



JOURNAL

The Effect of Capital Structure, Cash Holdings, and Diversification Strategy on Financial Performance with Commodity Price Volatility as a Moderating Variable

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Abstract:

This study aims to analyze the effect of capital structure, cash holdings, and diversification strategy on financial performance, and to examine the role of commodity price volatility as a moderating variable. The sampling technique used is non-probability sampling with a purposive sampling approach. The data used are secondary data sourced from the annual financial reports of metal and mineral subsector companies listed on the Indonesia Stock Exchange for the period 2021–2024. The analysis technique employed is panel regression Fixed Effect Model (FEM) with Moderated Regression Analysis (MRA) using Eviews 12. The study found that capital structure and diversification strategy negatively affect financial performance, while cash holdings have no significant effect on financial performance. Furthermore, commodity price volatility does not moderate the relationship between capital structure, cash holdings, and diversification strategy and financial performance. This study implies that optimizing the management of internal resources plays a more important role in improving the financial performance of metal and mineral subsector companies than external factors. thereby reinforcing the relevance of the Resource-Based View (RBV) and providing insights for managerial, investment, and policy decision-making. Future research may expand the sample coverage and observation period, as well as adopt alternative approaches to measuring diversification strategy and commodity price volatility

Keywords: Capital Structure, Cash Holdings, Diversification Strategy, Financial Performance, Commodity Price Volatility, Metal and Mineral Industry.

BACKGROUND

Financial performance is an important indicator used to assess a company's ability to manage its resources in order to generate profits and create value for shareholders. One of the measures commonly used to evaluate financial performance is Return on Equity (ROE), as this ratio reflects a company's ability to generate profits based on the capital invested by shareholders (Brigham & Houston, 2022). A high ROE indicates the company's effectiveness in managing its resources and capital, whereas a low ROE suggests problems in financial and operational management.



The metals and minerals subsector is one of the strategic subsectors within the basic materials sector that makes a significant contribution to the Indonesian economy. The development of the electric vehicle, renewable energy, and technology-based manufacturing industries has increased global demand for metal commodities such as nickel, copper, and gold (Wakelin, 2023). In addition, the downstream industrialization policy implemented by the Indonesian government has encouraged increased investment and production capacity among companies in this subsector. However, this increase in business activities has also been accompanied by substantial financing requirements, greater operational complexity, and higher exposure to external risks (Perdana, 2025).

Although the metals and minerals subsector has experienced significant growth, this condition has not always been accompanied by improvements in corporate financial performance. The average ROE of metals and minerals companies listed on the Indonesia Stock Exchange during the 2021–2024 period showed a declining trend, decreasing from 7.76% in 2021 to 2.59% in 2024. This decline indicates that companies' ability to generate profits for shareholders has weakened and has not yet demonstrated adequate stability. A similar condition was also observed in several companies, including PT Krakatau Steel (Persero) Tbk, PT Kapuas Prima Coal Tbk, and PT Saranacentral Bajatama Tbk, which experienced significant declines in ROE during the observation period.

The decline in corporate financial performance may be influenced by various internal and external factors. Internal factors frequently examined in financial research include capital structure, cash holdings, and diversification strategy. Capital structure reflects a company's decision regarding the composition of financing between debt and equity. Excessive use of debt has the potential to increase financial burdens, thereby reducing corporate profitability (Islam & Iqbal, 2022; Partiwi & Herawati, 2022). Nevertheless, several studies suggest that capital structure can provide benefits through financing optimization and improved corporate efficiency (Mansour et al., 2022).

In addition to capital structure, cash holdings also play a role in determining corporate financial performance. An adequate level of cash holdings can enhance financial flexibility and a company's ability to cope with business uncertainty (Marsadu et al., 2024). However, excessive cash holdings may also lead to inefficiency if they are not utilized productively (Aluora et al., 2025). On the other hand, diversification strategy is viewed as a company's effort to reduce risk by expanding into multiple business segments. This strategy is expected to maintain the stability of corporate income, although its effectiveness largely depends on the company's ability to manage increasing business complexity (Hutauruk & Yanti, 2025).

In addition to internal factors, companies in the metals and minerals subsector also face external factors in the form of commodity price volatility. Fluctuations in global commodity prices can significantly affect corporate revenues, production costs, and profitability (Agustina et al., 2024). Companies operating in commodity-based industries are highly sensitive to changes in market prices; therefore, commodity price volatility has the potential to strengthen or weaken the influence of financial policies and corporate strategies on financial performance (Selvita & Mahayastina, 2025).



