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Macroeconomic and Market-Based Determinants of Bank Central Asia's Stock Returns: An ARDL Bounds Testing Approach, 2016–2025

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Abstract

Bank Central Asia (BBCA) is one of the largest and most actively traded stocks on the Indonesia Stock Exchange, yet its monthly returns have been volatile during the pandemic, global monetary tightening and rupiah pressure. This study examines how inflation, the rupiah exchange rate, the 10-year government bond yield, trading volume, market capitalization and the COVID-19 period affect BBCA's stock returns. Arbitrage Pricing Theory is used to justify the selection of variables, and the present value model is used to derive their expected directions. Monthly data from January 2016 to December 2025 are analyzed with an Autoregressive Distributed Lag (ARDL) bounds testing approach. The bounds test (F = 14.71, k = 6) confirms a long-run relationship. In the long run, inflation (positive, contrary to the hypothesis), market capitalization (positive), exchange-rate depreciation (negative) and the pandemic period (negative) are significant, whereas the bond yield and trading volume are not. In the short run, depreciation and trading volume lower returns, and inflation has lag-dependent effects. The market capitalization–return link is partly mechanical because both are derived from the same price. BBCA's sensitivity to systematic factors therefore differs across horizons.

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INTRODUCTION

Global financial integration has exposed emerging-market equities to external shocks, including the COVID-19 pandemic, geopolitical tension and the monetary tightening of advanced economies. Indonesia's stock market has been no exception. After the first COVID-19 cases were officially announced on 2 March 2020, stock performance on the Indonesia Stock Exchange (IDX) reacted sharply (Nugraha et al., 2022), and the daily growth in confirmed cases was negatively associated with the returns of 272 listed firms (Hanggraeni, 2021). Later evidence shows that government interventions, such as lockdowns in Jakarta, also moved sector returns (Sinaga et al., 2022).

PT Bank Central Asia Tbk (BBCA) is a private bank and one of the largest and most actively traded stocks on the IDX, and it is widely regarded as a bellwether of the financial sector. Between 2016 and 2025 its monthly return ranged from about −15.78% to +10.56%, with sharp declines of about −13.85% in 2020, the pandemic year, and −15.78% in 2022, when global monetary tightening raised risk aversion toward emerging markets. Such swings suggest that BBCA's returns are not driven by firm-specific performance alone but also by systematic factors that affect the whole market.

Arbitrage Pricing Theory (APT) provides a natural framework for this question. APT holds that the expected return on a security depends on its sensitivity to a set of systematic risk factors that cannot be eliminated by diversification (Ross, 1976). Because APT does not prescribe which factors to use, this study adopts a two-stage logic. First, APT justifies why each variable is treated as a source of systematic risk (Roll & Ross, 1980; Chen et al., 1986). Second, the present value model determines

the expected direction of each effect through two channels, expected cash flows and the discount rate (Campbell & Shiller, 1988).

Indonesian evidence remains mixed and is mostly based on indices, groups of banks or short samples. Using monthly ARDL models for 2009–2025, Suryana et al. (2026) find that inflation raises LQ45 returns in the long run while the exchange rate matters only in the short run, and Salsabila et al. (2026) find no long-run relationship for the composite index over 2016–2025 but a negative short-run effect of rupiah depreciation. For banking stocks, Jofanka et al. (2023) apply an APT model to 2020–2022 and find a negative exchange-rate effect but no significant inflation or interest-rate effect, whereas Amelia et al. (2026) report an insignificant inflation effect and a negative interest-rate effect over 2020–2024. To our knowledge, few studies examine a single bellwether stock over a decade, combine macroeconomic and market-based variables, and separate short-run from long-run responses in one framework. The evidence is also regime-dependent: Prananta and Alexiou (2024) find no cointegration among the exchange rate, the 10-year bond yield and the stock market over 2012–2021 using daily data, but cointegration appears during the COVID-19 period.

