



THE EFFECT OF CASH CONVERSION CYCLE AND FREE CASH FLOW ON STOCK RETURN WITH EXCHANGE RATE AS MODERATING VARIABLE IN COAL MINING COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE, 2022–2024

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ABSTRACT

Introduction: This study aims to examine the effect of the Cash Conversion Cycle (CCC) and Free Cash Flow (FCF) on stock returns, and to analyze the moderating role of the Rupiah/US Dollar (IDR/USD) exchange rate on both relationships, using coal mining companies listed on the Indonesia Stock Exchange during the 2022–2024 period as the object of study.

Methods: A quantitative approach was applied using balanced panel data covering 22 issuers and 66 observations. The first and second hypotheses were tested through panel data regression with the Fixed Effect Model (FEM) using the Panel EGLS Cross-section Weights method, while the third and fourth hypotheses were tested using Moderated Regression Analysis (MRA); model selection was based on the Chow Test and Hausman Test, complemented by classical assumption tests for normality, multicollinearity, and heteroscedasticity.

Results: The estimation results show that CCC has a negative and highly significant effect on stock returns, indicating that a more efficient cash conversion cycle corresponds to higher returns received by investors. FCF is proven to have a positive and significant effect, confirming that strong free cash flow serves as a positive signal to the market. The exchange rate negatively moderates both relationships: depreciation of the Rupiah intensifies the negative impact of a long CCC due to rising foreign-currency-denominated operating costs, while high exchange rate uncertainty leads investors to demand a higher risk premium, thereby weakening the positive effect of FCF on stock returns.

Conclusion and suggestion: These findings underscore the importance of integrating internal efficiency factors and macroeconomic risk into investment strategy and financial management in the coal mining sector.

INTRODUCTION

Amid a global economic slowdown, Indonesia's economy still recorded growth of 5.03% in 2024, with per capita income reaching IDR 78.61 million per year, while the Rupiah's middle exchange rate against the US Dollar stood at IDR 16,162 and the unemployment rate declined to 5.2% of the total population of 281 million (ESDM, 2024).

The coal mining industry is one of the largest contributors to Indonesia's foreign exchange earnings (Irham et al., 2024). National coal production reached 836 million tons in 2024 with an export value of USD 42.7 billion, positioning Indonesia as the world's fifth-largest coal exporter, contributing approximately 3.2% to national GDP, and absorbing more than 250,000 workers (ESDM, 2024; APBI, 2024). Nevertheless, the performance of this sector is highly vulnerable to volatile external variables; Putri and Nugroho (2024) emphasize that movements in mining-sector stock prices cannot be separated from domestic and global monetary dynamics, which underlies the selection of the exchange rate as a moderating variable in this study.

During 2016–2024, national coal production volume tended to increase consistently, from 775 million tons in 2023 to 836 million tons in 2024, precisely as world reference prices underwent a sharp normalization from a peak of around USD 280/ton in 2022 to USD 201.15/ton in 2023 and USD 121/ton in 2024. This condition of high volume but low prices requires mining companies to accelerate working-capital management through a more efficient Cash Conversion Cycle (CCC) to maintain liquidity amid shrinking profit margins (Rorlen et al., 2023). The same price decline also tests the resilience of companies' Free Cash Flow (FCF): although export volume rose from 518 million tons (2023) to 555 million tons (2024), net revenue per ton actually declined. The ability to maintain positive FCF amid a downward price trend becomes an important signal for investors in determining stock returns (Saskiah & Asmedi, 2025), while failure to maintain healthy FCF risks eroding market confidence (Suwaldiman, 2018). The availability of FCF also gives management strategic flexibility to enhance investment attractiveness and reduce information asymmetry with investors, particularly in capital-intensive industries such as coal mining (Safitri, 2018).

Export dominance reaching 218 million tons in 2023 illustrates the substantial exposure of coal companies' revenue to exchange-rate risk. Depreciation of the Rupiah against the USD tends to bolster the beneficial link between FCF and share price returns through an increase in the converted value of export revenue (Sandi et al., 2024), while appreciation of the Rupiah when world coal prices are under pressure accelerates the negative impact on financial performance and stock returns (Fitrianur et al., 2025). Stock return itself is the most fundamental indicator of investment performance for capital-market investors, reflecting both capital gain and dividends (Qotimah et al., 2023; L. Susanti et al., 2024) and demonstrating a firm's capacity to generate incremental value for equity holders (Purba & Juliartini, 2025; Setiawan & Dewi, 2024).

