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The Role of Downstreaming Policies in Regulating the Interaction Between Liquidity, Solvability, and Firm Size on the Financial Situation. (of Companies IDX Nickel Mining Sector)

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ABSTRACT: The purpose of this study to analyze the impact of liquidity, solvability, and firm size, as well as the moderating role of downstreaming policy (or hilirisasi policy), on corporate financial performance. This study fills a vacuum in the literature by focusing specifically on the Indonesian nickel mining sector. The research method employs moderated regression analysis and panel data regression to test these relationships. The sample selection was conducted through the use of purposive sampling technique, resulting 6 nickel mining firms that are listed on the Indonesia Stock Exchange (IDX) comprise the sample. with financial report periods spanning 2015–2024. The results indicate that liquidity, solvability, and firm size collectively possess an important influence on corporate financial results. However, partially, only solvability, which is viewed in the context of efficient debt management according to the Capital Structure Theory, is proven to have a significant influence. Conversely, liquidity and firm size partially exhibit no significant influence, supported by the Trade-Off Theory and the concept of diseconomies of scale. Furthermore, the moderated regression test results show that the downstreaming policy is not capable of significantly moderating the relationship between the three independent variables and financial performance, consistent with the Institutional Theory, which considers the policy merely a bureaucracy of compliance. This set of findings holds substantial relevance for both investors and policymakers.

KEYWORDS: Liquidity, solvability, firm size, financial performance, downstreaming policy.

1. INTRODUCTION

Nickel is crucial to the global economy for the production of stainless steel and, in particular, for emerging clean energy technologies such as lithium-ion batteries. Although Indonesia has historically dominated the supply of raw commodities and has the world's largest nickel reserves, the business model that has relied on raw ore exports has been criticized for generating little economic added value domestically. As a result, the Indonesian government has proactively implemented a downstreaming policy, which requires the domestic processing of nickel ore into high-value products such as ferronickel. The goal of this policy is to transform Indonesia from a raw material exporter to a major player in the high-value processing industry.

Law No. 4 of 2009 created the basis for this initiative, and Regulation of the Minister of Energy and Mineral Resources No. 11 of 2014 reinforced it. However, after several relaxations, a new blanket export ban was imposed on January 1, 2020. In this situation, the period 2015–2024 is crucial for conducting empirical analysis on how the important restructuring of the nickel industry value chain has impacted the financial standing of nickel mining firms that are listed on the Indonesia Stock Exchange (IDX).

By looking at how the role of downstream policy moderation affects the relationship between internal company variables, such as solvency (debt to equity ratio), liquidity (current ratio), company size (evaluated using the natural logarithm of total assets), as well

as financial performance (as determined by return on assets, or ROA). Liquidity was chosen because it is sensitive to large capital investment needs.

This study tests the hypothesis that only solvency is partially significant (in accordance with Capital Structure Theory) and that liquidity and company size are not significant (in accordance with Tradition Theory), even though the independent variables as a whole show a significant effect. Furthermore, the moderated regression test is expected to show that downstreaming policies are unable to significantly moderate the correlation between the three and financial performance independent variables. This is in line with the Institutional Theory perspective that such policies can only function as compliance bureaucracy. The results are very important for investors and policymakers.

The original contribution of this study, particularly through modeling downstreaming policy as a moderating variable to assess its effect on the relationship between liquidity (Current Ratio), solvency (Debt-to-Equity Ratio), firm size, and financial performance (Return on Assets/ROA).

RESEARCH METHODS

Variables and their measurement This study's goal is to investigate how downstreaming policies affect liquidity, solvency, and business size on their financial performance. The study's secondary sources of information were collected from six sample businesses over a ten-year period (2015–2024), namely the pre-period (2015–2019) and the post-period (2020–2024). Annual reports published and accessible on the Indonesia Stock Exchange (IDX) website determine nickel downstreaming policies. E-views 12 software was used to perform panel data regression analysis in this study. Table 1 shows how each variable was measured. Announced and accessible through the Indonesia Stock Exchange (IDX) website. E-views 12 software was used to perform panel data regression analysis in this study. Table 1 shows how each variable was measured.

Table 1. Variable of Measurement

Type of Variable	Proxy	Symbol	Formula	Source
Dependent Variable	Profitability	ROA	$\frac{\text{Net Income}}{\text{Total Asset}}$	Brigham., (2011)
	Liquidity	CR	$\frac{\text{Current Liabilities}}{\text{Current Asset}}$	Kasmir., (2019)
Independent Variable	Solvability	DER	$\frac{\text{Total Debt}}{\text{Total Equity}}$	Kasmir., (2019)
	Firm Size	FS	Ln Total Asset	Chen, et al., (2011)
Moderating Variable	Downstreaming Policies	DS	Dummy Variable 1=Before, 2= After	UU Minerba No. 3 (2020)

Source: Data process (2025)

Sampling Method.

