



The Influence of Liquidity and Solvency on Bank Profitability: The Moderating Role of Dividend Policy

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ABSTRACT

The banking sector in Indonesia is facing significant challenges following the COVID-19 pandemic, including declining profitability, bankruptcy risks, and pressures on liquidity and solvency. The lack of research on the moderating role of dividend policy in the relationship between liquidity, solvency, and profitability is a major issue. This study aims to analyze the impact of liquidity (LDR) and solvency (CAR) on the profitability (ROA) of conventional banks listed on the Indonesia Stock Exchange (IDX) for the period 2014-2023, as well as to examine the role of dividend policy (DPR) as a moderating variable. Using a quantitative approach, secondary data from Refinitiv Eikon and financial reports of 22 banks with 175 observations will be analyzed through moderation regression analysis (MRA) using STATA. The results show that liquidity (LDR) has a negative and insignificant effect on ROA, while solvability (CAR) has a positive and significant effect. Dividend policy (DPR) does not moderate the relationship between liquidity or solvability and profitability. These findings emphasize the importance of capital adequacy for profitability, support signaling theory, but indicate the need for an evaluation of liquidity strategies. Dividend policy is not proven to be a moderating mechanism, suggesting that banks should prioritize capital management and regulators should consider contextual factors in dividend policy.

Keywords: Liquidity, Solvency, Profitability, Dividend Policy, Banking, Indonesia

JEL Classifications: G21, G32

1. INTRODUCTION

The economy and the financial stability of the country are greatly influenced by the banking industry. Banks serve as a middleman between those who have extra money and people who don't. Through the provision of credit and various transaction services, banking facilitates economic activity while maintaining the balance of the financial system (Lestari, 2021; Olszak and Kowalska, 2023). But from 2014 to 2023, this industry has had several difficulties including lowering credit costs, fierce rivalry pushing technology innovation, and credit allocation optimization. Among these difficulties, the development of fintech has also helped to increase banking service quality and enhance human resource efficiency (Khan et al., 2025; Liu and Zhao, 2024).

The COVID-19 epidemic has severely taxed the banking sector (O'Donnell et al., 2024). Pandemic economic uncertainty produced a liquidity build-up that affected profitability and raised bankruptcy risk. A rise in non-performing loans and the necessity to have a good capital ratio further taxed bank solvency. The declining profitability shows in the deteriorating Return on Assets (ROA) and Return on Equity (ROE), therefore restricting bank expansion. In-depth research is fundamental to conserve the immovability of the banking sector among economic dynamics by means of the interplay between liquidity, solvency, and profitability (Apergis, 2024; Bai et al., 2024; Nguyen, 2020; Nianty et al., 2023; Riyanti et al., 2025).

To understand how the pandemic affected the financial performance of banks, data from the Financial Services Authority

of Indonesia (OJK) provides a real picture. OJK data shows that the Capital Adequacy Ratio (CAR) of conventional commercial banks increased from 19.57% in 2014 to 27.75% in 2023. The Loan to Deposit Ratio (LDR) briefly rose from 89.42% in 2014, fell to 82.54% in 2020, and then rose again to 84.11% in 2023. ROA experienced fluctuations, decreasing from 2.85% in 2014 to 1.59% in 2020, and then increasing to 2.78% in 2023. This pattern reflects the significant challenges faced by the banking industry during the pandemic.

Profitability is basic criteria for measurement of banks in an environment of uncertainty (Ayoush et al., 2021). Profitability is the sign of bank's efficiency in the management of resources and financial obligations (Khan and Niazi, 2024), and it is also a significant measure of stability of the banking sector (Vu and Ngo, 2023). Profitability can be affected by several factors such as efficiency, margin and the economic cycle (Lamothe et al., 2024). Another pair of internal factors are the liquidity and solvency. Liquidity allows banks to satisfy their short-term liabilities and to operate smoothly, which is also a source of profitability (Lu and Wang, 2023). Solvency reflects a bank's capacity to satisfy long-run commitments as well as retain a good balance sheet structure necessary to save face for investors (Falavigna and Ippoliti, 2021).

Apart from internal elements like solvency and liquidity, dividend policy also strategically supports bank financial situation. Apart from giving investors a good indication on the stability and long-term prospects of the bank, a regular dividend policy helps to control the link among liquidity, solvency, and profitability. Within Indonesia, dividend policy is said to be either able to increase or reduce the effect of solvency and liquidity on bank profitability (Duqi et al., 2020; Silitonga, 2024).

