

## THE EFFECT OF LIQUIDITY, LEVERAGE, PROFITABILITY, INDEPENDENT COMMISSIONERS, AND INSTITUTIONAL OWNERSHIP ON DIVIDEND POLICY WITH FREE CASH FLOW AS A MODERATING VARIABLE IN MINING SECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE DURING THE PERIOD OF 2021 TO 2024

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### Abstract

This study aims to analyze whether liquidity, leverage, profitability, independent commissioner, and institutional ownership affect dividend policy with free cash flow as a moderating variable in mining sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2021–2024. The study employed purposive sampling, selecting 25 companies from a population of 47 mining sector firms listed on the IDX, yielding 100 observations. Hypothesis testing was conducted using panel data regression analysis and Moderated Regression Analysis (MRA) with EViews software. The results indicate that liquidity does not affect dividend policy. Leverage does not affect dividend policy. Profitability has a significant positive effect on dividend policy. Independent commissioner and institutional ownership do not affect dividend policy. Free cash flow cannot moderate the effect of leverage, profitability, or institutional ownership on dividend policy.

**Keywords:** Dividend Policy, Dividend Payout Ratio, Liquidity, Leverage, Profitability, Independent Commissioner, Institutional Ownership, Free Cash Flow, Agency Theory, Signaling Theory

### INTRODUCTION

Dividend policy in companies listed on the Indonesia Stock Exchange often exhibits varying patterns across periods and sectors, as it involves the allocation of earnings either for internal investment or distribution to shareholders. This raises questions about the key factors driving management's determination of the dividend payout ratio. Theoretically, agency conflicts between managers and shareholders influence dividend policy decisions. Dividend policy signals the financial condition and business prospects to investors (Herlina & Agustiningsih, 2024). According to Hendra & Anam (2020), dividend policy is an important financial decision that determines whether corporate earnings will be retained for operational and investment activities or distributed to shareholders.

Dividend policy in mining companies depends on regulatory requirements and industry-specific characteristics. Law Number 3 of 2020 on Mineral and Coal Mining regulates mining activities with emphasis on reserve management, reclamation, and downstream processing. To fulfill these obligations, companies must retain a portion of their earnings for sustainable investment and environmental responsibilities. Additionally, accounting standards such as ISAK 29 on land stripping costs and PSAK 64 on exploration and evaluation indicate that most costs in this sector are capitalized, increasing capital expenditure needs and affecting dividend-paying capacity. Several indicators are used to determine dividend policy: Dividend per Share (DPS), Dividend Yield, and Dividend Payout Ratio (DPR). This study uses DPR because it directly reflects management's policy decisions and is most suitable for capital-intensive industries such as mining (Herlina & Agustiningsih, 2024). The DPR measures the proportion of net earnings distributed to shareholders as dividends. Dividend policy remains one of the most important financial decisions because it reflects a firm's ability to distribute earnings while maintaining sufficient resources for future operations and investment. In the Indonesian mining sector, considerable variations in dividend payout ratios can be observed despite relatively favorable financial conditions among several firms. Such variations

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indicate that dividend policy is not determined solely by profitability or liquidity but may also be influenced by leverage, corporate governance mechanisms, and ownership structure. To illustrate this phenomenon, Table 1 presents selected mining companies listed on the Indonesia Stock Exchange in 2024.

**Table 1. Variations in Dividend Policy and Firm Characteristics among Mining Companies in Indonesia, 2024**

| No. | Company Code | 2021 | 2022 | 2023 | 2024 |
|-----|--------------|------|------|------|------|
| 1   | ADRO         | 0.63 | 0.35 | 0.43 | 0.32 |
| 2   | ANTM         | 0.50 | 0.50 | 1.00 | 0.95 |
| 3   | BSSR         | 0.87 | 1.07 | 0.83 | 0.65 |
| 4   | DOID         | 0.09 | 0.25 | 0.28 | 0.09 |
| 5   | GTBO         | 0.00 | 0.14 | 0.00 | 0.00 |
| 6   | HRUM         | 0.19 | 0.21 | 0.00 | 0.00 |
| 7   | PTRO         | 0.00 | 1.85 | 0.25 | 1.00 |
| 8   | RUIS         | 0.17 | 0.13 | 0.00 | 0.00 |
| 9   | SMMT         | 0.00 | 1.45 | 0.46 | 0.00 |
| 10  | TINS         | 0.35 | 0.30 | 0.00 | 0.40 |

*Source: Processed by the Authors (2026).*

As shown in Table 1, firms with relatively strong liquidity, profitability, and institutional ownership do not always exhibit high dividend payout ratios. For example, several companies with adequate financial performance distributed little or no dividends, whereas others maintained relatively high dividend payouts despite different financial characteristics. These inconsistencies suggest that the determinants of dividend policy remain inconclusive and warrant further investigation. Therefore, examining the roles of liquidity, leverage, profitability, independent commissioners, and institutional ownership in explaining dividend policy remains relevant, particularly in the Indonesian mining industry.

Based on the empirical observations in Table 1, there is significant instability in dividend payout ratios among mining companies listed on the IDX from 2021 to 2024. DPR values range from 0 to above 1, reflecting different strategies in distributing earnings to shareholders. The phenomenon suggests that dividend policy in Indonesian mining companies remains unstable and varies considerably across firms.

**Table 2. Dividend Payout Ratio (DPR) of Selected Mining Companies Listed on IDX, 2021–2024**

| No. | Company Code | Dividend Payout Ratio (DPR) | Current Ratio (CR) | Debt-to-Equity Ratio (DER) | Return on Assets (ROA) | Independent Commissioner | Institutional Ownership |
|-----|--------------|-----------------------------|--------------------|----------------------------|------------------------|--------------------------|-------------------------|
| 1   | ADRO         | 0.32                        | 4.02               | 0.25                       | 0.23                   | 0.40                     | 0.774                   |
| 2   | ANTM         | 0.95                        | 1.84               | 0.38                       | 0.09                   | 0.60                     | 0.862                   |
| 3   | BSSR         | 0.65                        | 1.75               | 0.45                       | 0.34                   | 0.38                     | 0.907                   |
| 4   | DOID         | 0.09                        | 1.48               | 7.20                       | -0.04                  | 0.75                     | 0.582                   |
| 5   | GTBO         | 0.00                        | 1.28               | 0.22                       | -0.06                  | 0.50                     | 0.970                   |
| 6   | HRUM         | 0.00                        | 1.87               | 0.44                       | 0.03                   | 0.67                     | 0.932                   |
| 7   | PTRO         | 1.00                        | 1.56               | 2.47                       | 0.01                   | 0.33                     | 0.880                   |
| 8   | RUIS         | 0.00                        | 1.46               | 1.52                       | 0.01                   | 0.33                     | 0.562                   |
| 9   | SMMT         | 0.00                        | 1.08               | 0.52                       | 0.03                   | 0.33                     | 0.992                   |
| 10  | TINS         | 0.40                        | 2.22               | 0.72                       | 0.09                   | 0.40                     | 0.854                   |

*Source: evIEWS 13, 2026.*

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The key variables examined in prior research include profitability, liquidity, leverage, free cash flow, firm size, and ownership structure such as managerial, institutional, and foreign ownership, as well as corporate governance mechanisms including independent commissioners. This study focuses on the effects of liquidity, leverage, profitability, independent commissioner, and institutional ownership on dividend policy, with free cash flow as a moderating variable.