This study focuses on companies engaged in the nickel mining industry that are traded on the Indonesian Stock Exchange between 2015 and 2024. This study uses purposive sampling, which means that Samples are chosen using predetermined standards.

Table 2. Sampling Criteria

Description	Amount
Nickel mining companies on the IDX 2015-2024 period	11
Nickel mining companies do not have complete financial reports for 2015-2024	5
Number of research sample	6
Number of observations for 10 years x number of research sample	60

Source: Data process (2025)

Step for Regression Model Testing in This Study.

Chow Test. The findings of the Chow test show that the most appropriate model is used to estimate panel data. The results show that the cross-section F p-value = 0.2315 is greater than 0.05 and the chi-square p-value = 0.1566 is greater than 0.05. Therefore, H_a is rejected and H_0 is accepted, suggesting that the Common Effect Model (CEM) is better than the model of fixed effects (FEM).

Hausman Test.

The Hausman is used to identify which model is most suitable for estimating The fixed effects model (FEM) for panel data or REM, or the random effects model. The Hausman test results show that the cross-section random p-value = 0.0056, which means that the normal p-value is fewer than 0.05. Therefore, Ha is approved and H0 is denied, suggesting that the fixed effect model (FEM) is better used to estimate panel data than the random effect model (REM).

Lagrange Multiplier (LM) Test.

When estimating panel data, the Lagrange Multiplier (LM) test is used to choose between a random effect model (REM) and a common effect model (CEM). The p-value test result of 0.7470, which is higher than 0.05, supports the acceptance of the null hypothesis (H0). Therefore, when estimating panel data, the Common Effect Model (CEM) provides a better fit than the Random Effect Model (REM).

Simultaneous (F-Test).

The significance of the overall impact of independent factors on the dependent variable is evaluated using the F-test, also referred to as the simultaneous test. The significance value and the value of α , which is set at 0.05, or 5%, are compared to do this. The independent factors have a simultaneous impact on the dependent variable when the significance value is less than 0.05.

Partial (T-Test).

The partial regression coefficients of the independent variables are tested using the test of t. This test's objective is to ascertain whether every independent variable significantly affects the dependent variable. If the p-value is less than 5%, then There is a partial relationship between the independent and dependent variables significantly.

Goodness of Fit Test (R²)

In order to ascertain how much the independent variable affects the dependent variable, a determination analysis is used. Through downstream policy as a moderating variable, The coefficient of determination (R²) is utilized to ascertain the degree of contribution that variable X (liquidity, solvency, and company size) to variable Y (financial performance).

Moderated Regression Analysis

Interaction testing, also known as Moderated Regression Analysis (MRA), is a linear multiple regression technique that uses interaction elements in the regression equation. This test is intended to ascertain whether the moderating variable affects the relationship between variable X and variable Y.

2. RESULTS & DISCUSSION

Descriptive analysis of liquidity statistics (X1-CR) from 60 observations shows a highly abnormal distribution, skewed to the right and leptokurtic. Data variation is high, with a mean of 3.07 much higher than the median of 2.20, indicating that the mean value is significantly pulled upward by the presence of extreme values. The Solvency Variable (X2-DER) of sixty companies shows significant data variation (Standard Deviation 1.13), with an average of 0.75 well above the median of 0.38. This indicates that, although most companies have relatively low solvency, there are extremely high extreme values, with data ranging from 0.04 to 5.25.

The Company Size variable (X3-Ln), determined using the entire assets' natural logarithm, shows balanced and stable data characteristics from 60 observations. The average value of 29.90 is very close to the median of 30.12 and is supported by a small standard deviation (1.32), indicating that the variation in size between businesses is not too large. The dependent variable of financial performance (Y-ROA) from 60 companies shows that, although most companies have relatively low profitability (median 0.03), the average value of 0.04 is higher. This is because there are companies with fairly high profitability (maximum 0.30) and companies with relatively small losses (minimum -0.15). The variation between companies is also relatively small.

Table 3. Descriptive Statistics

Variabel	Mean	Median	Maksimum	Minimum	Std. Dev.
CR	3.065.747	2.203.965	2.016.748	0.800384	2.979.356
DER	0.752739	0.383506	5.250.442	0.042451	1.131.013
LN	2.989.934	3.011.688	3.206.914	2.791.338	1.319.515
Z	1.500000	1.500000	2000000	1000000	0.504219
ROA	0.044711	0.030622	0.296974	-0.152168	0.07852

Source: Data Process (2025)

Simultaneous (F-Test).