Prior study provided mixed evidence on the upshot of solvency and liquidity on profitability. At international level, Abdallah and Bahloul (2024) discovered positive impacts of liquidity, solvency, and asset quality as moderating variables on Tunisian banks profitability. Zaidan et al. (2022) observed positive significant connection among liquidity and profitability in Jordanian banks and negative significant impact of solvency on profitability, along with lack of moderation effect of net income between liquidity risk and profitability. In the United States, Batrancea (2021) stated that the liquidity ratio and debt-to-equity ratio significantly affect corporate performance. Khan and Niazi (2024) in India discovered that efficiency and solvency positively influence profitability, whereas liquidity and the debt equity ratio have a negative impact. Conversely, Ayoush et al. (2021) reported that liquidity and solvency do not affect profitability in Jordan, while leverage has a negative impact. Nawayiseh et al. (2024) found that liquidity significantly influences the profitability of Jordanian banks.

In Indonesia, Gunanta et al. (2022) state that liquidity and solvency affect bond ratings in the construction, real estate, and property sectors. Nugraheni and Kusumawati (2023) found that liquidity, activity, profitability, and dividend policy do not have an influence on stock returns. Ebrahim (2023) reported that positive stock liquidity influences dividend policy, particularly in corporations

with a high level of information asymmetry, indicating the potential of dividend policy as a moderation mechanism.

Although many studies discuss the influence of liquidity and solvency on profitability, research examining the part of dividend policy as a moderating variable in the Indonesian banking sector remains limited. The scarcity of such research constrains understanding of how dividend policies can optimize banks' financial strategies amidst Indonesia's economic dynamics, particularly throughout the COVID-19 pandemic. This study introduces a novel perspective by examining how dividend policy interacts using panel data collected between 2014 and 2023 from banking institutions registered on the Indonesia Stock Exchange (IDX). This approach provides a comprehensive overview of the dynamics and challenges within the banking sector.

This study is to assess the influences of liquidity and solvency on the profitability of banks listed on the IDX throughout the period of 2014-2023 as well as the part of dividend policy as a moderating factor based on this backdrop. Knowing the function of dividend policy helps one to maintain financial stability amid crises. The research results should guide authorities in developing balanced dividend policies, assist practitioners in best managing liquidity and solvency, and enhance the scholarly body of comprehension on the financial dynamics of banks in Indonesia confronting dynamic economic conditions.

2. LITERATURE REVIEW AND HYPOTHESIS FORMULATION

2.1. Agency Theory

Jensen and Meckling (1976) agency theory defines the agency correlation as a contract among the principal (shareholders) and the agent (manager). Under this arrangement, the agent has decision-making power given by the principal to run the business. Agency conflicts resulting from the two parties' misalignment might especially arise when the agent works in their personal interests instead of optimizing the company's value. Meant at matching the interests of both parties, this conflict might result in the development of agency costs including monitoring expenses and incentive provisions (Fama and Jensen, 1983).

In the context of banking, a complicated organizational structure supports potential of agency conflicts. While shareholders want best money allocation to increase profitability, bank managers often keep high degrees of liquidity to reduce personal risk (Cont et al., 2020). However, excessive liquidity can diminish opportunities for profitable investments. Conversely, a low solvency level risks incurring pressure from creditors and exacerbating conflicts between managers and shareholders (Amaral, 2024).

Dividend policies serve as a mechanism to reduce agency conflicts. Consistent dividend payments limit the discretion of managers in utilizing funds unproductively, ensuring a more efficient allocation of resources and enhancing shareholder confidence (Duqi et al., 2020). Furthermore, in conditions of weak regulatory oversight, dividend policies can prevent financial statement manipulation,

ultimately supporting the financial performance of banks (Bisetti, 2024).

2.2. Signal Theory

The signal theory established by Ross (1977) states that management uses financial decisions, such as dividend policies, to convey signals about the monetary strength of the corporation to the market regarding the company's financial condition. These signals must be credible enough to prevent them from being imitated by companies with poor financial performance (Spence, 1973).

In the banking industry, dividend policy, liquidity, and solvency serve as key indicators in conveying signals about the stability and performance of the company to investors. Bhattacharya (1979) emphasizes that consistent dividend payments reflect the presence of productive assets and the bank's ability to generate profits. This provides a more reliable signal compared to financial statements that may be subject to manipulation (Olmo et al., 2021).

Adequate liquidity reveals a bank's ability to encounter short-term obligations and address economic uncertainties, thereby reinforcing signals of profitability stability (Amaral, 2024). However, overly stringent liquidity regulations may restrict credit distribution and potentially diminish profits (Sundaresan and Xiao, 2024). Furthermore, a high solvency level indicates the resilience of a bank's capital and enhances market confidence (Falavigna and Ippoliti, 2021). Consistent dividend payments reinforce positive signals, ultimately increasing the bank's appeal to investors and supporting long-term profitability (DeYoung and Jang, 2023).