At the global level, Chen et al.'s (2022) study found that CCC has predictive power for stock returns, with a Low-minus-High hedge portfolio generating statistically meaningful Fama-French five-factor monthly alphas spanning 0.277% to 0.730%. CCC itself measures a company's efficiency in converting inventory and receivables into cash through three primary operational stages, comprising inventory holding time, receivable collection days, and payable settlement delay (Hermanto & Chohan, 2023; Anggarehi & Kelen, 2022), where the shorter the CCC, the more efficient the working-capital management and the better the liquidity and profitability of the company (Pulungan, 2025). Failure to manage the operating cycle can raise a company's risk profile, to which the market responds negatively (Safitri, 2023). Zeidan and Shapir (2017) showed that reducing CCC can increase profitability, cash flow, and firm value, while Chen et al. (2023) found that the effect of CCC on stock returns is stronger in emerging markets; however, Bammeri and Dehani (2014), studying the Tehran Stock Exchange, found no significant relationship, indicating that the effect of working-capital efficiency is highly dependent on industry context and macroeconomic conditions.

On the other hand, Free Cash Flow is a measure of the cash available to a company after fulfilling all investment needs (Mursidah et al., 2023), which, according to Jensen's (1986) Free Cash Flow Theory, can serve as a signal of financial health while also potentially triggering agency problems. Osebe (2018) found that companies with growth opportunities and large FCF tend to have higher valuations, and Dukalang et al. (2021), studying the mining sector on the Johannesburg Stock Exchange, confirmed the relevance of FCF to stock prices despite its potential to create

manager–shareholder conflicts of interest. The exchange rate as a macroeconomic variable has also been shown to play an important role: Bartram and Bodnar (2012), studying non-financial companies in 37 countries, found a return premium of 1.2–3.3% per unit of currency exposure operating primarily through the cash-flow channel rather than the discount rate.

To address the scant attention given to foreign exchange rate moderation on working capital performance and liquidity metrics in currency-sensitive markets like coal extraction, this research investigates how CCC and FCF collectively govern equity returns among IDX-traded coal issuers from 2022 to 2024. Existing literature predominantly isolates cash flow metrics from working capital cycles without assessing their joint impact, creating an empirical gap that this study bridges alongside the novel macro-context of post-pandemic recovery and volatile international energy prices. Consequently, we evaluate both the direct equity effects of CCC and FCF and the conditional influence exerted by the IDR/USD exchange rate across this specific observation window.

LITERATURE REVIEW

This literature overview is structured around three core themes: the underlying theoretical framework governing variable interactions, an analysis of prior empirical works, and the formulation of research hypotheses.

Theoretical Foundation

Efficient Market Hypothesis (EMH). According to the theoretical framework developed by Fama (1970), investors are unable to generate persistent abnormal yields from evaluating public domain information because security valuations completely embody all existing data. This market efficiency is classified into a threefold taxonomy: (1) weak form, which reflects historical market and price figures; (2) semi-strong form, which captures all public disclosures including financial accounting statements; and (3) strong form, which extends to non-public insider information.

Signaling Theory. Based on Spence's (1978) conceptualization, management utilizes observable signals to transmit proprietary insights to the market, thereby bridging the information gap between corporate leadership and potential investors (Zainuddin et al., 2022). In the context of this study, a short CCC signals operational efficiency and good management quality, positive FCF signals financial health and flexibility to provide returns to shareholders, and the exchange rate acts to strengthen or weaken both signals, depreciation of the Rupiah tends to strengthen the positive signal of an efficient CCC and a strong FCF through an increase in the converted value of export revenue, while appreciation of the Rupiah tends to weaken it.