Previous studies indicate that the relationships among capital structure, cash holdings, diversification strategy, and financial performance have produced mixed findings. Several studies have found that capital structure and cash holdings influence financial performance, whereas others have reported different results (Islam & Iqbal, 2022; Marsadu et al., 2024; Partiwi & Herawati, 2022). Likewise, the effectiveness of diversification strategy in improving financial performance remains inconclusive. Furthermore, studies examining the moderating role of commodity price volatility are still relatively limited and generally focus on specific commodities, thereby providing no comprehensive understanding of the metals and minerals subsector in Indonesia.

Based on these phenomena, there remains an evidence gap regarding the effects of capital structure, cash holdings, and diversification strategy on financial performance while considering commodity price volatility as an external factor representing uncertainty in the business environment. Therefore, this study aims to analyze the effects of capital structure, cash holdings, and diversification strategy on financial performance and to examine the moderating role of commodity price volatility in companies within the metals and minerals subsector listed on the Indonesia Stock Exchange during the 2021–2024 period.

THEORETICAL FRAMEWORK

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) was founded by Wernerfelt (1984) and developed by Barney (1991), who argues that a company's competitive advantage and performance are determined by its ability to manage resources that are valuable, rare, inimitable, and non-substitutable. In this study, RBV is employed to explain that capital structure, cash holdings, and diversification strategy represent internal resources and capabilities that can influence a company's financial performance. Furthermore, commodity price volatility, as an external factor, may affect the effectiveness of utilizing these resources in achieving optimal financial performance.

Capital Structure

Capital structure refers to the combination of financing sources derived from debt and equity used by a company to finance its operational activities and long-term investments. It reflects the company's policy in determining the proportion of internal and external financing to achieve financing efficiency and improve corporate performance (Brigham & Houston, 2022).

Cash Holdings

Cash holdings refer to the amount of cash and cash equivalents held by a company to meet operational requirements, finance investments, and cope with uncertainty in the business environment. An adequate level of cash holdings can enhance a company's financial flexibility, whereas excessive cash holdings may lead to inefficiencies in resource utilization (Gill & Shah, 2012).



Diversification Strategy

Diversification strategy refers to a company's effort to expand its business activities through the development of new products, markets, or business segments in order to reduce risk and increase long-term growth opportunities. Diversification is expected to create income stability and enhance a company's ability to respond to changes in the business environment (Hutauruk & Yanti, 2025).

Financial Performance

Financial performance reflects a company's ability to generate profits and manage its resources effectively and efficiently. In this study, financial performance is proxied by Return on Equity (ROE), which measures a company's ability to generate net income based on the capital invested by shareholders (Brigham & Houston, 2022).

Commodity Price Volatility

Commodity price volatility refers to the degree of fluctuation in commodity prices over a given period, reflecting the level of market uncertainty. Changes in commodity prices may affect a company's revenue, production costs, and profitability, particularly for companies operating in commodity-based industries such as the metals and minerals subsector (Agustina et al., 2024).

Hypothesis Development

H1: Capital structure has a negative effect on financial performance.

H2: Cash holdings have a positive effect on financial performance.

H3: Diversification strategy has a positive effect on financial performance.

H4: Commodity price volatility strengthens the negative effect of capital structure on financial performance.

H5: Commodity price volatility strengthens the positive effect of cash holdings on financial performance.

H6: Commodity price volatility strengthens the positive effect of diversification strategy on financial performance.

METHOD

This study employed a quantitative approach using secondary data obtained from the financial statements of metals and minerals subsector companies listed on the Indonesia Stock Exchange (IDX) for the 2021–2024 period, as well as commodity price data obtained from the World Bank Commodity Price Data (Pink Sheet). The unit of analysis in this study was metals and minerals subsector companies listed on the IDX. The sample was selected using a purposive sampling technique based on predetermined criteria established by the researcher, resulting in 25 companies with a total of 100 observations. From that total of observations, 2 of them are trimmed to eliminate outliers. Data were analyzed using descriptive statistics, panel



data model selection, and Moderated Regression Analysis (MRA) with the assistance of EViews 12 software to examine the effects of capital structure, cash holdings, and diversification strategy on financial performance, with commodity price volatility serving as the moderating variable.