2.3. Liquidity and Bank Profitability

Research on the connection among liquidity and profitability in banks shows varied results. Some researches find a positive correlation, such as Adelopo et al. (2021) in banks within the European Union, Thinh et al. (2022) in Vietnam, and Khatri (2020) in Nepal, Trung (2021) in Vietnam, and Isayas (2022a) in Ethiopia. In Indonesia, Hasmiyana et al. (2022) also discovered a positive connection among LDR and profitability.

Furthermore, Veeramoothoo and Hammoudeh (2022) concluded that the influence of liquidity on profitability is significant across most quantiles of banks in the United States, with liquidity risk varying based on the size of the bank. Majeed and Zainab (2021) emphasized the importance of a strong liquidity position in managing failure risk.

However, several other studies have found contrary results. Budhathoki et al. (2020) reported that a high LDR tends to reduce profitability. Pak (2020) revealed that an upsurge in liquidity can decrease the Net Interest Margin (NIM) in systematic banks. Hunjra et al. (2022) analyzed commercial banks in Sri Lanka, Bangladesh, India, Pakistan and by employing the Generalized Method of Moments (GMM) as their analytical framework, finding a substantial negative influence of LDR on profitability. Radovanov et al. (2023) also identified an inverse correlation among the LDR and the profitability of commercial banks—assessed through ROA and ROE—in the Western Balkan region.

Meanwhile, Jigeer and Koroleva (2023) in China and Zhao et al. (2022) in the banking and fintech sector did not find a significant impact of liquidity on profitability, which may be influenced by strict regulations and high confidence in the banking system. Ozili and Ndash (2024) concluded that the impact of LDR on profitability is not always significant or consistent, as observed in the banking context of Nigeria during the period of 2004-2005.

According to agency theory, bank managers acting as agents tend to prefer high liquidity policies to reduce the risk of short-term failures. Adequate liquidity can alleviate pressure from shareholders and provide flexibility in carrying out daily operational activities. Thus, agency conflicts can be minimized and managerial decisions become more efficient. This situation can support the improvement of the bank's profitability, as the availability of sufficient funds allows for lending and more optimal management of current assets.

H₁: Liquidity has a positive impact on bank profitability.

2.4. Solvency and Bank Profitability

Several studies have demonstrated that solvency, as measured by the CAR, affects the profitability of banks. Saif-Alyousfi (2022) in Asia, Yusditasari et al. (2023) in Indonesia, Nguyen (2020) in Vietnam, and Isayas (2022a) in Ethiopia have stated that CAR has a positive and substantial impact on profitability as measured by ROA, ROE, and NIM. Banks with adequate capital are more confident in taking risks and expanding their operations. Radovanov et al. (2023) reveal that CAR positively influences the profitability of commercial banks in the West Balkan region, supported by Al-Sharkas and Al-Sharkas (2022) in Jordan. Sang (2021) in Vietnam highlighted the positive correlation between CAR and financial stability, supporting sustainable profitability.

However, Madugu et al. (2020) in Ghana, Awwad (2023) in Palestine, and Hawaldar et al. (2022) in Indonesia found a negative correlation among CAR and profitability, reveal that excessive capital can hinder banks from productively channeling funds. Haris et al. (2020) in Pakistan identified an inverted U-shaped correlation among CAR and profitability, suggesting that an increase in CAR is beneficial up to a certain point before it diminishes profitability.

Meanwhile, Nakaa (2024) in Aljazair, Gupta and Sikarwar (2020) in India, Chhaidar et al. (2023) in Eropa, and Jigeer and Koroleva (2023) in China did not find a substantial correlation among CAR and profitability. These findings indicate that other factors or country-specific conditions limit the influence of CAR.

In the framework of signal theory, managers use the capital structure as a tool to convey the company's internal information to external parties. A high solvency level serves as a positive signal for investors and creditors regarding the stability and financial strength of the bank. Banks with a strong CAR are considered more capable of absorbing risks and expanding their operations through the disbursement of credit, which will ultimately enhance the company's profits.

H₂: Solvency has a positive effect on bank profitability

2.5. Dividend Policy Moderates Liquidity on Bank Profitability

Zelalem and Abebe (2022) in Ethiopia indicate that profitability and liquidity significantly influence bank dividend policies. Takmaz et al. (2020) at Borsa Istanbul found that profitable companies with high liquidity are more capable of meeting their short-term obligations and distributing dividends.

