}024(LDR)-0{,}043(CAR)-0{,}049(NPL)-0{,}078(BOPO)+e$$

The regression equation breakdown is as follows:

1. The constant value, 0.082, signifies that when all independent variables are zero, Financial performance starts at 0.082. Any deviation from this value is due to factors not considered in this study.
2. The regression coefficient of the Liquidity variable at -0.024 indicates that for every one-unit increase in Liquidity, Financial Performance decreases by 0.024.
3. The regression coefficient of the Capital Adequacy variable at -0.043 suggests that for every one-unit increase in Capital Adequacy, Financial Performance decreases by 0.043.
4. The regression coefficient of the Non-Performing Loans variable at -0.049 means that for every one-unit increase in Non-Performing Loans, Financial Performance decreases by 0.049.
5. The regression coefficient of the Cost Efficiency variable at -0.078 indicates that for every one-unit increase in Cost Efficiency, Financial Performance decreases by 0.078.

Discussion

1. The effect of liquidity on financial performance.

The tests demonstrate that Liquidity has a substantial detrimental impact on Financial Performance. These results reinforce the conclusions drawn from earlier studies on the subject Anggraini et al. 2022); Bailusy et al. (2019). Research findings unequivocally demonstrate that Liquidity has a negative effect on financial performance. This stands in contrast to the

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conclusions drawn by (Diana & Osesoga, 2020; Perdana & Adrianto, 2020; Sunardi & Febrianti, 2020) which state that liquidity negatively affects financial performance.

Banks with high liquidity hold a lot of assets in cash or cash equivalents with low returns (Satoto et al., 2023). These assets may not generate enough income to cover costs, reducing profitability. Holding high liquidity can cause banks to miss out on investing in more profitable assets like loans. This can result in lower earnings compared to banks managing liquidity more efficiently. Very high liquidity levels may show caution from management or a lack of confidence in markets, impacting financial performance negatively.

2. The effect of capital adequacy on financial performance.

The results of the tests indicate that the Capital Adequacy Variable has a notable adverse effect on Financial Performance. This finding diverges from the research conducted by Farras Brastama & Yadnya (2020) and Indradi & Taswan (2022), which showed that maintaining higher capital adequacy ratios tends to show stronger financial performance indicators. On the other side, the existence of CAR researched by Fadlina et al., 2019; Putri & Satrio (2019) shows that CAR does not affect ROA. The results show that an increase in CAR does not automatically improve financial performance, but rather the opposite. Banks with high CAR often see lower profits because they have to keep more funds as capital reserves rather than investing or lending them out. Having a lot of capital may indicate a cautious risk management approach, which reduces risk but also limits profit opportunities (Tresnawati, 2024). This study emphasizes the need for balance in managing capital. While having enough capital is important for managing financial risks, holding too much in reserves can restrict banks' profit potential. Banks need to find the right balance in managing capital adequacy to maintain stability while also maximizing financial performance.

3. The effect of non-performing loans on financial performance.

Based on the evidence gathered, it is concluded that the Non-Performing Loans Variable does not play a significant role in determining Financial Performance. This conclusion supports Sunarto (2023) which emphasizes the adverse effect of non-performing loans on financial performance. However, in contrast with investigations carried out by (Anggraini et al., 2022; Bailusy et al., 2019; Nadillah & Muniarty, 2021) stated that non-performing loans influence financial performance. Although non-performing loans (NPL) are seen as an important indicator of credit risk, this study found no strong evidence of a direct impact on profitability. Other factors like operational efficiency, risk management, and economic conditions may play a bigger role in financial performance. The study emphasizes the importance of credit management and risk mitigation to reduce NPL. Banks should regularly assess their loan portfolios and address any potential issues early on to maintain profitability and financial stability in the long run.

4. The Effect of Liquidity on Financial Performance with Moderation of Cost Efficiency

This study demonstrates that liquidity contributes positively to financial performance, especially when moderated by cost efficiency. Analyzing data from 20 banks over five years shows that liquidity, as measured by ROA, directly enhances financial performance. Introducing cost efficiency as a moderating variable strengthens this relationship significantly. This highlights the critical role of effective cost management in optimizing the benefits of liquidity, leading to increased profitability and enhanced overall financial stability. These results highlight the importance of tight and efficient cost management as a strategy to improve

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financial performance, especially under good liquidity conditions. Overall, the effect of liquidity on financial performance can be influenced by moderating cost efficiency. Liquidity can positively affect financial performance by increasing the liquidity ratio, but it can also negatively affect financial performance by decreasing profitability and efficiency. On the other hand, cost efficiency can negatively impact financial performance by increasing costs and decreasing profitability.

5. The Effect of Capital Adequacy on Financial Performance with Cost Efficiency Moderation.

The study reveals that capital adequacy plays a significant role in influencing bank financial performance, particularly in terms of Return on Assets (ROA). Banks with higher levels of capital adequacy generally demonstrate superior financial performance. This capability is crucial as it enables banks to absorb unexpected losses and maintain stability amid economic uncertainties. In addition, cost efficiency acts as a moderating variable that strengthens the positive effect of capital adequacy on financial performance. With high-cost efficiency, banks can manage their resources more effectively, thereby maximizing the benefits of their capital adequacy. This study highlights that maintaining high levels of capital adequacy and improving cost efficiency is crucial for enhancing the overall financial performance of banks.

Studies (Goh et al., 2022; Shittu & Abdulkadir, 2023) show that the capital adequacy ratio has a positive impact on bank financial performance. Efficient cost management also helps banks address credit risk and improve profitability (Hussain & Rasheed, 2022). Banks with sufficient capital are better able to adapt to external changes, such as the global crisis and digital transformation (Ogunode et al., 2022). Overall, the results of this study emphasize the importance of maintaining adequate capital levels and managing costs efficiently to optimize financial performance in the banking industry. High capital adequacy not only enhances financial stability but also provides greater flexibility for banks to adapt to changes in the external environment while operating cost efficiency helps mitigate the negative impact of credit risk and improve return on assets.

6. The Effect of Non-Performing Loans on Financial Performance with Cost Efficiency Moderation.

The research study suggests how NPLs large as a characteristic of a bank impair its profitability by increasing operational costs while reducing interest income. Nevertheless, firms that have a competitive edge in managing costs do tend to perform better in managing NPLs as cost control and risk management is both improved. On the other, paramount cost efficiency positively correlates with a firm's financial performance but the extent of the correlation is low (-0.078 coefficient). Tolerance limits for such factors should be established by the organizations so that they can determine if the benefits of enhancing cost efficiency outweigh the detriments in overall productivity.

The effect of cost efficiency on the financial performance of a firm turns out to be industry-specific. For instance, in the chemicals sector which has narrow margins and high operating costs, cost efficiency is a crucial element of performance. Efficient management of working capital is important since excess working capital may increase overall costs and adversely affect a firm’s performance.

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CONCLUSION

This study found that high liquidity and capital adequacy improve a firm's financial performance. Firms with more cash and strong capital tend to perform better financially, while non-performing loans have no significant impact. The combination of good liquidity, capital adequacy, and few non-performing loans has a positive effect on financial performance. Cost efficiency has a negative impact on financial performance, although the effect is small. This study emphasizes the importance of effective liquidity management to avoid increasing costs.

However, this study has limitations in sample size and secondary data, and expansion of variables and methodology is needed to obtain more comprehensive results. This research can be improved by expanding a more diverse sample and adding other variables such as macroeconomic factors and risk management to obtain more comprehensive results. The use of more diverse methodologies, including qualitative and time-series analysis, may provide deeper insights.

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