Based on the F-test results above, the F-statistic p-value of 0.00615 < 0.05 indicates that H0 is rejected and Ha is accepted, which means that liquidity, solvency, and company size simultaneously affect or significantly change financial performance (ROA).

Tabel 4. Simultaneous (F-Test).

Variable	F-Test
R-sq	0.294742
Adj R-sq	0.243451
S.E. of regression	0.068296
F-sta	5.746.417
Prob (F-Sta)	0.000615

Source: Data Process (2025)

Partial (T-Test).

The CR variable (liquidity) possesses a p-value of 0.4247, exceeding 0.05, meaning that accepting H₀ and rejecting H_a indicates that liquidity has no significant effect or difference on monetary performance (ROA). The DER variable (solvency) has a p-value of 0.0002, which is less than 0.05, meaning that solvency has difference on financial performance (ROA). The LN (company size) has a p-value of 0.0727.

Tabel 5. Partial (T-Test).

Variabel	Coefficient	Std. Error	t-Statistic	Prob.
C	0.394497	0.225651	1.748.265	0.0860
CR	-0.002611	0.003246	-0.804305	0.4247
DER	-0.037726	0.009297	-4.057.942	0.0002
LN	-0.013982	0.00764	-1.829.982	0.0727

Source: Data Process (2025)

Goodness of Fit Test (R²)

According to The corrected R-squared value obtained from the R² coefficient of determination test is 0.243451, which indicates that liquidity, solvency, and company size contribute 24% of the total financial performance value. Other factors not covered in this investigation contribute 76% of the total.

Moderated Regression Analysis (MRA)

CR's relationship to the dependent variable with Z moderation has a p-value of 0.5088. This suggests that there is no meaningful impact from the Z variable and cannot moderate or strengthen the effect of CR on the variable that depends on.

With a p-value of 0.7620 for the DER variable on the dependent variable with Z moderation, Thus, it can be said that there is no major effect and cannot moderate or strengthen the effect of DER on the dependent variable.

The variable LN on the dependent variable with moderation Z produces a p-value of 0.3035, This implies that variable Z has no significant effect and cannot moderate or strengthen the effect of company size on the dependent variable, if H₀ is approved whereas H_a is denied.

Tabel 6. Moderated Regression Analysis (MRA)

Variabel	Coef	Std. Error	t-Sta	Prob.
C	-0.287265	0.731669	-0.392616	0.6962
CR	-0.009774	0.011159	-0.875918	0.3851
DER	-0.061702	0.073401	-0.840611	0.4044
LN	0.009998	0.024067	0.415427	0.6795
Z	0.529344	0.475268	1.113.778	0.2705
CR*Z	0.005709	0.008582	0.66528	0.5088
DER*Z	0.011544	0.03791	0.304505	0.762
LN*Z	-0.016083	0.015476	-1.039.162	0.3035

H1: Liquidity, solvency, and firm size simultaneously affect financial performance.

The F- The test findings indicate that the p-value is < 0.05 (0.000615 < 0.05). By rejecting H₀ and accepting H_a, Therefore, it can be said that H₁ is accepted, meaning that liquidity, solvency, and company Size has an important impact on financial performance (ROA). The results show that

A business's financial results is greatly affected by the scale of operations and short- and long-term financial health. This study is consistent with signaling idea, which says that businesses will demonstrate their value and future prospects to the market. In this situation, liquidity helps investors believe that the business can manage its short-term obligations well, indicating good business health. Well-controlled solvency indicates long-term stability and the company's ability to withstand financial pressure, which significantly reduces the perception of risk for creditors and shareholders. Finally, company size is often considered an indicator of market strength and dominance, suggesting that larger companies tend to have competitive advantages and greater access to resources.

H2: Liquidity Affects Financial Performance.

The t-test results show that the p-value >0.05 ($0.4247 > 0.05$). Therefore, it can be said that H_a is rejected and H_0 is accepted, indicating that H2 is rejected or liquidity (CR) does not significantly affect financial performance (ROA). This finding shows that liquidity theoretically does not affect financial performance (ROA) in this study. These results are in line with the work of Nassim and Benraïss (2024). In their study, they found that certain financial ratios, such as short-term and total debt, did not have a significant correlation with financial performance (ROA), even though theoretically there should be. This study supports the idea that other elements, such as government subsidies or specific business features, may disrupt or even override the expected relationship between financial ratios and performance. This is similar to what happens with the liquidity variable.

H3: Solvency Affects Financial Performance.