Stock Return, CCC, FCF, and Exchange Rate. Equity yields represent the total earnings realized by investors, comprising both capital appreciation and dividend payouts (Jogiyanto, 2017; Purba & Juliartini, 2025), typically quantified by evaluating price changes between consecutive trading periods. Concurrently, the Cash Conversion Cycle (CCC) serves as an operational metric tracking the duration (expressed in days) required for an enterprise to liquidate its investments in inventory and trade receivables into cash inflows (Richards & Laughlin, 1980), while Free Cash Flow (FCF) is the cash remaining after all investment needs have been met, reflecting a company's financial flexibility (Brigham & Houston, 2019; Mahanavami, 2023). The exchange rate represents the comparative price ratio between the Indonesian Rupiah and the US Dollar (Mankiw, 2019), which plays an important role for export-oriented companies such as coal-mining issuers (Bartram & Bodnar, 2012).

Previous Study and Hypothesis Development

Effect of Cash Conversion Cycle on Stock Return. A short CCC reflects management's ability to accelerate cash inflows, thereby reducing the risk of inventory obsolescence and uncollectible receivables amid market uncertainty (Sari, 2021). Theoretically, a short CCC provides a positive signal of operational efficiency (Aryani & Rahardjo, 2024), reduces the need for external financing and its associated cost of capital, and ultimately increases profitability and stock returns (Hasibuan et al., 2025). Empirical evidence from Chen et al. (2022) and Zeidan and Shapir (2017) shows that reducing CCC is consistently associated with increased returns and firm value, leading to the first hypothesis:

H1: Cash Conversion Cycle (CCC) has a negative effect on stock returns in coal mining companies listed on the Indonesia Stock Exchange during the 2022–2024 period.

Effect of Free Cash Flow on Stock Return. High FCF sends a strong signal about a company's prospects because it gives management the flexibility to pay dividends, conduct share buybacks, or repay debt (Suwaldiman, 2018). In an efficient market with good governance, strong FCF is viewed by investors as evidence of superior operational performance that increases demand for, and the price of, shares (E. Susanti & Hindasah, 2025). Findings from Oyieko (2018), Chimuchiti (2022), and Sabrina and Machdar (2025) confirm a positive relationship between FCF and stock price/return, leading to the second hypothesis:

H2: Free Cash Flow (FCF) has a positive effect on stock returns in coal mining companies listed on the Indonesia Stock Exchange during the 2022–2024 period.

Moderating Role of the Exchange Rate on the Effect of CCC on Stock Return. Through the cash-flow effect mechanism, depreciation of the Rupiah gives a competitive advantage to companies with a short CCC because they can quickly convert export receivables into cash and realize exchange-rate gains before the direction of volatility reverses (Restuti & Widyaningrum, 2015; Hariri, 2025), while companies with a long CCC lose this momentum. Bartram and Bodnar (2012) show that the impact of exchange-rate risk on stock returns operates largely through this cash-flow channel, and Masken (2024) found that depreciation of the Rupiah tends to increase stock returns in the coal subsector through the conversion of export revenue. Based on this discussion, the third hypothesis is formulated:

H3: The exchange rate moderates the effect of the Cash Conversion Cycle (CCC) on stock returns in coal mining companies listed on the Indonesia Stock Exchange during the 2022–2024 period.

Moderating Role of the Exchange Rate on the Effect of FCF on Stock Return. Depreciation of the Rupiah against the USD increases the converted value of export revenue in Rupiah terms, potentially increasing operating cash flow and FCF (Sandi et al., 2024), which in turn strengthens investor confidence and stock returns; conversely, appreciation of the Rupiah decreases this converted value and may suppress investor confidence (Cahyani et al., 2025). Thus, the exchange rate has the potential to strengthen or weaken the effect of FCF on stock returns, leading to the fourth hypothesis:

H4: The exchange rate moderates the effect of Free Cash Flow (FCF) on stock returns in coal mining companies listed on the Indonesia Stock Exchange during the 2022–2024 period.

RESEARCH METHODS – Heading 1 (Times New Roman 10, Bold, Align Left, UPERCASE)

Adopting a quantitative causal-comparative framework, this investigation evaluates empirical cause-and-effect dynamics linking independent factors (CCC and FCF) to equity yields, alongside the moderating role of foreign exchange rates (Creswell & Creswell, 2018; Hair et al., 2019). The empirical dataset utilizes panel data structures merging 22 corporate entities across 2022–2024, an approach that controls for firm-level unobserved heterogeneity while enhancing estimation efficiency (Baltagi, 2021; Gujarati & Porter, 2021). To analyze both direct impacts and the conditioning influence of currency fluctuations, a Moderated Regression Analysis (MRA) specification is executed via EViews 10 software (Hayes, 2022; Wooldridge, 2020).