Previous studies have reported inconsistent findings regarding the determinants of dividend policy. In addition, the role of free cash flow as a moderating variable remains underexplored, particularly in emerging markets. The preliminary evidence presented in Table 3 indicates substantial variation in free cash flow levels among mining companies, suggesting that the availability of internal funds may influence the relationship between firm characteristics and dividend distribution decisions.

**Table 3. Preliminary Evidence Supporting the Moderating Role of Free Cash Flow in Dividend Policy**

| No. | Company Code | Dividend Payout Ratio (DPR) | Debt-to-Equity Ratio (DER) | Return on Assets (ROA) | Institutional Ownership | Free Cash Flow |
|-----|--------------|-----------------------------|----------------------------|------------------------|-------------------------|----------------|
| 1   | ADRO         | 0.32                        | 0.25                       | 0.23                   | 0.774                   | 0.18           |
| 2   | ANTM         | 0.95                        | 0.38                       | 0.09                   | 0.862                   | 0.06           |
| 3   | BSSR         | 0.65                        | 0.45                       | 0.34                   | 0.907                   | 0.28           |
| 4   | DOID         | 0.09                        | 7.20                       | -0.04                  | 0.582                   | 0.05           |
| 5   | GTBO         | 0.00                        | 0.22                       | -0.06                  | 0.970                   | -0.13          |
| 6   | HRUM         | 0.00                        | 0.44                       | 0.03                   | 0.932                   | 0.01           |
| 7   | PTRO         | 1.00                        | 2.47                       | 0.01                   | 0.880                   | -0.11          |
| 8   | RUIS         | 0.00                        | 1.52                       | 0.01                   | 0.562                   | -0.01          |
| 9   | SMMT         | 0.00                        | 0.52                       | 0.03                   | 0.992                   | 0.05           |
| 10  | TINS         | 0.40                        | 0.72                       | 0.09                   | 0.854                   | 0.17           |

Source: *views* 13, 2026.

Table 3 demonstrates that companies with similar leverage, profitability, and institutional ownership levels may exhibit different dividend payout policies when free cash flow conditions differ. This observation indicates that free cash flow may strengthen or weaken the influence of firm-specific factors on dividend policy. Consequently, incorporating free cash flow as a moderating variable may provide a more comprehensive explanation of dividend policy decisions and help address inconsistencies reported in prior studies.

Several prior studies found significant effects; others found no significant effects; and some have not comprehensively tested the moderating role of free cash flow. The inconsistency in findings provides a research gap that motivates this study.

## LITERATURE REVIEW

### A. Theoretical Framework

**Agency Theory.** Jensen and Meckling (1976) explain that conflicts of interest arise between shareholders (principals) and management (agents) in firm governance. Managers tend to retain earnings for internal purposes, while shareholders expect dividend distributions. Because management typically holds more complete information about the firm's condition than shareholders, information asymmetry emerges. In this situation, dividend policy can function as a monitoring mechanism that reduces the potential misuse of corporate funds by management. Dividend payments shrink the free cash flow available for managerial discretion, thereby narrowing the scope for unproductive use of funds and reducing agency costs. Hendra and Anam (2020) emphasize that corporate governance mechanisms are needed to mitigate agency conflict in dividend decisions, while Diana and Hutasoit (2017) show that agency conflict intensifies when firms hold large free cash flow, making dividends an instrument of managerial discipline.

**Signaling Theory.** Spence's (1973) signaling concept holds that managers possess superior information about the firm's condition and prospects relative to outside investors. Firms use dividend policy as a signal to the market regarding financial health and future prospects. A consistent or increasing dividend is interpreted as a positive signal of strong performance and stable cash flow, whereas a dividend cut is typically read as a negative signal. Nie and Yin (2022) add an asymmetry to this signaling logic: negative dividend events (cuts and omissions) carry a stronger informational impact than positive events (increases and initiations), indicating that negative signals reveal more about expected future cash-flow volatility than positive ones.

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Dividend Policy Theory (Bird-in-the-Hand). Gordon and Lintner's bird-in-the-hand theory argues that investors prefer a certain dividend today over an uncertain capital gain in the future — a bird in hand is worth more than a bird in the bush. Firms in sound financial condition therefore tend to distribute higher dividends to build investor confidence. Audityani and Yuyetta (2019) find empirical support for this view, showing that profitability is a primary determinant of dividend decisions, reflecting the trade-off firms make between current financial condition and future investment needs.

## B. Construct Definitions and Measurement

Dividend policy refers to management's decision on how much of the firm's earnings to distribute to shareholders versus retain for reinvestment (Renita et al., 2020; Pattiruhu & Paais, 2020). The Dividend Payout Ratio (DPR) captures the percentage of net income allocated to shareholders (Hanif & Bustamam in Silviana et al., 2017). DPR is the preferred indicator for capital-intensive industries such as mining because it directly reflects management's distribution decision rather than a per-share or yield metric that is more sensitive to share price movements (Herlina & Agustiningsih, 2024).  $DPR = \text{Cash Dividend} / \text{Net Income}$

Liquidity reflects a firm's capacity to meet short-term obligations using current assets. Sufficient liquidity is generally viewed as a precondition for dividend payment, since firms first need to maintain working capital before distributing earnings (Suyono, 2018; Farooq et al., 2024). Liquidity is measured by the Current Ratio (CR).  $CR = \text{Current Assets} / \text{Current Liabilities}$