Al-Fasfus (2020) in Jordan discovered that liquidity has a significant positive correlation with the Dividend Payout Ratio (DPR), allowing banks with strong liquidity greater flexibility in their dividend policies. In Indonesia, Tinungki et al. (2022) showed that profitability significantly enhances dividend policies among public companies listed on the IDX. Kautsar et al. (2023) found that liquidity not only directly affects dividend policies but also moderates the relationship between profitability and dividend policies, although the effect is not always consistent.

In the perspective of agency theory, dividend policy is one of the mechanisms of managerial control. Consistent dividend payments limit the inefficient use of funds by management and direct the remaining profits towards more selective and productive investments. When banks have high liquidity accompanied by a stable dividend policy, it can strengthen the impact of liquidity on profitability through the efficient use of resources.

H₃: Dividend policy strengthens the effect of liquidity on bank profitability

2.6. Dividend Policy Moderates Solvency on Bank Profitability

Budagaga (2020), in the context of the MENA region, indicates that banks with high CAR and ROE are likely to distribute dividends, reflecting a strong financial position and managerial flexibility. In Indonesia, Setiawan et al. (2024) found that ROA and CAR have a positive influence on DPR, signifying that banks with good performance have the discretion to determine dividend policies due to lower regulatory pressure.

Conversely, Silalahi et al. (2021) indicating that the relationship between solvency and dividend policy can be contextual, depending on the bank's strategy and capital market conditions. Athari (2020) in Nigeria emphasizes the importance of profitability as a key determinant of dividend policy, while research by Akhmadi and Januarsi (2021) shows that dividend policy can strengthen the relationship between profitability and firm value. Studies by Bossman et al. (2022) and Al-Omari et al. (2024) also found that dividend policy can moderate the effect of profitability on financial performance.

According to signal theory, dividends consistently distributed by banks with high solvency send a positive signal to investors that the bank is not only capable of meeting minimum capital requirements but also has a capital surplus and stable financial prospects. This signal can enhance market confidence, strengthen the bank's reputation, and ultimately encourage an increase in long-term profitability.

H₄: Dividend policy strengthens the effect of solvency on bank profitability

Based on the hypotheses developed, the thinking framework illustrates the relationship between liquidity, solvency, and bank profitability. As shown in Figure 1, dividend policy is expected to moderate the effect of liquidity and solvency on bank profitability.

3. RESEARCH METHODOLOGY

Using a quantitative method, this research investigates the impact of liquidity and solvency on bank profitability, with dividend policy serving as a moderating factor in the relationship. Secondary data are taken from Refinitiv Eikon and annual report of conventional banks listing in IDX (the period of 2014-2023). Choosing the banking sector as the object of study is due to the position of the banking industry which is able to maintain the stability of the financial system as well as supporting the growth of economy (Lestari, 2021).

We narrow our study to conventional banks to have homogeneous data. Islamic banks were excepted from the analysis because of their inherent differences in operations features, financial products and regulatory environments compared with those of conventional banks (Majeed and Zainab, 2021; Péran and Sdiri, 2024). This research targets all conventional banking institutions that have been publicly listed on the IDX as its population. Purposive sampling technique (Hasmiana et al., 2022; Setiawan et al., 2024) was used with the following criteria: (1) listed banks in the IDX from 2014 to 2023, (2) dividend-paying or have data on dividend policy are available, (3) complete data of research variables, which include liquidity, solvency, profitability, and dividend policies, and (4) categorized as conventional bank. The sample sizes were 22 banks and 175 observations, extracted from the selection process. The reduction of the observations from the sample's maximum number (220) results from the unavailability of complete and reliable data for all the years of thought in some banks.

This research has used multiple regression in the analysis so that it can determine the simultaneous impacts of independent and control variables on bank profitability, which is possible to amount the direction and the degree of the effects of many variables simultaneously (Budhathoki et al., 2020). In addition, moderated regression analysis (MRA) is employed to investigate whether dividend policy, as a moderating factor, has an influence the link between liquidity and solvency with profitability, assessing the difference in the quantity of prediction of the dependent variable across different levels of moderation (Edwards and Konold, 2020). All statistical analyses were conducted using the STATA statistical program.

Multiple regression analysis model:

$$ROA = \beta_0 + \beta_1 LDR + \beta_2 CAR + \beta_3 SIZE + \beta_4 GDP + \beta_5 INFL + \epsilon$$

Moderated regression analysis model:

$$ROA = \beta_0 + \beta_1 LDR + \beta_2 CAR + \beta_3 DPR + \beta_4 (LDR \times DPR) + \beta_5 (CAR \times DPR) + \beta_6 SIZE + \beta_7 GDP + \beta_8 INFL + \epsilon$$

Description:

ROA: Indicates the profitability of the bank

LDR and CAR: Indicates financial ratios

DPR: Indicates the dividend policy ratio as moderation

SIZE, GDP, and INFL: Indicates control variables

3.1. Dependent Variable

ROA is taken as the dependent variable, because it is an indicator of profitability by which resources are efficiently used. This could be achieved using the ratio of net income to total assets (Abdallah and Bahloul, 2024; Banto and Monsia, 2021).