RESULT

Descriptive Statistics

Table 1. Descriptive Statistic Output

Date: 06/06/26

Time: 16:55

Sample: 2021 2024

	ROE	DER	CH	DIV
Mean	0.074273	1.409809	0.116377	0.141447
Median	0.086450	0.769550	0.086094	0.000000
Maximum	0.442741	11.33000	0.930432	0.710359
Minimum	-0.991505	0.007428	0.001386	0.000000
Std. Dev.	0.185325	1.783350	0.144094	0.202241
Skewness	-2.355983	2.598943	3.173324	1.224674
Kurtosis	13.83608	12.02343	15.69536	3.277929
Jarque-Bera	570.1281	442.7977	822.5960	24.81259
Probability	0.000000	0.000000	0.000000	0.000004
Sum	7.278720	138.1613	11.40495	13.86176
Sum Sq. Dev.	3.331490	308.4928	2.014008	3.967428
Observations	98	98	98	98

	VOL	DERXVOL	CHXVOL	DIVXVOL
Mean	0.234820	0.347523	0.028408	0.025396
Median	0.196176	0.153734	0.015159	0.000000
Maximum	0.546925	2.969803	0.359350	0.242265
Minimum	0.092248	0.002289	0.000381	0.000000
Std. Dev.	0.136355	0.546026	0.047841	0.041463
Skewness	1.109077	2.971187	4.464539	2.298847
Kurtosis	3.166790	12.49749	27.44149	9.933785
Jarque-Bera	20.20443	512.5157	2764.886	282.6327
Probability	0.000041	0.000000	0.000000	0.000000
Sum	23.01237	34.05722	2.783963	2.488798
Sum Sq. Dev.	1.803481	28.91997	0.222010	0.166759
Observations	98	98	98	98

Source: Eviews 12 Output (2026)

1. Based on the descriptive statistics results, the financial performance variable (ROE) has a mean value of 0.0743 (7.43%) and a standard deviation of 0.1853. The standard deviation, which is higher than the mean, indicates that the financial performance of metals and



minerals subsector companies during the study period exhibited a relatively high level of variation.

2. The capital structure variable (DER) has a mean value of 1.4098 and a standard deviation of 1.7834. This indicates that the level of debt utilization varies across companies, reflecting substantial differences in financing policies within the metals and minerals subsector.
3. The cash holdings variable (CH) has a mean value of 0.1164 and a standard deviation of 0.1441. These values indicate that the proportion of cash held by companies varies considerably, reflecting differences in liquidity management policies across firms.
4. The diversification strategy variable (DIV) has a mean value of 0.1414 and a standard deviation of 0.2022. This condition indicates that most companies still maintain relatively low levels of diversification, although several firms have implemented broader business diversification than others.
5. The commodity price volatility variable (VOL) has a mean value of 0.2348 and a standard deviation of 0.1364. These results indicate that the level of commodity price fluctuations experienced by companies during the study period was moderate, with relatively limited variation across observations.
6. The interaction variable between capital structure and commodity price volatility (DER×VOL) has a mean value of 0.3475 and a standard deviation of 0.5460. The standard deviation, which exceeds the mean, indicates that the combined effect of these two variables varies considerably across companies.
7. The interaction variable between cash holdings and commodity price volatility (CH×VOL) has a mean value of 0.0284 and a standard deviation of 0.0478. These results indicate that the combination of cash holdings and commodity price volatility is relatively low; however, differences still exist among companies in responding to the risk of commodity price fluctuations.
8. The interaction variable between diversification strategy and commodity price volatility (DIV×VOL) has a mean value of 0.0254 and a standard deviation of 0.0415. This indicates that most companies exhibit relatively low levels of interaction, although several firms demonstrate higher levels of diversification under varying levels of commodity price volatility.