Leverage describes the extent to which a firm relies on debt financing. Higher leverage increases fixed obligations (interest and principal repayment), which can constrain the cash available for dividends (Weston & Brigham, 2014). Leverage is measured by the Debt to Equity Ratio (DER).  $DER = \text{Total Debt} / \text{Total Equity}$

Profitability. Profitability captures a firm's capacity to generate earnings from its asset base, which is the primary source of dividend-paying capacity (Fama & French, 2001). Profitability is measured by Return on Assets (ROA).  $ROA = \text{Net Income After Tax} / \text{Total Assets}$

An independent commissioner is a board member with no financial, managerial, or ownership affiliation to the company, tasked with protecting minority shareholder interests and maintaining objective oversight (Gayatri et al., 2025). OJK Regulation No. 33/POJK.04/2014 requires independent commissioners to constitute at least 30% of the board.  $KI = \text{Number of Independent Commissioners} / \text{Total Board Members}$

Institutional ownership is the proportion of shares held by entities such as pension funds, investment firms, or insurance companies. Shleifer and Vishny (1986) argue that institutional investors possess both the capability and incentive to monitor management more effectively than dispersed retail shareholders, which theoretically strengthens the disciplinary role of dividends.  $\text{Institutional Ownership} = \text{Institutional Shares} / \text{Total Shares Outstanding}$

Free cash flow (FCF) is the cash remaining after a firm covers operating needs and the capital expenditure required to maintain or expand its asset base. Jensen (1986) argues that positive FCF increases the potential for agency conflict because managers gain discretion over surplus cash, making dividends an important disciplining mechanism. FCF is positioned as the moderating variable in this study because it is theorized to directly influence the intensity of the agency-conflict dynamics that connect leverage, profitability, and institutional ownership to dividend policy (Thanatawee, 2020; Bostanci et al., 2021).  $FCF = (\text{Operating Cash Flow} - \text{Capital Expenditure}) / \text{Total Assets}$

## C. Summary of Prior Empirical Studies

To position the research gap more precisely, Table A summarizes selected prior studies on the determinants of dividend policy, including the role of free cash flow as a moderating variable.

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**Table 4. Summary of Previous Studies on Dividend Policy Determinants and the Moderating Role of Free Cash Flow**

| Study                        | Variables                                                                                                                                           | Key Finding                                                                                                                                                                                                              |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Diana & Hutasoit (2017)      | FCF, institutional ownership → dividend policy, moderated by profitability                                                                          | FCF and institutional ownership have no significant direct effect; profitability significantly moderates the FCF–dividend relationship                                                                                   |
| Maharani & Terzaghi (2022)   | Profitability, leverage, firm size, managerial ownership → dividend policy, moderated by liquidity                                                  | Leverage and managerial ownership are key drivers; profitability and firm size show no direct effect; liquidity strengthens the size and ownership relationships but not profitability or leverage                       |
| Sumarsono & Rahmawati (2023) | FCF, profitability, firm size → dividend policy                                                                                                     | FCF, profitability, and firm size positively and significantly affect dividend policy                                                                                                                                    |
| Lajar & Marsudi (2021)       | Managerial ownership, institutional ownership, liquidity, profitability, debt policy → dividend policy (mining sector)                              | Liquidity has no significant effect on dividend policy among Indonesian mining firms                                                                                                                                     |
| Renaldo et al. (2023)        | Capital structure, profitability, blockholder ownership → dividend policy, moderated by FCF                                                         | Profitability significantly affects payout; capital structure, blockholder ownership, and FCF show no significant direct or moderating effect                                                                            |
| Izabel & Kuswanto (2025)     | GCG mechanisms (managerial, institutional, state ownership, independent commissioner proportion), moderated by FCF, controlled by ROA/leverage/size | GCG elements jointly affect dividend policy; only independent commissioners and ROA are significant individually; institutional/managerial/state ownership and leverage are not                                          |
| Saidah, Rambe & Arief (2024) | Debt to Asset Ratio, institutional ownership, managerial ownership → dividend policy, moderated by FCF                                              | DAR is negative and non-significant; institutional and managerial ownership are positive but non-significant; FCF positively and significantly affects payout and moderates DAR, institutional, and managerial ownership |
| Sanan (2019)                 | Board size, independent director proportion, female director proportion → dividend policy, moderated by FCF                                         | Independent and female director proportions negatively affect payout; board size is non-significant; FCF has a significant negative moderating effect                                                                    |

*Source: reviews 13, 2026.*

Across these studies, profitability emerges as the most consistently significant predictor of dividend policy, while liquidity, leverage, and free cash flow produce mixed results depending on sector and model specification. Governance variables independent commissioners and institutional ownership show an even less consistent pattern:

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some studies report significant positive effects, while others, particularly in capital-intensive or resource-based sectors, find no significant relationship. This inconsistency constitutes the central research gap motivating the present study: existing evidence has not comprehensively tested whether free cash flow conditions the effect of governance and financial characteristics on dividend policy specifically within Indonesia's mining sector, an industry shaped by heavy capital expenditure obligations, commodity price cycles, and energy-transition pressures.

## D. Conceptual Framework

The conceptual framework links liquidity, leverage, profitability, independent commissioners, and institutional ownership to dividend policy, with free cash flow positioned as a moderating variable on the leverage, profitability, and institutional ownership pathways (Sekaran & Bougie, 2016). Firms with strong internal capacity (high liquidity, high profitability) are theorized to have greater latitude to distribute dividends, while firms with high leverage face competing claims on cash flow that can constrain payouts. Independent commissioners and institutional ownership represent the governance dimension of the framework: both are theorized to push management toward distributing free cash flow to shareholders rather than retaining it for potentially over-invested or self-serving purposes (Gayatri et al., 2025; Khan, 2022). Free cash flow is placed as a moderator rather than a direct antecedent because, conceptually, it is the resource pool through which agency conflict materializes its presence is expected to amplify (or dampen) the strength of the governance and leverage pathways toward dividend policy, rather than to operate as an independent driver in its own right (Jensen, 1986).