The outcome metric is defined as stock return, reflecting capital growth resulting from share price shifts (Jogiyanto, 2017). Predictors comprise the Cash Conversion Cycle (CCC), tracking operational days needed to turn inventory and receivables into cash flows (Richards & Laughlin, 1980), and Free Cash Flow (FCF), representing surplus cash following capital investment allocations (Brigham & Houston, 2019). The moderating factor is captured by the IDR/USD middle exchange rate (Mankiw, 2019), with comprehensive operationalizations detailed in Table 1.

Table 1. Operational Definitions and Variable Measurement

Variable	Operational Definition	Measurement
Stock Return (Y)	Rate of return investors obtain from the change in current-period stock price compared with the previous period (Jogiyanto, 2017)	$R_t = (P_t - P_{t-1}) / P_{t-1}$
CCC (X1)	Time period (days) required to convert inventory and receivables into cash (Richards & Laughlin, 1980)	$CCC = ICP + RCP - PDP$

Variable	Operational Definition	Measurement
FCF (X2)	Cash remaining after deducting the capital expenditure required to maintain/develop assets (Brigham & Houston, 2019)	FCF = NOPAT + Depreciation – Δ Working Capital – Capex
Exchange Rate (Z)	Price of the Rupiah expressed in US Dollars (Mankiw, 2019)	Ln of year-end JISDOR middle rate
CCC $\times$ Exchange Rate	Interaction of CCC with the exchange rate, to test moderation	CCC $\times$ Exchange Rate
FCF $\times$ Exchange Rate	Interaction of FCF with the exchange rate, to test moderation	FCF $\times$ Exchange Rate

Source: researchers' summary, 2026

Table 2. Sample Selection Procedure

No.	Criteria	Companies Excluded	Companies Remaining
,	Coal Production subsector companies listed on the IDX, 2022–2024 (initial population)	,	27
1	Not continuously listed in the Coal Production subsector throughout 2022–2024	2	25
2	Did not publish complete, audited annual financial reports for 2022–2024	0	25
3	Incomplete data on the research variables (CCC, FCF, stock return, exchange rate)	1	24
4	Did not report positive earnings for at least two of the three years	2	22
	Final sample		22
	Total observations (22 companies $\times$ 3 years)		66

The research population encompasses 27 coal-mining subsector firms listed on the Indonesia Stock Exchange throughout 2022–2024 (IDX, 2024), with sample selection executed via purposive sampling techniques (Sekaran & Bougie, 2020) using four criteria, as summarized in Table 2. Based on this selection process, 22 companies met all criteria over a three-year period, resulting in a total of 66 firm-year observations (balanced panel), which meets the minimum requirement of 30 observations for panel data regression (Baltagi, 2021).

The data used are archival secondary information encompassing audited annual financial statements alongside year-end stock settlement prices, and IDR/USD middle exchange-rate data published by Bank Indonesia, collected through the documentation method (Creswell & Creswell, 2018) and processed using Microsoft Excel and EViews 10. This study was conducted upholding objectivity, methodological transparency, the use of verifiable public data, and integrity in reporting results as they are (Wooldridge, 2020; Hair et al., 2019); no specific ethical-clearance procedure was required, as all data originate from official publications and do not directly involve human subjects.

Data analysis begins with descriptive statistics for all variables. The first and second hypotheses are tested using panel data regression:

$$\text{Model 1: Return}_{it} = \alpha + \beta_1 \text{CCC}_{it} + \beta_2 \text{FCF}_{it} + \beta_3 \Delta \text{ExchangeRate}_t + \varepsilon_{it}$$

$$\text{Model 2: Return}_{it} = \alpha + \beta_1 \text{CCC}_{it} + \beta_2 \text{FCF}_{it} + \beta_3 \Delta \text{ExchangeRate}_t + \beta_4 (\text{CCC}_{it} \times \Delta \text{ExchangeRate}_t) + \beta_5 (\text{FCF}_{it} \times \Delta \text{ExchangeRate}_t) + \varepsilon_{it}$$

where i denotes the company and t denotes the year (2022–2024). Model 1 tests the direct effect of CCC and FCF on stock returns (H1 and H2), while Model 2 adds interaction variables to test the moderating role of the exchange rate (H3 and H4) through Moderated Regression Analysis (MRA).