3.2. Independent and Moderating Variables

Liquidity is the first variances. The bank's degree of debt and short-term obligation payment preparedness on a certain date defines this variable. Important indicator of financial liquidity, LDR helps banks to evaluate their financial situation (Abdallah and Bahloul, 2024; Hasmiana et al., 2022; Lu and Wang, 2023; Majeed and Zainab, 2021).

Solvency is the second factor. Solvency in the context of banks is their capacity to satisfy long-term liabilities. A bank's solvency is greatly enhanced by CAR. Using this ratio can help banks to guarantee their financial stability and prevent financial shocks (Abdallah and Bahloul, 2024; Falavigna and Ippoliti, 2021; Isayas, 2022a; Sang, 2021).

DPR is a measure of the moderating variable of the dividend policy. The ratio indicates the percentage of earnings paid out as dividends to shareholders (Al-Omari et al., 2024; Bossman et al., 2022; Linh et al., 2024).

3.3. Control Variables

The bank's size, which is determined by taking the natural log of its total assets and adding macroeconomic factors like GDP and INFL. GDP has been used in the majority of empirical studies to evaluate how economic circumstances affect banking performance and activity. When prices generally increase and economic agents' buying power declines, this is known as inflation (INFL) (Abdallah and Bahloul, 2024; Ahmed et al., 2023). Table 1 recaps all variables.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Table 2 reveal the descriptive statistics corresponding to the variables utilized in this research. ROA has a minimum value of -5.2, a maximum value of 4.73, and a mean of 2.112 with a standard deviation of 1.225. LDR displays a minimum value of 51.38, a maximum value of 163, and a mean of 88.507 with a standard deviation of 18.187. CAR ranges from a minimum of 10.44 to a maximum of 49.93, with a mean of 22.345 and a standard deviation of 6.044. DPR has a mean of 32.517, a minimum of 0, a maximum of 117.91, and a standard deviation of 23.405. SIZE ranges from a minimum of 28.62 to a maximum of 35.32, with a mean of 32.363 and a standard deviation of 1.678. The GDP data indicates a mean of 4.326, a minimum of -2.1, a high of 5.3, and a standard deviation of 1.678. A mean of 3.632, a

standard deviation of 1.892, a minimum of 1.68, and a maximum of 8.36 are all characteristics of INFL.

4.2. Model Selection Test

The Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) are the three methodologies used to assess the selection of the optimal model for panel data analysis. The findings are exposed in Table 3. With a probability value of 0.000 ($P < 0.05$) according to the Chow test, FEM is deemed more suitable than CEM. The Hausman test then reveal

Table 1: Definition of variables

Variables	Abbreviation	Formulas
Dependent variable		
Loan to deposit ratio	LDR	Loan/deposit
Capital adequacy ratio	CAR	Capital adequacy
Independent variables		
Return on assets	ROA	Net income/total assets
Moderating variables		
Dividend payout ratio	DPR	Dividend per share/ earnings per share
Control variables		
Bank size	SIZE	Natural log (Total assets)
GDP growth	GDP	Log real GDP per capita
Inflation rate	INFL	$[(CPI_t - CPI_{t-1})/CPI_{t-1}] \times 100$

Source (s): Authors' own work

Table 2: Descriptive statistics

Variable	n	Mean	Standard Deviation	Min	Max
ROA	175	2.1126	1.2258	-5.2	4.73
LDR	175	88.5073	18.1874	51.38	163
CAR	175	22.3452	6.0447	10.44	49.93
DPR	175	32.5176	23.4057	0	117.91
SIZE	175	32.3637	1.6788	28.62	35.32
GDP	175	4.3268	2.0123	-2.1	5.3
INFL	175	3.632	1.8920	1.68	8.36

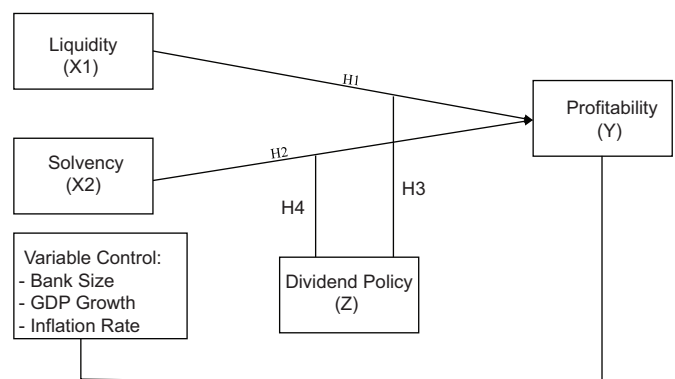
Source (s): Authors' own work

Table 3: Model selection test

Model selection test	P-value
Chow test	0.0000
Hausman test	0.0009
Lagrange multiplier test	1.0000