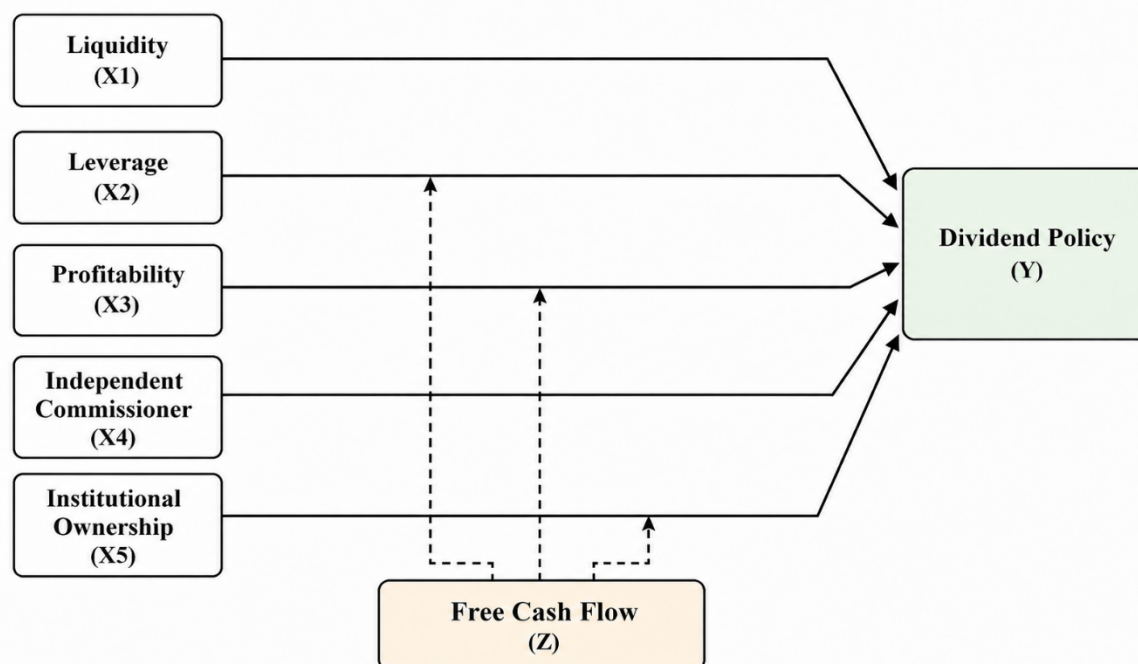


Figure 1. Conceptual Framework

## E. Hypotheses Development

- **H1: Liquidity has a positive effect on dividend policy.** Firms with sufficient current assets relative to current liabilities are better positioned to meet short-term obligations without compromising their capacity to distribute earnings (Silviana & Mahirun, 2024). A high current ratio signals to shareholders that the firm can pay dividends without jeopardizing operational liquidity.
- **H2: Leverage has a negative effect on dividend policy.** Firms with heavier debt burdens prioritize interest and principal obligations to creditors, leaving less residual cash for shareholders (Yarram & Dollery, 2019). High leverage also signals elevated financial risk, which discourages aggressive dividend distribution.

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- **H3: Profitability has a positive effect on dividend policy.** Profitability is the most direct source of dividend-paying capacity. Firms generating higher returns on assets have more retained earnings available for distribution and stronger incentives to signal favorable performance through dividends (Fama & French, 2001; Herlina & Agustini, 2024).
- **H4: Independent commissioners have a positive effect on dividend policy.** A higher proportion of independent commissioners strengthens the monitoring of management, reducing the likelihood that earnings are retained for managerial empire-building rather than distributed to shareholders (Perwira & Ratnaningsih, 2017; Gayatri et al., 2025).
- **H5: Institutional ownership has a positive effect on dividend policy.** Institutional investors possess both the resources and incentive to monitor management closely. Greater institutional ownership is theorized to push firms toward more disciplined, shareholder-aligned payout decisions (Shleifer & Vishny, 1986; Khan, 2022).
- **H6: Free cash flow weakens the negative effect of leverage on dividend policy.** When firms hold ample free cash flow, the constraining effect of debt obligations on dividend capacity is theorized to be cushioned, since internally generated cash can service both debt and dividend claims simultaneously.
- **H7: Free cash flow strengthens the positive effect of profitability on dividend policy.** High profitability combined with high free cash flow is expected to amplify dividend distribution, as both the income statement and the cash position simultaneously support a larger payout (Diana & Hutasoit, 2017).
- **H8: Free cash flow strengthens the positive effect of institutional ownership on dividend policy.** Institutional investors are theorized to be more effective monitors when surplus cash is actually available to extract, since excess free cash flow raises the risk of overinvestment that active monitors are incentivized to curb through demands for higher payout (Setia-Atmaja et al., 2019; Bostanci et al., 2021).

## METHOD

### A. Research Design

This study employs a quantitative, causal research design to test the hypothesized relationships among firm characteristics, governance mechanisms, and dividend policy. The causal-quantitative approach is appropriate because the study seeks to estimate both direct effects (liquidity, leverage, profitability, independent commissioners, and institutional ownership on dividend policy) and an indirect, conditional effect (the moderating role of free cash flow on the leverage, profitability, and institutional ownership pathways) within a single integrated empirical model. This design follows Diana and Hutasoit (2017), who combined quantitative panel methods with Moderated Regression Analysis to evaluate free cash flow and institutional ownership effects on dividend policy, and Bungaran and Dewayanto (2020), who used a causal-quantitative approach with multiple regression to examine governance and financial characteristics jointly.

### B. Population, Sample, and Sampling Technique

The population comprises all 47 mining sector companies listed on the Indonesia Stock Exchange (IDX) during 2021–2024. Sample selection used purposive sampling, a non-probability technique appropriate when the research requires units that meet specific, theoretically relevant criteria (Erlina, Atmanegara, & Nasution, 2023). This approach follows Diana and Hutasoit (2017) and Yoewono (2023), both of whom applied purposive sampling in panel-based dividend policy research. The sampling criteria were:

1. Mining sector companies listed on the IDX;
2. Companies that published complete annual reports and audited financial statements for the full 2021–2024 period;
3. Companies that did not experience delisting during the study period; and
4. Companies that distributed dividends at least once during the study period (to ensure the dependent variable carries meaningful variation rather than being structurally zero).

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**Table 5. details the sample selection process.**

| Criteria                                                               | Number of Firms Excluded / Remaining |
|------------------------------------------------------------------------|--------------------------------------|
| Total population (mining sector firms listed on IDX, 2021–2024)        | 47                                   |
| Firms with incomplete annual reports / financial statements, 2021–2024 | –2                                   |
| Firms delisted during the study period                                 | –0                                   |
| Firms that did not distribute dividends at all during 2021–2024        | –20                                  |
| Final sample                                                           | 25                                   |

With 25 firms observed over four years (2021–2024), the study yields 100 firm-year observations, consistent with the panel structure reported in the original draft. Secondary data were collected from audited annual financial statements and annual reports published on the IDX website and each sampled company's official investor relations page, an approach consistent with Bungaran and Dewayanto (2020) and Diana and Hutasoit (2017), who relied on the same published, audited sources to preserve measurement objectivity.