Agency theory is concerned with the connection between shareholders (fundamentals) and management (Actors). This theory argues that conflicts of interest may arise because management's objectives may not be aligned with those of shareholders. The t-test findings allow for the conclusion of that solvency (DER) has a significant impact on financial performance (ROA). Previous studies have also examined this relationship, supporting these findings. According to research conducted by Vrbka, R. (2020), solvency and financial ratios, as measured by ROA, greatly affect business performance.

H4: Firm Size Affects Financial Performance.

The number of companies (Ln Asset) has no appreciable effect on financial performance. (ROA), according to the t-test results, with a p-value >0.05 ($0.0727 > 0.05$). H_0 is accepted, H_a is rejected, and H4 is rejected, according to the conclusion. Theoretically, larger companies are usually considered a good signal because they indicate dominance and stability in the market. In addition, large companies have better access to financial resources, technology, and markets, according to Chen and Chen (2011). Previous research findings support this finding. A study conducted by Singh and Singh (2020) looked at the Indian manufacturing industry and found showed the profitability of the company was not significantly impacted by its size.

H5: Downstreaming Policy Moderates the Interaction Between Liquidity and Financial Performance.

Based on the results of the moderation regression analysis conducted on the interaction between variable X1 liquidity (Current Ratio) and variable Y financial performance (ROA) and moderation Z (Downstreaming), which produced a p-value greater than 0.05 ($p\text{-value} = 5088 > 0.05$), it is possible to determine that variable Z (Downstreaming) has no discernible impact and cannot moderate or strengthen the effect of liquidity (Current Ratio) on financial performance (Institutional theory states that companies often adopt practices or policies to gain legitimacy from the external environment, such as the government or society. This study is in line with this theory. One example of institutional pressure is the downstreaming policy. Previous studies have also examined the moderating effect, supporting this finding. A study by Dinh and Pham (2021) found that The connection between corporate social responsibility and financial performance is not always significant due to the moderating effect of external elements such as state ownership).

H6: Downstreaming Policy Moderates the Interaction Between Solvency and Financial Performance

As a result of the moderation interaction regression analysis of variable X2 solvency (DER) on variable Y financial performance (ROA) with moderation Z (downstreaming policy), with a p-value greater than 0.05 ($0.6620 > 0.05$). Thus, it may be said that the variable Z (downstreaming policy) no significant effect and cannot moderate or strengthen the influence of solvency (DER) on financial result (ROA). Study corresponds with signaling theory, which states that companies show their value and future prospects to the market. Solvency (DER) is strong evidence that companies in this situation have stable finances. The market does not seem to view downstreaming policy (Z) as a component that strengthens or weakens the solvency signal. These findings are consistent with the study conducted by Vrbka, R. (2019). According to their research, financial ratios, including solvency, possess a substantial effect on business performance using return on assets as a metric (ROA).

H7: Downstreaming Policy Moderates the Interaction Between Firm Size and Financial Performance

According to the results of the moderation regression analysis conducted on variable X3, company size (Ln Asset), with variable Y, financial performance (ROA), and moderation Z (downstreaming policy), with a p-value greater than 0.05 ($0.3035 > 0.05$), it can be concluded that variable Z (downstreaming policy) has no discernible impact and cannot moderate or strengthen The impact of corporate size (Ln Asset) on financial performance. The outcomes of the moderation regression analysis conducted on variable X3 company size (Ln Asset), the Y variable of financial performance (ROA), and the moderating variable Z (downstreaming policy), with a p-value greater than 0.05 ($0.3035 > 0.05$), indicate that the Z variable (downstreaming policy) has no appreciable impact on the financial performance of the company (Ln Asset).

3. CONCLUSION & SUGGESTION

These findings on moderating effects (H5, H6, and H7) are consistent with Institutional Theory, which states that government policies, such as downstreaming, can function as institutional pressures that encourage companies to comply, rather than as financial drivers that directly alter the

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relationship between financial variables and performance. It may be better to view these policies as distinct strategic efforts rather than as components that regulate fundamental financial relationships. Considering the findings of the study, the following suggestions can be made:

Government: In order for the downstreaming policy to be implemented effectively and have a favorable effect on business performance, all companies involved in nickel mining and processing, both state-owned and non-state-owned, must receive financial incentives or more targeted support. In order for companies to incorporate this policy into their financial management plans, the government may also consider providing further socialization.

For Companies: Since solvency management has been proven to improve financial performance, management should give it top priority. Although company size and liquidity do not have a significant impact, companies should still maintain a high level of liquidity and be cautious about the costs associated with company growth. not have a significant impact.

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