Source (s): Authors' own work

Figure 1: Thinking framework



that FEM is better than REM, with a probability value of 0.000 ($P < 0.05$). CEM is better fitting than REM, according to the Lagrange Multiplier (LM) test, which yields a probability value of 1 ($P > 0.05$). FEM continuously shows itself to be the best model for the data in this investigation based on the outcomes of these three tests.

4.3. Classical Assumption Test

The fallouts of the classical assumption tests indicate that the normality test yields a probability value of $0.261 > 0.05$, suggesting that the residual data follows a normal distribution. The multicollinearity test uncover that the VIF values of all independent variables are <10 , indicating no multicollinearity. However, the heteroskedasticity test with a probability value of $0.043 < 0.05$ indicates the presence of heteroskedasticity in the residual data, which can be addressed with a fixed effect model. Additionally, the autocorrelation test with a probability value of $0.000 < 0.05$ designates the presence of autocorrelation in the residual data, which can also be handled with a fixed effect model.

4.4. Hypothesis Test

With a significance threshold of $0.000 < 0.05$, the F test results are displayed in Table 4, demonstrating that the regression model is appropriate for usage and that the independent variables (LDR, CAR, SIZE, GDP, and INFL) significantly affect ROA at the same time. With an Adjusted R-squared value of 0.431, these variables account for 43.1% of the variation in ROA, with additional factors outside the model influencing 56.9%.

Table 5 displays the fallouts of the F-test with a significance of $0.000 < 0.05$, indicating that the regression model is suitable for use, with the independent variables (LDR, CAR, the interaction of LDR with DPR, the interaction of CAR with DPR, SIZE, GDP, and INFL) being simultaneously significant to ROA. The Adjusted R-squared value of 0.433 designates that 43.3% of the variation in ROA is elucidated by the model, while 56.7% is prejudiced by other variables outside the model. This small increase indicates the contribution of the moderating variables.

4.5. Panel Data Regression Model

$$\text{ROA} = -7.132 - 0.077 \text{ LDR} + 1.074 \text{ CAR} + 3.881 \text{ SIZE} + 0.270 \text{ GDP} + 0.225 \text{ INFL}$$

Grounded on the regression outcomes obtainable in Table 6, the liquidity variable measured using the LDR shows a negative but insignificant effect on bank profitability (ROA), with a coefficient of -0.077 and a P-value of $0.583 (>0.05)$. This indicates that the first hypothesis is rejected. In other words, changes in the liquidity level do not significantly affect the level of bank profitability in this research sample.

This finding does not support the agency theory, which states that adequate liquidity can reduce agency conflicts between management and owners, provide managerial discretion in daily operations, and improve asset management efficiency, ultimately expected to drive profitability. Theoretically, banks with optimal liquidity levels should be able to smoothly perform their intermediation functions and enhance investor confidence as

Table 4: Simultaneous test and coefficient of determination of regression model without moderation

Statistic	Value
Number of observations	175
F (5.169)	27.45
Prob>F	0.0000
R-squared	0.4481
Adj R-squared	0.4318
Root MSE	0.1510

Source (s): Authors' own work

Table 5: Simultaneous test and coefficient of determination of regression model with moderation

Statistic	Value
Number of observations	175
F (7.167)	19.98
Prob>F	0.0000
R-squared	0.4558
Adj R-squared	0.4330
Root MSE	0.1509

Source (s): Authors' own work

well as financial stability. However, in the context of this research, liquidity management appears to be insufficiently effective in translating into profitability improvements.

These outcomes are in line with several earlier researches such as Budhathoki et al. (2020), Jigeer and Koroleva (2023), Zhao et al. (2022), and Ozili and Ndah (2024) which discovered that liquidity has a negative or insignificant effect on profitability. Several factors mentioned that influence the weak contribution of liquidity to bank profits include high credit risk, conservative cash management strategies, and inefficiencies in fund distribution.

Nevertheless, these results are contrary to the outcomes of Adelopo et al. (2021), Isayas (2022a), Khati (2020), Thinh et al. (2022), Trung (2021), and Hasmiana et al. (2022), who found that high liquidity positively contributes to profitability by providing operational flexibility, meeting short-term obligations, and creating short-term investment opportunities. The dissimilarities in these outcomes may be recognized to disparities in banking structures, managerial efficiency, and macroeconomic conditions in each country or study period.