Panel Model Selection

Table 2. Panel Model Selection Tests

Test	Statistic/Indicator	Value	Decision
Chow Test	Cross-section F Probability	0.000	Fixed Effect Model
Haussman Test	Cross-section random probability	0.0001	Fixed Effect Model

Source: Processed by the author (2026)

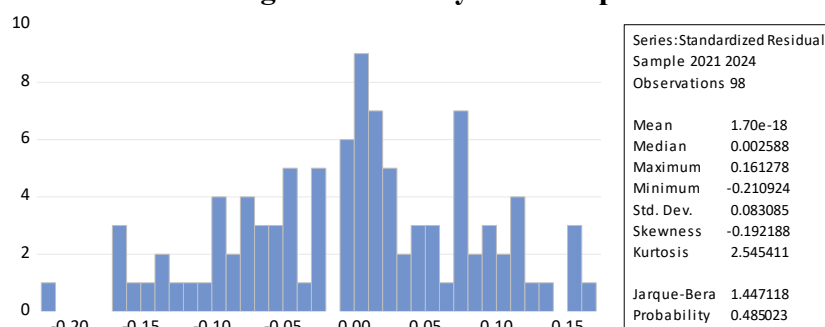
Based on the model selection tests, the Fixed Effect Model (FEM) was selected as the most appropriate panel data model for this study. The Chow test produced a cross-section F probability of 0.000, indicating that the Fixed Effect Model is preferred over the Common



Effect Model. Furthermore, the Hausman test yielded a cross-section random probability of 0.0001, confirming that the Fixed Effect Model is more appropriate than the Random Effect Model. Therefore, all subsequent analyses were conducted using the Fixed Effect Model.

Normality Test

Image 1. Normality Test Output



Source: Eviews 12 output (2026)

The normality test was conducted using the Jarque–Bera test, where the residuals are considered to be normally distributed if the probability value exceeds 0.05. Based on the Jarque–Bera test results, the probability value was 0.4850. Since the probability value is greater than 0.05, it can be concluded that the residuals in this study are normally distributed, indicating that the normality assumption has been satisfied.

Multicollinearity Test

Table 3. Multicollinearity Test Output

	DER	CH	DIV
DER	1.000000	-0.094244	0.254092
CH	-0.094244	1.000000	-0.144692
DIV	0.254092	-0.144692	1.000000
VOL	0.068434	0.055540	-0.286448
DERXVOL	0.858305	-0.078226	0.113374
CHXVOL	-0.067473	0.760414	-0.203395
DIVXVOL	0.351757	-0.149684	0.839984

	VOL	DERXVOL	CHXVOL	DIVXVOL
DER	0.068434	0.858305	-0.067473	0.351757
CH	0.055540	-0.078226	0.760414	-0.149684
DIV	-0.286448	0.113374	-0.203395	0.839984
VOL	1.000000	0.391331	0.439642	0.001871
DERXVOL	0.391331	1.000000	0.031289	0.336480
CHXVOL	0.439642	0.031289	1.000000	-0.128810
DIVXVOL	0.001871	0.336480	-0.128810	1.000000

Source: Eviews 12 output (2026)



Multicollinearity was assessed by examining the correlation coefficients among the independent variables. The regression model is considered free from multicollinearity if the correlation coefficient between variables is less than 0.90 (Hair Jr. et al., 2022). Based on the test results, all correlation coefficients among the independent variables and interaction terms were below 0.90. Therefore, it can be concluded that the research model is free from multicollinearity and is appropriate for further analysis.

Heterokedasticity Test

Table 4. Heterokedasticity Test Output

Dependent Variable: ABS_RES

Method: Panel Least Squares

Date: 06/06/26 Time: 13:24

Sample: 2021 2024

Periods included: 4

Cross-sections included: 25

Total panel (unbalanced) observations: 98

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.044212	0.023556	1.876856	0.0650
DER	0.006149	0.008073	0.761634	0.4490
CH	0.057541	0.090495	0.635853	0.5271
DIV	-0.058153	0.074175	-0.783998	0.4358
VOL	0.023833	0.071039	0.335492	0.7383
DERXVOL	0.018019	0.026231	0.686945	0.4945
CHXVOL	-0.075388	0.232466	-0.324298	0.7467
DIVXVOL	0.189192	0.303176	0.624032	0.5348

Source: Eviews 12 output (2026)

Heteroskedasticity was tested using the Glejser method by regressing the absolute residual values on the independent variables. The test results showed that all variables had probability values greater than 0.05, namely DER (0.4490), CH (0.5271), DIV (0.4358), VOL (0.7383), DER×VOL (0.4945), CH×VOL (0.7467), and DIV×VOL (0.5348). Therefore, it can be concluded that the regression model does not exhibit heteroskedasticity and is appropriate for further analysis.