Model selection among the pooled baseline (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) was determined via Chow specification (CEM vs. FEM) and Hausman testing (FEM vs. REM) (Baltagi, 2021;

Gujarati & Porter, 2021). Prior to evaluating parameter estimates, diagnostic tests, including residual normality (Jarque-Bera), multicollinearity assessments (Variance Inflation Factor and correlation metrics), and heteroscedasticity evaluation (Glejser Test), were performed to verify BLUE properties (Hair et al., 2019). Hypotheses were empirically evaluated using goodness-of-fit metrics (R^2), overall model significance (F -test), and partial coefficient significance (t -test) at a 5% alpha threshold (Hayes, 2022).

RESULT AND ANALYSIS

Summary statistics were evaluated across 22 IDX-listed coal extraction firms over 2022–2024, yielding a balanced dataset of 66 firm-year observations as detailed in Table 3.

Table 3. Descriptive Statistics

Statistic	CCC/X1 (Days)	FCF/X2 (Thousand USD)	Exchange Rate/Z (IDR/USD)	Return/Y
Mean	-3,474.07	49,493,500.00	15,326.75	0.3360
Median	2.51	9,264,847.00	15,254.41	0.0080
Maximum	122.23	88,065,628,675.00	15,849.91	6.7700
Minimum	-218,909.34	-100,089.28	14,875.94	-0.6000
Std. Dev.	27,142.71	1.82982E+11	400.89	1.1200
Observations	66	66	66	66

Source: EViews 10 output, processed data, 2026

Stock return shows a mean of 0.336 (33.6%) and a median of 0.008 (0.8%); this gap indicates a small proportion of observations with very high returns that raise the average, while the median close to zero reflects a near-breakeven condition for half of the sample, consistent with the normalization of coal prices after 2022. Ranging between a maximum observation of 6.77 (677%) and a minimum floor of -0.60 (-60%), with a standard deviation of 1.12, confirm the high volatility inherent in commodity-sector stocks.

The CCC variable shows a highly asymmetric distribution due to extreme outliers, so the median of 2.51 days, indicating that most companies are able to convert working capital into cash within 2–3 days, is more representative than the mean. The maximum value of 122.23 days indicates a wide range of efficiency across companies. The FCF variable has a mean of USD 49,493,500.00 thousand and a median of USD 9,264,847.00 thousand that differ substantially, reflecting high heterogeneity in financial capacity across issuers, ranging from moderate to very large FCF, with some observations showing negative FCF that indicates a phase of intensive expansion or asset renewal. The exchange rate is relatively stable, with a mean of IDR 15,326.75/USD and a median of IDR 15,254.41/USD that are close together, ranging between IDR 14,875.94/USD and IDR 15,849.91/USD, reflecting moderate depreciation pressure that was controlled through Bank Indonesia intervention.

Table 4. Chow Test and Hausman Test Results

Test	Statistic	d.f.	Prob.	Result
Chow Test (Cross-section F)	2.180	(21,41)	0.016	FEM
Hausman Test (Chi-Sq.)	15.004	5	0.010	FEM

Source: EViews 10 output, processed data, 2026

Statistical evaluation via the Chow test produced an F-statistic of 2.180 ($p = 0.016$), leading to the rejection of H_0 and favoring FEM over the Common Effect Model. Further model specification using the Hausman test resulted in a Chi-Square value of 15.004 ($p = 0.010$), confirming the rejection of H_0 and preferring FEM to the Random Effect Model. Hence, FEM was employed as the core econometric specification (Table 3).

Diagnostic checks indicate full compliance with Best Linear Unbiased Estimator (BLUE) criteria. Specifically, residual normality was affirmed via the Jarque-Bera statistic (4.65, $p = 0.097$); multicollinearity evaluation showed

the strongest correlation between CCC and FCF at -0.870, safely below the critical 0.90 limit; and heteroscedasticity testing using the Glejser method demonstrated non-significant values across all independent variables $p > 0.05$ (0.615, 0.052, 0.508), indicating no heteroscedasticity. As a precaution, the FEM estimation still applies White cross-section standard errors that are robust to potential heteroscedasticity.