Meanwhile, CAR shows a positive and significant influence on ROA with a coefficient of 1.074 and a P-value of $0.000 (<0.05)$. Therefore, the second hypothesis is recognized. This designates that the higher the level of the bank's capital adequacy, the larger the level of profitability generated.

This finding is consistent with signaling theory, which posits that a high CAR provides positive signals to stakeholders regarding the stability and financial strength of a bank. A high CAR indicates that the bank has sufficient capacity to absorb risks, maintain investor confidence, and comply with regulatory requirements. Banks with strong capitalization also tend to have a competitive advantage in credit expansion, risk management, and long-term financial stability, ultimately leading to increased profitability.

This study is in line with the outcomes of Saif-Alyousfi (2022) in Asia, Yusditasari et al. (2023) in Indonesia, Nguyen (2020) in Vietnam, and Isayas (2022a) in Ethiopia. Additionally, Radovanov et al. (2023) in Balkan region and Al-Sharkas and Al-Sharkas (2022) in Jordan also demonstrate that a high CAR enhances market confidence and reflects a bank's ability to bear financial risks.

However, there are also studies indicating that excessively high capital can negatively impact profitability. Madugu et al. (2020) in Ghana, Awwad (2023) in Palestina, and Hawaldar et al. (2022) in Indonesia argue that a high CAR may reflect idle, unproductive funds and lead to lower effectiveness in credit distribution, especially in uncertain conditions such as the COVID-19 pandemic. Nevertheless, overall, the findings of this study reinforce the view that healthy capital adequacy is one of the imperative determinants of banking profitability.

$$\text{ROA} = -7.103 + 0.137 \text{ LDR} + 0.846 \text{ CAR} - 0.127 \text{ LDR} * \text{DPR} + 0.197 \text{ CAR} * \text{DPR} + 3.764 \text{ SIZE} + 0.283 \text{ GDP} + 0.227 \text{ INFL}$$

According to the regression outcomes in Table 7, the interaction between LDR and DPR shows a coefficient of -0.127 with a P-value of $0.194 (>0.05)$. This designates that the DPR variable is unable to moderate the correlation among liquidity and profitability (ROA), thus the third hypothesis is rejected.

This finding contradicts agency theory, which states that dividend policy can strengthen the positive relationship between liquidity and profitability. According to this theory, dividends serve as a control mechanism to encourage management to manage funds efficiently and reduce conflicts of interest. Theoretically, when banks have high liquidity and implement a consistent dividend policy, management will be more prudent in using cash, thereby increasing efficiency and profitability. However, in the context of this research, this mechanism does not appear to be functioning effectively.

This outcome is also inconstant with the research of Kautsar et al. (2023) and Al-Fasfus (2020), which found that liquidity can strengthen the correlation among profitability and dividend policy. In their studies, banks with high liquidity were deemed more capable of paying dividends and maintaining financial performance. Conversely, the outcomes of this study provision the view that the correlation among liquidity, dividend policy, and profitability is contextual and not always consistent. Differences in liquidity conditions among banks may influence the power of this moderating effect. Therefore, dividend policy does not universally strengthen the correlation among liquidity and profitability, depending on the characteristics and strategies of each bank.

Furthermore, the interaction between CAR and DPR also shows insignificant results, with a coefficient of 0.197 and a P-value of $0.169 (>0.05)$. This implies that dividend policy does not moderate the correlation among a bank's solvency and profitability, thus the fourth hypothesis is rejected.

This finding does not support the signaling theory, which explains that banks with high and consistent solvency levels that distribute dividends send positive signals to investors regarding their financial strength and company prospects. Such signals should lower capital costs and enhance market confidence, ultimately driving profitability increases. However, in the context of this research, these signals appear to be insufficiently strong or not completely trusted by the market, thus failing to provide a significant moderating impact on the relationship between CAR and ROA.

Empirically, these results are not aligned with the findings of Akhmadi and Januarsi (2021), Bossman et al. (2022), and Al-Omari et al. (2024), which state that dividend policies can strengthen the correlation among profitability and company performance through increased market confidence and reduced agency conflicts. However, these outcomes are steady with the study Silalahi et al. (2021), which found that CAR does not

Table 6: Regression model and t-test without moderation

ROA	Coefficient	Standard error	t	P> t	[95% Conf. Interval]
LDR	-0.0772	0.1405	-0.55	0.583	-0.3546 0.2002
CAR	1.0747	0.1146	9.38	0.000	0.8484 1.3010
SIZE	3.8818	0.5217	7.44	0.000	2.8517 4.9119
GDP	0.2703	0.1303	2.07	0.040	0.0129 0.5277
INFL	0.2251	0.0782	2.88	0.005	0.0706 0.3797
_CONS	-7.1325	0.9172	-7.78	0.000	-8.9433 -5.3217