Autocorrelation Test

Table 5. Autocorrelation Test Output

Effects Specification			
Cross-section fixed (dummy variables)			
Root MSE	0.082660	R-squared	0.799007
Mean dependent var	0.074273	Adjusted R-squared	0.704601
S.D. dependent var	0.185325	S.E. of regression	0.100725
Akaike info criterion	-1.495093	Sum squared resid	0.669607
Schwarz criterion	-0.651022	Log likelihood	105.2596
Hannan-Quinn criter.	-1.153684	F-statistic	8.463521
Durbin-Watson stat	2.506775	Prob(F-statistic)	0.000000



Source: Eviews 12 Output (2026)

Autocorrelation was assessed using the Durbin–Watson (DW) statistic. The test results produced a DW value of 2.5068, with a corresponding 4 – DW value of 1.4932, indicating a very weak negative autocorrelation. However, since this study employed panel data and autocorrelation is not a mandatory classical assumption in panel data regression analysis (Napitupulu et al., 2021), the regression model was considered appropriate for further analysis.

Moderated Regression Analysis Test

Table 6. Moderated Regression Analysis Test

Dependent Variable: ROE

Method: Panel Least Squares

Date: 06/06/26 Time: 13:26

Sample: 2021 2024

Periods included: 4

Cross-sections included: 25

Total panel (unbalanced) observations: 98

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.302776	0.055144	5.490665	0.0000
DER	-0.152310	0.018899	-8.059117	0.0000
CH	0.086214	0.211841	0.406973	0.6853
DIV	-0.405238	0.173637	-2.333824	0.0227
VOL	0.082263	0.166296	0.494679	0.6225
DERXVOL	0.086040	0.061403	1.401217	0.1658
CHXVOL	-0.103496	0.544183	-0.190186	0.8497
DIVXVOL	-0.502664	0.709709	-0.708267	0.4813

Effects Specification			
Cross-section fixed (dummy variables)			
Root MSE	0.082660	R-squared	0.799007
Mean dependent var	0.074273	Adjusted R-squared	0.704601
S.D. dependent var	0.185325	S.E. of regression	0.100725
Akaike info criterion	-1.495093	Sum squared resid	0.669607
Schwarz criterion	-0.651022	Log likelihood	105.2596
Hannan-Quinn criter.	-1.153684	F-statistic	8.463521
Durbin-Watson stat	2.506775	Prob(F-statistic)	0.000000

Source: Eviews 12 output (2026)

Based on the regression estimation using the Fixed Effect Model (FEM), the results indicate that the capital structure variable (DER) has a negative coefficient, suggesting that an increase in DER tends to reduce financial performance (ROE). The cash holdings variable (CH) has a positive coefficient, indicating that higher cash holdings tend to improve ROE. Meanwhile, the diversification variable (DIV) has a negative coefficient, implying that greater diversification tends to reduce ROE. The commodity price volatility variable (VOL) exhibits a relatively small effect on ROE. Furthermore, the interaction terms DER×VOL, CH×VOL, and DIV×VOL display different coefficient directions, indicating that commodity price volatility



exerts varying moderating effects on the relationships between the independent variables and the company's financial performance.

Partial Test (t-test)

Based on the results of the t-test, the capital structure variable (DER) has a significant negative effect on financial performance ($\beta = -0.1523$; $p = 0.0000$); therefore, H1 is supported. Cash holdings (CH) do not have a significant effect on financial performance ($\beta = 0.0862$; $p = 0.6853$); therefore, H2 is not supported. The diversification strategy (DIV) has a significant negative effect on financial performance ($\beta = -0.4052$; $p = 0.0227$); therefore, H3 is not supported because the direction of the effect is inconsistent with the proposed hypothesis. Furthermore, the interaction terms DER $\times$ VOL ($\beta = 0.0860$; $p = 0.1658$), CH $\times$ VOL ($\beta = -0.1034$; $p = 0.8497$), and DIV $\times$ VOL ($\beta = -0.5026$; $p = 0.4813$) do not exhibit significant effects. These findings indicate that commodity price volatility does not moderate the relationships between capital structure, cash holdings, or diversification strategy and financial performance. Accordingly, H4, H5, and H6 are not supported.

Simultaneous Test (F-test)

Based on the results of the F-test, the model produced an F-statistic of 8.4635 with a Prob(F-statistic) value of 0.0000, which is lower than the 0.05 significance level. These results indicate that capital structure, cash holdings, diversification strategy, commodity price volatility, and the interaction terms jointly have a significant effect on financial performance. Therefore, the regression model is considered statistically significant (fit) and appropriate for hypothesis testing.