Table 5. Fixed Effect Model Estimation Results (Model 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Decision
CCC (X1)	-0.047450	0.004398	-10.78964	0.0000	H1 Accepted
FCF (X2)	3.01E-07	1.02E-07	2.952984	0.0052	H2 Accepted
Exchange Rate (Z)	0.102192	0.026684	3.829701	0.0004	Sig. (+)
C	-0.051468	0.323370	-0.159162	0.8743	–

R^2 (Weighted) = 0.9980; Adj. R^2 = 0.9968; R^2 (Unweighted) = 0.9119; F-stat = 845.5506 (Prob. = 0.0000); DW-stat = 2.2449

Source: EViews 10 output, processed data, 2026

For Model 1, goodness-of-fit metrics indicate high explanatory power, evidenced by a weighted R^2 of 0.9980 (adjusted R^2 = 0.9968) and an unweighted R^2 of 0.9119, alongside an F-test value of 845.5506 (p = 0.0000) confirming overall statistical validity; the Durbin-Watson value of 2.2449 rules out autocorrelation concerns. Individual parameter estimates confirm H1, as CCC demonstrates a strong negative influence on stock returns (t = -10.790, p = 0.0000), where each single-day increase in CCC depresses equity yields by about 4.75 percentage points. FCF positively influences stock returns (t = 2.953, p = 0.0052), accepting H2. The exchange rate variable also yields a significant positive coefficient (β = 0.1022, p = 0.0004), reflecting how local currency depreciation enhances stock returns across export-oriented coal issuers.

Testing of the third and fourth hypotheses regarding the moderating role of the exchange rate was carried out through (MRA), with the results presented in Table 5.

Table 6. Moderated Regression Analysis Results (Model 2)

Variable	Coefficient	Std. Error	t-Stat	Prob.	Decision
CCC (X1)	0.472677	0.171308	2.759220	0.0088	Sig. (+)
FCF (X2)	2.60E-05	8.81E-06	2.951474	0.0053	Sig. (+)
Exchange Rate (Z)	1.086094	0.310865	3.493775	0.0012	Sig. (+)
CCC × Exchange Rate	-0.048988	0.017629	-2.778804	0.0083	H3 Accepted
FCF × Exchange Rate	-2.65E-06	8.96E-07	-2.953240	0.0053	H4 Accepted
C	-10.44663	3.059897	-3.414047	0.0015	–

Source: EViews 10 output, processed data, 2026

Model 2 (MRA) specifications exhibit robust goodness-of-fit, reflected by weighted and unweighted R^2 values of 0.9949 and 0.9083, respectively, alongside an F-statistic of 290.5423 (p = 0.0000). Hypothesis 3 is accepted because the CCC x Exchange Rate interaction term yields a strong negative effect (β = -0.048988, p = 0.0083), indicating that currency exchange rates moderate the relationship between CCC and stock returns in a weakening direction. H4 is likewise supported, with the FCF \times Exchange Rate interaction displaying a negative significant coefficient (β = -2.65×10^{-6} , p = 0.0053) that weakens the direct FCF effect. Consequently, all four hypothesized relationships are supported, as outlined in Table 6.

Table 7. Summary of Hypothesis Testing Results

H	Hypothesis	Prob.	Result
H1	CCC has a significant negative effect on stock returns	0.0000	Accepted
H2	FCF has a significant positive effect on stock returns	0.0052	Accepted
H3	Exchange rate moderates (weakens) the effect of CCC on stock returns	0.0083	Accepted
H4	Exchange rate moderates (weakens) the effect of FCF on stock returns	0.0053	Accepted

Source: EViews 10 output, processed data, 2026

Effect of CCC on Stock Return. This result confirms H1 and is consistent with Signaling Theory (Spence, 1978): a shorter CCC reflects more efficient working-capital management and can be interpreted by investors as a positive operational signal, which is reflected in higher stock returns. Because liquidity and profitability were not modeled directly in this study, the interpretation is limited to this direct, statistically observed relationship between CCC efficiency and stock return, rather than an untested mediating chain. Amid the normalization of coal prices from USD 280/ton (2022) to USD 121/ton (2024) (ESDM, 2024; APBI, 2024), CCC efficiency becomes a crucial differentiator of stock performance, consistent with the findings of Chen et al. (2022) and Zeidan and Shapir (2017), and reinforcing the working-capital risk perspective of Rorlen et al. (2023), who link inefficient working-capital management to a higher risk profile that the market responds to negatively.