This study therefore analyzes the effects of inflation, the rupiah exchange rate, the 10-year government bond yield, trading volume, market capitalization and the COVID-19 period on BBCA's monthly stock returns from January 2016 to December 2025, using an ARDL bounds testing approach. The contribution is threefold: (i) an APT–present value framework that separates variable selection from sign determination; (ii) a joint treatment of macroeconomic and market-based factors for one bellwether stock; and (iii) an explicit separation of short-run and long-run responses, including a transparent discussion of the mechanical link between market capitalization and returns.

LITERATURE REVIEW

Theoretical Foundation

Arbitrage Pricing Theory. APT states that a security's expected return is a linear function of its sensitivities (betas) to systematic risk factors, while firm-specific risk is diversifiable and therefore unpriced (Ross, 1976). The theory does not name the factors, so their selection must rest on theory and empirical evidence (Roll & Ross, 1980). Chen et al. (1986) and Burmeister et al. (1994) show that suitable factors are pervasive across firms, have a clear economic rationale and can be measured objectively. Inflation and the term structure of interest rates are among the factors identified by Chen et al. (1986).

Present value model. In the present value model, the price of a stock equals the discounted value of its expected future cash flows (Williams, 1938; Brealey et al., 2020). Returns change when a variable alters expected cash flows or the required rate of return (Campbell & Shiller, 1988). Chen et al. (1986) themselves express stock prices as expected discounted dividends, so combining APT with the present value model follows the logic of the original APT factor study. In this study, APT answers why a variable is selected, and the present value model answers in which direction it should move returns.

Liquidity theory and the size effect. Liquidity theory argues that investors demand compensation for transaction costs and the difficulty of selling an illiquid asset, so less liquid stocks carry a higher required return (Amihud & Mendelson, 1986). Liquidity risk is also priced as a systematic factor (Pástor & Stambaugh, 2003), and unexpected illiquidity is negatively related to contemporaneous returns (Amihud, 2002). The size effect, in turn, refers to the finding that small firms earn higher average returns than large firms (Banz, 1981); size is treated as a common risk factor in multifactor models (Fama & French, 1993), and Berk (1995) argues that size mainly reflects differences in discount rates.

Prior Studies and Hypothesis Development

Table 1 summarizes selected Indonesian and emerging-market studies. The evidence is mixed across variables, samples and horizons, which motivates testing the proposed hypotheses for a single bellwether stock over a longer window.

Table 1. Selected Prior Studies

Study	Context and method	Main findings

Study	Context and method	Main findings
Utomo et al. (2019)	LQ45 price index, 2015–2017; macroeconomic variables	Long run: exchange rate, BI rate and inflation negative; short run: exchange rate and inflation positive.
Permaysinta & Sawitri (2021)	Indonesian listed stocks; partial tests	Inflation and interest rate not significant; exchange rate significant.
Nurhayati et al. (2021)	Indonesian listed stocks; determinants of stock returns including trading volume activity	Greater trading volume activity is associated with higher returns.
Suriani et al. (2022)	Composite and Jakarta Islamic indices, monthly 2011–2020; error correction model	Policy rate negative; exchange rate positive in the long run and negative in the short run; inflation not significant in the long run.
Jofanka et al. (2023)	Banking stocks, 2020–2022; APT model	Inflation and interest rate not significant; exchange rate negative.
Omodero et al. (2023)	Nigeria; regression on stock market returns	Sovereign bond not significant; interest rate strongly negative.
Prananta & Alexiou (2024)	Indonesian stock market, daily 2012–2021; NARDL	No cointegration among exchange rate, 10-year yield and stock market over the full sample; cointegration during COVID-19; asymmetric effects.
Riantani et al. (2024)	17 palm oil plantation issuers, 2020–2022; APT model	Inflation negative; exchange rate, money supply and interest rate not significant.
Saifudin et al. (2025)	LQ45 stocks, 2022–2024	Exchange rate negative and trading volume positive.
Suryana et al. (2026)	LQ45 returns, monthly 2009–2025; ARDL	Long run: inflation and IHSG returns positive, policy rate and exchange rate insignificant; short run: exchange rate negative.
Salsabila et al. (2026)	IHSG, monthly 2016–2025; ARDL/UECM	No long-run relationship; short run: rupiah depreciation lowers IHSG, lagged inflation positive.
Amelia et al. (2026)	35 banks, 2020–2024; panel regression	Inflation not significant; interest rate negative.
Ajmilia et al. (2026)	22 banks, 2019–2023; moderated regression	Trading volume and market capitalization negative but not significant.