### C. Operational Definition and Measurement of Variables

Table 4 summarizes the operational definition, measurement formula, and measurement scale for each construct used in the panel regression and the Moderated Regression Analysis.

**Table 6. Operational Definition and Measurement of Research Variables**

| Variable                      | Definition                                                             | Formula                                                                   | Scale |
|-------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------|-------|
| Dividend Policy (Y)           | Proportion of net income distributed to shareholders as cash dividends | $DPR = \text{Cash Dividend} / \text{Net Income}$                          | Ratio |
| Liquidity (X1)                | Capacity to meet short-term obligations using current assets           | $CR = \text{Current Assets} / \text{Current Liabilities}$                 | Ratio |
| Leverage (X2)                 | Extent of debt usage in the firm's financing structure                 | $DER = \text{Total Debt} / \text{Total Equity}$                           | Ratio |
| Profitability (X3)            | Capacity to generate net income from total assets                      | $ROA = \text{Net Income After Tax} / \text{Total Assets}$                 | Ratio |
| Independent Commissioner (X4) | Proportion of independent commissioners on the board                   | $KI = \text{Independent Commissioners} / \text{Total Board Members}$      | Ratio |
| Institutional Ownership (X5)  | Proportion of shares held by institutional entities                    | $IO = \text{Institutional Shares} / \text{Total Shares Outstanding}$      | Ratio |
| Free Cash Flow (Z, moderator) | Cash available after meeting operating and capital expenditure needs   | $FCF = (\text{Operating Cash Flow} - \text{CapEx}) / \text{Total Assets}$ | Ratio |

### D. Data Analysis Technique

Data were analyzed using EViews 13 with panel data regression. Panel data combine cross-sectional and time-series observations (pooled data), allowing the model to capture both between-firm and within-firm variation over the 2021–2024 period (Ghozali & Ratmono, 2017). The analysis proceeded in four stages: (1) descriptive statistics to characterize the data, (2) classical assumption testing, (3) panel data regression to estimate direct effects,

and (4) Moderated Regression Analysis (MRA) to test the moderating role of free cash flow, following Diana and Hutasoit (2017), who explicitly modeled interaction terms to test moderation in a similar dividend-policy context.

### E. Panel Data Regression Model

$$Y_{lit} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \mu_{it}$$

where  $i = 1, 2, \dots, n$  denotes the cross-sectional unit (firm);  $t = 1, 2, \dots, n$  denotes the time period (year);  $\alpha$  is the intercept;  $\beta_1$ – $\beta_5$  are the regression coefficients;  $Y$  is dividend policy (DPR);  $X_1$  is liquidity (CR);  $X_2$  is leverage (DER);  $X_3$  is profitability (ROA);  $X_4$  is the independent commissioner proportion;  $X_5$  is institutional ownership; and  $\mu$  is the error term.

### F. Panel Model Selection: Common, Fixed, and Random Effects

Three estimators are available for panel data: the Common Effect Model (CEM), which pools cross-section and time-series data using Ordinary Least Squares (OLS) under the assumption that firm behavior is uniform across time; the Fixed Effect Model (FEM), which uses dummy variables (the Least Squares Dummy Variable approach) to capture firm-specific intercept differences arising from unobserved heterogeneity such as managerial culture or incentive structures, while assuming common slopes; and the Random Effect Model (REM), which treats firm-specific intercept variation as part of the error structure and is estimated using Generalized Least Square (GLS), an approach that inherently corrects for heteroscedasticity (Ghozali & Ratmono, 2017). The appropriate estimator was determined sequentially through three specification tests: the Chow test (CEM vs. FEM), the Hausman test (FEM vs. REM), and the Lagrange Multiplier test (REM vs. CEM) as a confirmatory check. The decision rule for the Chow test is that a probability below 0.05 favors FEM over CEM; if FEM is favored, the Hausman test follows, where a probability below 0.05 favors FEM over REM and a probability above 0.05 favors REM. The Lagrange Multiplier test, based on Breusch-Pagan statistics, is used to confirm whether REM is preferable to CEM when the Hausman test points toward REM.

### G. Classical Assumption Tests

Because the selected estimator in this study is the Random Effect Model using GLS, the normality and heteroscedasticity assumptions do not require separate testing: GLS estimation is designed to correct for heteroscedasticity, and with 100 observations the Central Limit Theorem renders the normality assumption on residuals non-binding (Gujarati & Porter, 2009; Patiran, 2021). Autocorrelation testing is similarly not required under REM, since the GLS estimator already accounts for both time-series and cross-sectional correlation in the disturbance term, satisfying the Best Linear Unbiased Estimator (BLUE) property. Multicollinearity, however, is tested directly through the pairwise correlation matrix of the independent variables: a correlation coefficient below 0.85 (some references use 0.80 as a more conservative threshold) between any two independent variables indicates the absence of problematic multicollinearity.

### H. Hypothesis Significance Testing

Partial test (t-test). Used to determine the individual effect of each independent variable on dividend policy. If the probability value is below the 0.05 significance level, the null hypothesis is rejected and the independent variable is concluded to have a statistically significant partial effect on the dependent variable. Simultaneous test (F-test). Used to determine whether all independent variables jointly affect dividend policy. If the F-statistic probability is below 0.05, the independent variables are concluded to have a significant joint effect. Coefficient of determination ( $R^2$  and Adjusted  $R^2$ ).  $R^2$  indicates the proportion of variation in dividend policy explained by the independent variables, ranging from 0 to 1; a value closer to 1 indicates that the model captures most of the variation in the dependent variable. Adjusted  $R^2$  corrects  $R^2$  for the number of predictors in the model, providing a more conservative measure of explanatory power, particularly relevant given the multi-variable specification used here.

### I. Moderated Regression Analysis (MRA)

Because this study positions free cash flow as a moderating variable, an interaction-term regression (Moderated Regression Analysis) is required in addition to the direct-effect panel model (Erlina, Atmanegara, & Nasution, 2023). The MRA equation is specified as:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 Z_{it} + \beta_7 (X_{2it} \times Z_{it}) + \beta_8 (X_{3it} \times Z_{it}) + \beta_9 (X_{5it} \times Z_{it}) + \mu_{it}$$

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where Z is free cash flow (the moderating variable), and  $X2 \times Z$ ,  $X3 \times Z$ , and  $X5 \times Z$  are the interaction terms representing the moderating effect of free cash flow on leverage, profitability, and institutional ownership, respectively. Following Widarjono (2018) and Winarno (2017), a moderating effect is confirmed only if the coefficient of the interaction term is statistically significant (probability below 0.05); if the interaction term is not significant, free cash flow is concluded to neither strengthen nor weaken the corresponding direct relationship, even if the sign of the interaction coefficient is in the theoretically expected direction.