Coefficient of Determination (R² Test)

The coefficient of determination results show an R-squared value of 0.7990 and an Adjusted R-squared value of 0.7046. These findings indicate that capital structure, cash holdings, diversification strategy, commodity price volatility, and the interaction terms collectively explain 70.46% of the variation in corporate financial performance, while the remaining 29.54% is explained by factors outside the research model. Therefore, the model demonstrates relatively strong explanatory power with respect to the dependent variable.

DISCUSSION

Effect of Capital Structure on Financial Performance

The results of this study indicate that capital structure, proxied by the Debt-to-Equity Ratio (DER), has a significant negative effect on corporate financial performance. The result indicates that a higher proportion of debt in a firm's capital structure tends to reduce its financial performance.

Based on the analysis, the negative effect of capital structure on financial performance may be attributed to the increasing interest expenses and debt repayment obligations associated with higher leverage. These financial burdens reduce a firm's financial flexibility and limit its



ability to generate profits. This finding is also consistent with the Resource-Based View (RBV), which argues that financial resources must be managed efficiently to create value. Excessive reliance on debt may constrain a firm's ability to optimize its available resources, thereby leading to a decline in financial performance.

These findings are consistent with those reported by Buhaenah & Pradana (2022), Islam & Iqbal (2022), Marsadu et al. (2024) and Partiwi & Herawati (2022), all of whom found that leverage has a significant negative effect on corporate performance. Therefore, it can be concluded that increasing the use of debt without effective financial management tends to reduce a firm's financial performance.

Effect of Cash Holdings on Financial Performance

The results of this study indicate that cash holdings (CH) do not have a significant effect on corporate financial performance. Result indicates that the level of cash holdings does not significantly influence corporate financial performance, although the relationship is positive.

Based on the analysis, the insignificant effect of cash holdings on financial performance may be attributed to the suboptimal utilization of corporate cash for activities capable of enhancing profitability. Although high cash holdings provide financial flexibility and enable firms to cope with business uncertainty, cash that is not managed productively becomes an idle resource and does not directly contribute to improving financial performance. From the Resource-Based View (RBV) perspective, cash represents a financial resource that can generate competitive advantage only when it is effectively utilized to support operational activities and corporate investments. This condition is also reflected in several companies within the sample that maintained high cash holdings without experiencing corresponding improvements in Return on Equity (ROE).

These findings are generally consistent with those reported by Aluora et al. (2025) Cindy & Keristin (2025), Marsadu et al. (2024), who observed a positive tendency in the relationship between cash holdings and corporate financial performance. Therefore, high cash holdings alone do not necessarily improve financial performance unless accompanied by effective cash management and utilization.

Effect of Diversification Strategy on Financial Performance

The findings indicate that the diversification strategy, proxied by the Herfindahl–Hirschman Index (HHI), has a significant negative effect on corporate financial performance. Result are indicating that a higher level of diversification tends to reduce financial performance as measured by ROE.

Based on the analysis, the negative effect of diversification strategy on financial performance may be attributed to increased operational complexity, coordination costs, and greater resource management requirements as firms expand into multiple business segments. Diversification that is not supported by adequate organizational capabilities and managerial competence may create inefficiencies, preventing the expected benefits from outweighing the additional costs incurred. From the RBV perspective, diversification generates competitive advantage only when firms are capable of effectively managing and integrating their available



resources. This condition is also reflected in several companies within the sample that experienced higher levels of diversification accompanied by declining ROE during the observation period.

These findings are inconsistent with those of Hadi (2022) and Nurridwan (2025) who reported a positive effect of diversification on corporate financial performance. However, the findings are consistent with Satoto (2009) who argued that diversification does not always create additional value and may even reduce performance due to greater complexity and resource management inefficiency. Therefore, greater diversification does not necessarily improve corporate financial performance.

Effect of Capital Structure on Financial Performance with Commodity Price Volatility as a Moderating Variable

The results indicate that commodity price volatility does not moderate the relationship between capital structure and corporate financial performance. Results are indicating that commodity price volatility neither strengthens nor weakens the effect of capital structure on financial performance measured by ROE.