Source: Authors' compilation from the cited studies.

Inflation. Higher inflation raises operating costs and erodes purchasing power, lowering real cash flows (Fama, 1981), and it raises the nominal required return (Fisher, 1930; Mishkin, 2019). Investors who discount real cash flows at nominal rates may also undervalue equities when inflation is high (Campbell & Vuolteenaho, 2004). Evidence is mixed: Permaysinta and Sawitri (2021) and Amelia et al. (2026) find no significant effect, Utomo et al. (2019) find a negative long-run effect on the LQ45 index, and Suryana et al. (2026) find a positive long-run effect on LQ45 returns. APT-based studies of other sectors report negative effects (Ichsani et al., 2019; Riantani et al., 2024), whereas Suriani et al. (2022) find no long-run inflation effect on the composite index. Following the two channels of the present value model, **H1**: inflation has a negative effect on BBCA's stock returns.

Exchange rate. Exchange-rate risk is priced in equity markets (Dumas & Solnik, 1995). Depreciation of the rupiah raises imported input costs and the burden of foreign-currency liabilities (Jorion, 1990) and, for banks, weakens debtors' balance sheets and raises credit risk (Mishkin, 2019). Negative effects are reported by Jofanka et al. (2023), Salsabila et al. (2026), Suryana et al. (2026) in the short run, and Saifudin et al. (2025); Suriani et al. (2022) also find a negative short-run effect, although their long-run effect is positive. **H2**: depreciation of the rupiah against the US dollar has a negative effect on BBCA's stock returns.

Government bond yield. The 10-year government bond yield serves as a proxy for the long-term risk-free rate that enters the discount rate (Brealey et al., 2020). Higher yields lower present values and make fixed-income assets more attractive, and for financial institutions higher rates reduce the market value of fixed-income assets (Flannery & James, 1984). Stock reactions to monetary policy surprises operate largely through expected equity risk premia (Bernanke & Kuttner, 2005). Omodero et al. (2023) find that sovereign bonds are insignificant but interest rates are strongly negative for Nigerian stock returns, and Amelia et al. (2026) find a negative interest-rate effect for banks. Prananta and Alexiou (2024) find no cointegration between the 10-year yield and the Indonesian stock market

over 2012–2021, but a long-run relationship during the COVID-19 period. **H3**: the 10-year government bond yield has a negative effect on BBCA's stock returns.

Trading volume. Trading volume reflects liquidity and the arrival of new information. Under liquidity theory, higher volume signals better liquidity, a smaller liquidity premium and a lower discount rate (Amihud & Mendelson, 1986; Amihud, 2002), while volume is positively related to price changes in equity markets (Karpoff, 1987). Volume also has a common factor structure across stocks (Lo & Wang, 2000). Nurhayati et al. (2021) and Saifudin et al. (2025) find positive effects of trading volume on stock returns, whereas Ajmilia et al. (2026) report a negative but insignificant effect for banks. Christiana et al. (2016) document a positive contemporaneous return–volume relationship for the Jakarta Composite Index, with causality running from returns to volume. **H4**: trading volume has a positive effect on BBCA's stock returns.