## RESULTS AND DISCUSSION

### A. Descriptive Statistics

The descriptive statistics for all research variables across 100 observations are presented in Table 7.

**Table 7. Descriptive Statistics**

| Statistic | X1 (CR) | X2 (DER) | X3 (ROA) | X4 (KI) | X5 (IO) | Y (DPR) | Z (FCF) |
|-----------|---------|----------|----------|---------|---------|---------|---------|
| Mean      | 2.376   | 0.963    | 0.153    | 0.439   | 0.810   | 0.412   | 0.134   |
| Median    | 1.844   | 0.491    | 0.095    | 0.400   | 0.854   | 0.310   | 0.095   |
| Maximum   | 9.988   | 7.202    | 0.616    | 0.750   | 0.998   | 1.846   | 0.643   |
| Minimum   | 0.550   | 0.042    | -0.057   | 0.300   | 0.100   | 0.000   | -0.127  |
| Std. Dev. | 1.523   | 1.234    | 0.155    | 0.119   | 0.178   | 0.366   | 0.155   |
| Obs.      | 100     | 100      | 100      | 100     | 100     | 100     | 100     |

*Source: reviews 13, 2026.*

The liquidity variable (X1/CR) has a mean of 2.376, indicating that on average, mining companies maintain adequate liquidity. The leverage variable (X2/DER) has a mean of 0.963, indicating that debt utilization remains below equity on average. The profitability variable (X3/ROA) has a mean of 0.153, indicating an average return of 15.3% on assets. The independent commissioner proportion (X4) averages 0.439 (43.9%), above the regulatory minimum. The institutional ownership (X5) averages 0.810, indicating dominant institutional shareholding. The dividend payout ratio (Y/DPR) averages 0.413, suggesting moderate dividend distribution. Free cash flow (Z/FCF) averages 0.134, indicating a generally positive free cash flow position.

Beyond the means reported in the original draft, the extremes in the data point to firm-level patterns worth foregrounding for reviewers. The minimum liquidity (CR = 0.550) was recorded at PT Garda Tujuh Buana Tbk (2021), reflecting constrained short-term solvency, while the maximum (CR = 9.988) was recorded at PT Cita Mineral Investindo Tbk (2024), indicating current assets far in excess of current liabilities. The minimum leverage (DER = 0.042) belonged to PT Cita Mineral Investindo Tbk (2024), denoting a financing structure dominated by internal capital, whereas the maximum (DER = 7.202) belonged to PT Delta Dunia Makmur Tbk (2024), denoting heavy reliance on debt. Profitability ranged from a loss position (ROA = -0.057, PT Garda Tujuh Buana Tbk, 2024) to a strongly profitable position (ROA = 0.616, PT Golden Energy Mines Tbk, 2022). On governance variables, independent commissioner proportion ranged from the regulatory floor of 30% (PT Vale Indonesia Tbk, 2022) to 75% (PT TBS Energi Utama Tbk, 2021), while institutional ownership ranged from 10% (PT Bayan Resources Tbk, 2021–2023) to 99.8% (PT Golden Energy Mines Tbk, 2022). Several firms — including PT Garda Tujuh Buana Tbk, PT Harum Energy Tbk, PT Ifishdeco Tbk, and PT Mitra Investindo Tbk — reported a DPR of 0 in specific years, while PT Petrosea Tbk (2022) reported a DPR of 1.846, exceeding net income, implying that retained cash reserves were drawn down to fund the distribution.

The Jarque-Bera test indicates that none of the seven series is normally distributed at the univariate level (all probabilities = 0.000); however, with 100 observations, the Central Limit Theorem supports proceeding with regression-based inference rather than requiring normal residuals at the variable level (Widarjono, 2018).

### 1. Model Selection

The Chow test produced a probability of 0.0001 (< 0.05), indicating the Fixed Effect Model is preferred over the Common Effect Model. The subsequent Hausman test produced a probability of 0.5846 (> 0.05), indicating the

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Random Effect Model is preferred over the Fixed Effect Model. The Lagrange Multiplier test confirmed the Random Effect Model as the most appropriate approach (Cross-section  $p = 0.0060 < 0.05$ ).

## 2. Classical Assumption Tests

Since the selected model is the Random Effect Model using the GLS estimation method, normality and heteroscedasticity tests are not required, as GLS inherently addresses these issues. The multicollinearity test showed that all correlation coefficients between independent variables were below 0.85, confirming the absence of multicollinearity problems.

## 3. Panel Data Regression Results

**Table 8. Panel Data Regression Results (Random Effect Model)**

| Variable                      | Coefficient | Std. Error | Prob.  |
|-------------------------------|-------------|------------|--------|
| X1 (Liquidity/CR)             | -0.0149     | 0.0242     | 0.5386 |
| X2 (Leverage/DER)             | -0.0261     | 0.0393     | 0.5082 |
| X3 (Profitability/ROA)        | 1.1256      | 0.2520     | 0.0000 |
| X4 (Independent Commissioner) | 0.4188      | 0.3502     | 0.2348 |
| X5 (Institutional Ownership)  | 0.0807      | 0.2376     | 0.7348 |
| Constant                      | 0.0511      | 0.2762     | 0.8537 |
| R-squared                     | 0.1973      |            |        |
| Adjusted R-squared            | 0.1546      |            |        |
| F-statistic                   | 4.6196      |            | 0.0008 |
| Durbin-Watson                 | 2.6730      |            |        |

Source: *eviews 13*, 2026.

Based on Table 8, the regression equation is:  $Y = 0.0511 - 0.0149X1 - 0.0261X2 + 1.1256X3 + 0.4188X4 + 0.0807X5$

The F-statistic probability is 0.0008 ( $< 0.05$ ), indicating that all independent variables simultaneously influence dividend policy. The Adjusted R-squared of 0.1546 means that the model explains 15.46% of dividend policy variation; the remaining 84.54% is explained by variables outside this model. The low Adjusted R-squared is common in finance research given the complexity of factors influencing dividend policy in the capital-intensive mining sector.