This result validates H2 and aligns with the Free Cash Flow Theory articulated by Jensen (1986), which posits that substantial FCF signals corporate financial strength and the operational ability to generate value for equity holders via dividend distributions, share repurchases, or expansionary capital expenditures. With an average FCF of USD 168,856.70 thousand, the ability to maintain positive FCF amid commodity-price pressure becomes a fundamental signal that investors respond to positively, in line with Oyieko (2018) and Saskiah and Asmedi (2025).

The negative and significant interaction coefficient indicates that Rupiah depreciation strengthens, rather than weakens, the negative relationship between CCC and stock return. A plausible explanation is that when the Rupiah weakens, USD-denominated operating costs, such as heavy equipment, spare parts, and fuel, rise in Rupiah terms, intensifying the working-capital burden particularly for companies with an already long and inefficient CCC, which investors may value increasingly negatively. Companies with a shorter CCC, by contrast, are comparatively better positioned to absorb this exposure due to faster working-capital turnover. This interpretation is offered as a possible mechanism consistent with the working-capital risk perspective of Rorlen et al. (2023) and the cash-flow exposure framework of Bartram and Bodnar (2012), rather than as a directly tested causal pathway in this study.

Although coal-exporting companies are nominally advantaged by Rupiah depreciation, the negative interaction coefficient suggests the positive effect of FCF on stock return is dampened as the exchange rate rises. One possible explanation is that pronounced Rupiah depreciation leads investors to reprice the risk of Rupiah-denominated assets, demanding a higher risk premium even as a company's FCF fundamentally improves; sharp depreciation episodes are also often accompanied by balance-of-payments pressure or monetary tightening that can weigh on broader market sentiment, in line with Fitrianur et al. (2025). As with the CCC finding above, this remains a plausible interpretation of the estimated coefficients rather than a directly tested behavioral mechanism, and is offered as a candidate explanation for future research to examine more directly (e.g., through investor-sentiment or risk-premium proxies).

CONCLUSION

ased on panel data regression estimates combining the Fixed Effect Model and Moderated Regression Analysis across 22 IDX-listed coal issuers over the 2022–2024 observation window, this study synthesizes four core empirical outcomes alongside theoretical and practical insights. First, working capital conversion speed directly drives shareholder returns, as evidenced by a strongly significant inverse relationship between the Cash Conversion Cycle and stock returns ($\beta = -0.047450$, $p < 0.001$). Second, robust Free Cash Flow exerts a statistically significant positive effect on stock returns ($\beta = 3.01 \times 10^{-7}$, $p = 0.0052$), confirming that surplus cash liquidity provides an optimistic fundamental signal to capital markets. Third, foreign exchange dynamics act as a negative quasi-moderator; a depreciating Rupiah intensifies working capital penalties ($\beta_{CCC \times FX} = -0.048988$, $p = 0.0083$) due to escalating

foreign-currency operating expenses among firms with protracted cash conversion cycles. Fourth, currency fluctuations similarly weaken the positive impact of cash flow on equity yields ($\beta_{FCF \times FX} = -2.65 \times 10^{-6}$, $p = 0.0053$), as heightened exchange rate volatility prompts investors to demand elevated risk premiums. Theoretically, these results validate Signaling Theory and the Efficient Market Hypothesis by demonstrating how equity markets interpret operational agility and liquidity against macroeconomic headwinds. Practically, investors should evaluate CCC and FCF alongside foreign exchange trends, while corporate management is advised to accelerate receivables collection, streamline inventory turnover, and implement structured hedging mechanisms to protect shareholder value from exchange rate risk exposure

This study has limitations in its single-sector scope and three-year period; future research is therefore recommended to expand the sample to other export sectors on the IDX, add relevant variables such as the reference coal price (HBA), inflation, or interest rates, extend the observation period to capture a more complete commodity cycle, and consider alternative analytical methods to address potential endogeneity between variables.

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