Source (s): Authors' own work

Table 7: Regression model and t-test with moderation

ROA	Coefficient	Standard error	t	P> t	[95% Conf. Interval]
LDR	0.1379	0.2046	0.67	0.501	-0.2661 0.5421
CAR	0.8463	0.1955	4.33	0.000	0.4603 1.2323
LDR_CAR	-0.1270	0.0975	-1.30	0.194	-0.3195 0.0654
CAR_DPR	0.1975	0.1428	1.38	0.169	-0.0845 0.4795
SIZE	3.7649	0.5427	6.94	0.000	2.6933 4.8364
GDP	0.2836	0.1305	2.17	0.031	0.0259 0.5414
INFL	0.2274	0.0782	2.91	0.004	0.0729 0.3818
_CONS	-7.1038	0.9379	-7.57	0.000	-8.9556 -5.2520

Source (s): Authors' own work

significantly affect DPR in Indonesia. One of the reasons for this is the regulation from Bank Indonesia regarding the minimum CAR, which limits banks' flexibility in determining dividend policies.

Nevertheless, the positive direction of the interaction coefficient is steady with the outcomes of Budagaga (2020) and Setiawan et al. (2024), who concluded that banks with high CAR levels are more likely to distribute large dividends. However, in the present study, it has not been proved that the intended moderating effect of dividend policy can work an essential part in increasing the effect of bank solvency on profitability.

The control variables, SIZE, GDP, and INFL have positive and significant effect on ROA. This suggests that internal and macroeconomic bank factors have a significant influence on bank performance. The outcomes on SIZE and GDP support the study of Abdallah and Bahloul (2024). However, the favorable effect of INFL is in contrast to Ahmed et al. (2023).

5. CONCLUSION

Results in the previous section show that liquidity (LDR) has a negative and insignificant effect on the profitability of the bank (ROA), suggesting that changes in the bank liquidity level do not directly affect the bank's financial performance. Conversely, CAR has a positive and statistically significant impact on ROA, meaning that a high capital adequacy can have an effect on bank profitability through financial soundness and stakeholders trust. Nevertheless, dividend policy (DPR) has no significant moderating effect on the association of both liquidity and solvency with bank profitability. It follows that the dividend policy does not reinforce or weaken the effect of these two variables on ROA.

This result serves to highlight the significance of effective capital management in the improvement of banks' performance, particularly their ability to meet higher CAR requirements. For bank management, focusing on optimizing the capital structure can serve as a primary strategy to improve financial performance. However, the weak influence of liquidity indicates the need for an evaluation of asset management and credit risk strategies so that liquidity can contribute more significantly to profitability. The insignificance of dividend policy as a moderating variable suggests that banks need to consider other factors, such as operational efficiency or market conditions, when formulating their dividend policies.

The implications of this research finding encompass two main aspects. Theoretically, this research contributes to the banking finance literature. The results show that liquidity is not significant to profitability, providing a new perspective on some assumptions of agency theory, suggesting that the efficiency of liquidity management may be more crucial than merely its quantity in the context of banks listed on the IDX. On the other hand, the finding regarding the positive and significant influence of solvency (CAR) on ROA strongly supports signaling theory. However, the rejection of the moderation hypothesis of dividend policy (DPR) on the correlation among liquidity, solvency, and profitability indicates limitations in agency theory and signaling theory concerning the

role of dividends as a reinforcement mechanism, possibly due to the influence of contextual factors or regulations in Indonesia.

Meanwhile, the practical implications are highly relevant for bank management. This research emphasizes that capital adequacy (CAR) is a major aspect in enhancing profitability. Therefore, banks need to prioritize strategies to maintain and improve the CAR. Although liquidity is important, banks must also evaluate liquidity management strategies to contribute more effectively to profitability, such as by optimizing credit distribution. Finally, for dividend policymakers, these results indicate that dividend policy may not directly function as a tool to moderate the correlation among liquidity, solvency, and profitability. Banks need to consider other internal and external factors when formulating dividend policies that can support profitability objectives.

This research has limitations regarding the sample, as not all banks distribute dividends and the sample size is not substantial, thus the results do not fully reflect the conditions of the entire banking sector. Therefore, future study must investigate further sectors, such as the non-bank financial sector or the manufacturing industry, to broaden the scope and increase the sample size, as well as to investigate other moderating variables, such as corporate governance or financial innovation, to attain a more profound conception of profitability dynamics.

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