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#### 4. Moderated Regression Analysis (MRA) Results

**Table 9. Moderated Regression Analysis (MRA) Results**

| Variable                 | Coefficient | Std. Error | Prob.  |
|--------------------------|-------------|------------|--------|
| X1 (Liquidity)           | -0.0201     | 0.0250     | 0.4235 |
| X2 (Leverage)            | 0.0002      | 0.0473     | 0.9963 |
| X3 (Profitability)       | 2.0358      | 0.5182     | 0.0002 |
| X4 (Ind. Commissioner)   | 0.3752      | 0.3698     | 0.3131 |
| X5 (Inst. Ownership)     | 0.1517      | 0.3393     | 0.6560 |
| Z (Free Cash Flow)       | -0.0352     | 0.9685     | 0.9710 |
| X2×Z (Leverage×FCF)      | -0.1020     | 0.3328     | 0.7598 |
| X3×Z (Profitability×FCF) | -1.1464     | 1.0906     | 0.2960 |
| X5×Z (Inst. Own.×FCF)    | -0.3354     | 0.9028     | 0.7111 |
| R-squared                | 0.2271      | —          | —      |
| Adj. R-squared           | 0.1498      | —          | —      |
| F-statistic              | 2.9385      | —          | 0.0042 |

Source: EViews 13, 2026.

#### 5. Hypothesis Testing Summary

**Table 10. Hypothesis Testing Results**

| H  | Hypothesis                                                                        | Coeff.  | Prob.  | Decision |
|----|-----------------------------------------------------------------------------------|---------|--------|----------|
| H1 | Liquidity has a positive effect on dividend policy                                | -0.0149 | 0.5386 | Rejected |
| H2 | Leverage has a negative effect on dividend policy                                 | -0.0261 | 0.5082 | Rejected |
| H3 | Profitability has a positive effect on dividend policy                            | 1.1256  | 0.0000 | Accepted |
| H4 | Independent commissioner has a positive effect on dividend policy                 | 0.4188  | 0.2348 | Rejected |
| H5 | Institutional ownership has a positive effect on dividend policy                  | 0.0807  | 0.7348 | Rejected |
| H6 | FCF weakens the negative effect of leverage on dividend policy                    | -0.1020 | 0.7598 | Rejected |
| H7 | FCF strengthens the positive effect of profitability on dividend policy           | -1.1464 | 0.2960 | Rejected |
| H8 | FCF strengthens the positive effect of institutional ownership on dividend policy | -0.3354 | 0.7111 | Rejected |

Source: eviews 13, 2026.

#### 6. DISCUSSION

**Liquidity and Dividend Policy (H1 — Rejected).** Liquidity shows no significant effect on dividend policy (coefficient =  $-0.0149$ , prob. =  $0.5386$ ), leading to the rejection of H1. This result is best explained through an

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agency-theory lens rather than the signaling logic implied by H1: management in the sampled mining firms does not appear to treat current ratio as a primary basis for the payout decision. The sampled firms typically hold current assets two to five times larger than current liabilities, a buffer oriented toward operational, exploration, and project-development needs rather than dividend capacity. Disclosures in PT Aneka Tambang Tbk's 2021–2024 annual reports illustrate the mechanism: liquid resources were directed toward raw-material procurement, downstream-processing divestments, power-plant construction, and bank debt repayment, with strong liquidity coexisting with deliberately restrained dividend distribution to preserve operational flexibility. Conversely, some firms maintained dividend payments even as liquidity declined, in order to protect investor confidence and market reputation — a pattern inconsistent with a simple liquidity-driven payout rule. This finding is consistent with Lajar and Marsudi (2021), Pujiyanti et al. (2025), Alkatiri et al. (2024), Sari and Sudjarni (2015), and Arifin and Asyik (2015), all of whom report a non-significant liquidity effect in mining or resource-based samples.

**Leverage and Dividend Policy (H2 — Rejected).** Leverage shows no significant effect on dividend policy (coefficient =  $-0.0261$ , prob. =  $0.5082$ ), leading to the rejection of H2. The capital-intensive nature of mining — exploration, heavy equipment, and long-horizon project financing — means debt is used as a strategic financing tool rather than a constraint that automatically crowds out dividends. A firm with high leverage may still pay dividends if cash flow and profitability remain strong, while a firm with low leverage may retain earnings for investment rather than distribute them. The 2021–2024 commodity boom is the most plausible contextual driver of this null result: elevated coal and mineral prices generated operating cash flows strong enough for many firms to service debt obligations and sustain dividend payments simultaneously, decoupling the leverage-dividend relationship that holds in lower-cash-flow periods. This result aligns with Naibaho and Naurah (2023), Kewas et al. (2025), and Limbong and Darsono (2021).

**Profitability and Dividend Policy (H3 — Accepted).** Profitability has a significant positive effect on dividend policy (coefficient =  $1.1256$ , prob. =  $0.0000$ ), supporting H3 and confirming it as the only consistently significant direct predictor in the model. Annual reports from 2022–2024 show firms such as PT Baramulti Sukses Sarana Tbk and PT Adaro Energy Indonesia Tbk actively expanding production volume and sales to capture the commodity-price upswing, translating directly into higher ROA and a correspondingly higher payout capacity. The result is simultaneously consistent with agency theory (dividends curb the retention of surplus earnings under management's discretion), signaling theory (high ROA signals favorable prospects to the market), and bird-in-the-hand theory (investors value the certainty of a cash dividend over an uncertain future capital gain). This finding is corroborated by Sari and Sudjarni (2015), Sumarsono and Rahmawati (2023), and Herlina and Agustiningsih (2024), though it diverges from Arifin and Asyik (2015), who found no significant profitability effect in a different sample period.

**Independent Commissioners and Dividend Policy (H4 — Rejected).** Independent commissioner proportion shows no significant effect on dividend policy (coefficient =  $0.4188$ , prob. =  $0.2348$ ), leading to the rejection of H4, even though the coefficient's sign is directionally consistent with agency-theory expectations. The most plausible explanation is a mismatch between the commissioners' actual oversight mandate and the payout decision itself: in mining firms, independent commissioners are primarily oriented toward operational risk control, environmental and regulatory compliance, and long-term business continuity, rather than direct involvement in earnings-distribution decisions, which more typically rest with the board of directors and controlling shareholders. From a signaling-theory perspective, the market appears to weight profitability and cash-flow stability far more heavily than board composition when interpreting dividend signals. This result is consistent with Perwira and Ratnaningsih (2016, 2017), Hadamean and Ratmono (2019), Setiawan and Yuyetta (2013), Pradnyawati and Yadnyana (2020), Wardani and Hermuningsih (2021), and Yoewono (2023).