Based on the analysis, the insignificant moderating effect of commodity price volatility may be explained by the dominant role of internal corporate factors in determining the effectiveness of debt utilization compared with external factors such as commodity price fluctuations. Although commodity price changes may affect business conditions, their impact is insufficient to significantly alter the relationship between capital structure and financial performance. From the RBV perspective, commodity price volatility is an external factor that may influence the utilization of corporate resources. However, the ability to manage financial resources and internal risks appears to have a greater influence on financial performance than changes in commodity market conditions. This condition is also reflected in several companies within the sample that exhibited different patterns between the DER×VOL interaction values and ROE during the observation period.

These findings are consistent with Pahima (2024), who reported that commodity prices do not moderate the relationship between capital structure and profitability. However, the results differ from those of Salsabila & Widajatun (2025), who found that commodity price volatility strengthens the effect of capital structure on profitability. Therefore, the effect of capital structure on the financial performance of metals and minerals subsector companies appears to be determined primarily by internal corporate factors rather than commodity price volatility.

Effect of Cash Holdings on Financial Performance with Commodity Price Volatility as a Moderating Variable

The results indicate that commodity price volatility does not moderate the relationship between cash holdings and corporate financial performance. The result indicates that commodity price volatility neither strengthens nor weakens the effect of cash holdings on financial performance measured by ROE.

Based on the analysis, the insignificant moderating effect of commodity price volatility may be attributed to the fact that cash management is driven more by firms' operational



requirements and internal strategies than by changes in commodity prices. Although cash is a resource that can help firms respond to business uncertainty, companies do not appear to adjust their cash holding policies specifically in response to commodity price fluctuations. From the RBV perspective, cash is a financial resource capable of creating competitive advantage when managed effectively. However, the insignificant moderating effect suggests that cash holdings among metals and minerals subsector companies have not been strategically utilized to respond to commodity price volatility. This condition is also reflected in several companies within the sample that exhibited inconsistent relationships between $CH \times VOL$ interaction values and ROE throughout the observation period.

These findings are inconsistent with those of Alomran & Alsubaiei (2022) and also Bugshan (2022), who reported that environmental uncertainty strengthens the benefits of cash holdings on corporate performance. Therefore, the effect of cash holdings on the financial performance of metals and minerals subsector companies appears to be influenced more by internal resource management than by commodity price volatility.

Effect of Diversification Strategy on Financial Performance with Commodity Price Volatility as a Moderating Variable

The results indicate that commodity price volatility does not moderate the relationship between diversification strategy and corporate financial performance. Results are indicating that commodity price volatility neither strengthens nor weakens the effect of diversification strategy on financial performance measured by ROE.

Based on the analysis, the insignificant moderating effect of commodity price volatility may be explained by the limited implementation of diversification strategies among metals and minerals subsector companies. Most firms in the sample maintained relatively low levels of diversification or did not diversify at all, preventing them from fully realizing the benefits of diversification in coping with commodity price fluctuations. From the RBV perspective, diversification represents the utilization and integration of resources across multiple business segments to create sustainable competitive advantage. However, the insignificant moderating effect suggests that firms' capabilities to integrate and manage resources across business segments remain insufficient for commodity price volatility to influence the relationship between diversification and financial performance. This condition is also reflected in several companies within the sample that exhibited inconsistent relationships between $DIV \times VOL$ interaction values and ROE during the observation period.

These findings are consistent with Putra et al. (2021), who concluded that diversification strategies are not necessarily effective in mitigating risks arising from commodity price volatility and therefore do not significantly affect corporate performance. However, the results differ from those of Wegwu (2020), who found that diversification improves corporate performance through risk dispersion and broader business opportunities. Therefore, the effectiveness of diversification strategies among metals and minerals subsector companies appears to depend more on firms' ability to manage their resources and business activities than on commodity price volatility as an external factor.



CONCLUSION

Based on the findings of this study, it can be concluded that capital structure has a significant negative effect on the financial performance of companies in the metals and minerals subsector, whereas cash holdings do not have a significant effect. Diversification strategy is also found to have a significant negative effect on financial performance. Furthermore, commodity price volatility does not moderate the relationships between capital structure, cash holdings, or diversification strategy and corporate financial performance. Overall, the financial performance of metals and minerals subsector companies during the 2021–2024 period is influenced more by financing decisions and diversification strategies than by commodity price volatility as a moderating variable.

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