**Institutional Ownership and Dividend Policy (H5 — Rejected).** Institutional ownership shows no significant effect on dividend policy (coefficient =  $0.0807$ , prob. =  $0.7348$ ), leading to the rejection of H5. Although Shleifer and Vishny's (1986) monitoring logic predicts a positive relationship, Indonesian mining-sector institutional holders appear to behave more as long-horizon value investors than as activist monitors demanding short-term cash distributions; ownership in this sector also remains relatively concentrated, leaving controlling shareholders rather than diffuse institutional blocks as the de facto decision-makers on payout. The 2021–2024 period additionally coincided with mounting global energy-transition pressure, under which institutional investors appear to have favored funding strategic investment and business continuity over near-term dividend extraction. This result is consistent with Diana and Hutasoit (2017), Hendra and Anam (2020), Izabel and Kuswanto (2025), Septika et al.

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(2022), and Patricia and Septiyanti (2024), but diverges from Aminah and Faramitha (2016) and Saidah et al. (2024), who report a significant relationship in other sectoral or sampling contexts.

**Free Cash Flow as Moderator: Leverage Pathway (H6 — Rejected).** The interaction term between leverage and free cash flow is not significant (coefficient =  $-0.1020$ , prob. =  $0.7598$ ), so free cash flow neither strengthens nor weakens the leverage–dividend relationship. The capital expenditure-to-operating cash flow ratio for several sampled firms — including PT Cita Mineral Investindo Tbk, PT Delta Dunia Makmur Tbk, PT Harum Energy Tbk, PT Vale Indonesia Tbk, PT Mitrabara Adiperdana Tbk, and PT Petrosea Tbk — ranged from roughly 45% to over 100% during the period, indicating that operating cash flow was frequently absorbed by capital spending on fixed assets, mining properties, and exploration rather than left available to offset debt-related constraints on dividends. The 2021–2022 global energy crisis, intensified by post-pandemic demand recovery and the Russia–Ukraine conflict, drove sharp increases in coal and metal prices (as documented in IEA coal market reports), while simultaneously, global supply-chain disruption and surging freight costs (UNCTAD, 2021) and broader operating-cost inflation (PwC, 2023; Deloitte, 2023) raised the cost base mining firms had to absorb. Under mounting global decarbonization pressure, firms appear to have retained free cash flow as a strategic buffer for diversification, downstream (hilirisasi) development, and environmental/reclamation obligations rather than channeling it toward debt-related dividend relief. This is consistent with Jensen (1986) and Easterbrook (1984) on dividend stability under uncertainty, and with Naibaho and Naurah (2023), Nisa et al. (2017), Ramadhani and Nurhayati (2022), Renaldo et al. (2024), and Kewas et al. (2025).

**Moderating Effect of Free Cash Flow on the Profitability-Dividend Policy Relationship (H7 — Rejected).** The interaction term between profitability and free cash flow is not significant (coefficient =  $-1.1463$ , prob. =  $0.2960$ ), so the strong direct profitability effect documented above is not further amplified by the level of free cash flow available. Even when firms are highly profitable and cash-rich, management in this capital-intensive sector appears to prioritize capital expenditure, exploration, and downstream expansion over translating surplus cash into a larger payout — consistent with the view that profitability alone already constitutes a sufficient signal to the market, leaving little incremental signaling value in the cash-flow position itself. The ongoing push toward Indonesia's 2060 Net Zero Emission target and the associated stranded-asset risk for coal-focused miners (as emphasized by the IEA) plausibly reinforce this retention behavior, as diversification into renewable and downstream projects competes directly with dividend distribution for the same pool of free cash flow. This result is consistent with Naibaho and Naurah (2023), Aisyah and Arif (2021), and Miharto et al. (2024).

**Free Cash Flow as Moderator: Institutional Ownership Pathway (H8 — Rejected).** The interaction term between institutional ownership and free cash flow is not significant (coefficient =  $-0.3354$ , prob. =  $0.7111$ ), so institutional monitoring does not become more effective at extracting dividends even when surplus cash is available. This suggests that, contrary to the active-monitoring logic of agency theory, institutional shareholders in this sample are more inclined to support reinvestment of surplus cash than to press for higher distributions, plausibly because long-horizon value creation amid the energy transition is viewed as more strategically important than near-term payout. From a signaling-theory perspective, firms also appear to prioritize stable, predictable dividends over fluctuating cash-flow-driven payouts, limiting the extent to which free cash flow availability can shift institutional preferences toward higher distribution. This result is consistent with Naibaho and Naurah (2023) and Kartika and Mulyani (2023).

## CONCLUSION

Based on the results of this study on the effect of liquidity, leverage, profitability, independent commissioner, and institutional ownership on dividend policy with free cash flow as a moderating variable in mining sector companies listed on the IDX for the period 2021–2024, the following conclusions are drawn: Simultaneously, liquidity, leverage, profitability, independent commissioner, and institutional ownership significantly influence dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Liquidity, measured by the current ratio, does not significantly affect dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Leverage, measured by the debt to equity ratio, does not significantly affect dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Profitability, measured by return on assets, has a significant positive effect on dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Independent commissioner does not significantly affect dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Institutional ownership does not significantly affect dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Free cash flow cannot moderate the effect of leverage

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on dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Free cash flow cannot moderate the effect of profitability on dividend policy in mining sector companies listed on the IDX for the period 2021–2024. Free cash flow cannot moderate the effect of institutional ownership on dividend policy in mining sector companies listed on the IDX for the period 2021–2024.

The limitations of this study include its focus solely on the mining sector, limiting generalizability. The relatively low Adjusted R-squared (15.46%) indicates many other external factors influence dividend policy, such as global commodity price fluctuations, macroeconomic conditions, government policies, and energy transition pressures. Future research is recommended to include additional variables such as firm size, firm age, investment opportunity set, growth opportunity, capital expenditure, business risk, and commodity prices, as well as to extend the research period and broaden the sector coverage.

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**THE EFFECT OF LIQUIDITY, LEVERAGE, PROFITABILITY, INDEPENDENT COMMISSIONERS, AND INSTITUTIONAL OWNERSHIP ON DIVIDEND POLICY WITH FREE CASH FLOW AS A MODERATING VARIABLE IN MINING SECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE DURING THE PERIOD OF 2021 TO 2024**

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