Market capitalization. Because this study observes one firm over time, the size effect is not applied as a cross-sectional relationship. Instead, a rise in market capitalization is interpreted as a revaluation of expected cash flows or a decline in the discount rate as the firm becomes larger and more resilient to shocks. This direction therefore differs from the cross-sectional size effect (Banz, 1981). Direct evidence for banks is not supportive: Ajmilia et al. (2026) find a negative but insignificant effect of market capitalization on bank stock returns. **H5**: market capitalization has a positive effect on BBCA's stock returns.

COVID-19 period. The pandemic was a common shock that cannot be diversified away. Stock markets reacted far more strongly to COVID-19 than to earlier infectious-disease outbreaks (Baker et al., 2020), and confirmed cases and deaths were negatively associated with returns (Al-Awadhi et al., 2020; Hanggraeni, 2021; Mugiarni & Wulandari, 2021). Prananta and Alexiou (2024) further show that long-run linkages among the exchange rate, bond yield and stock market emerge during the COVID-19 period. Through the present value model, the pandemic lowers expected cash flows because of activity restrictions (Ramelli & Wagner, 2020) and raises discount rates through uncertainty. Because the dummy variable serves as a control, it is tested two-tailed without a directional hypothesis.

METHOD

Research Design and Data

This study uses a quantitative, associative-causal design. The research subject is PT Bank Central Asia Tbk (BBCA) listed on the Indonesia Stock Exchange. The data are secondary monthly time series from January 2016 to December 2025 (120 observations), collected by documenting the official publications and market-data platforms listed in Table 2. The dependent variable is the monthly return of BBCA, and the independent variables are inflation, the rupiah exchange rate, the 10-year government bond yield, trading volume, market capitalization and a COVID-19 dummy. All estimations are carried out in EViews.

Variables and Measurement

Table 2 presents the variables, their measurement, sources and expected signs.

Table 2. Variables, Measurement and Expected Signs

Variable	Symbol	Measurement	Source	Expected sign
BBCA stock return	RBBCA	Monthly return, $(P_t - P_{t-1})/P_{t-1}$, in decimal form, using closing prices	Investing.com	Dependent
Inflation	INF	Monthly consumer price index inflation (%)	BPS and Bank Indonesia	−
Exchange rate	LNKURS	Natural logarithm of the monthly average JISDOR (Rp/USD)	Bank Indonesia	−
Government bond yield	YIELD	10-year government bond yield (%)	Investing.com	−
Trading volume	LNVOLBBCA	Natural logarithm of monthly BBCA trading volume	BCA official website	+

Variable	Symbol	Measurement	Source	Expected sign
Market capitalization	LNMCAP	Natural logarithm of closing price × shares outstanding	BCA official website	+
COVID-19 period	DUMMY	1 for March 2020–June 2023, 0 otherwise	Presidential Decrees No. 11/2020 and No. 17/2023; authors' processing	±

Source: Authors' design.

The pandemic window follows the Indonesian government's official determinations. It begins with the public health emergency declared by Presidential Decree No. 11 of 2020 (Presiden Republik Indonesia, 2020), signed on 31 March 2020, and ends with the termination of the pandemic status by Presidential Decree No. 17 of 2023 (Presiden Republik Indonesia, 2023), effective 21 June 2023.

Analytical Procedure

The analysis follows five steps. First, the Augmented Dickey–Fuller (ADF) test with MacKinnon critical values determines each variable's order of integration. Second, the lag structure is selected by the Akaike Information Criterion using automatic selection in EViews with a maximum lag of seven. Third, the bounds testing approach of Pesaran et al. (2001) tests for a long-run level relationship, where an F-statistic above the upper critical bound I(1) rejects the null of no level relationship. Fourth, the ARDL model is estimated and expressed in its error correction form to separate long-run and short-run effects (Kripfganz & Schneider, 2023). Fifth, the hypotheses are tested with t-tests at the 5% level, one-tailed for variables with a directional hypothesis and two-tailed for the dummy. ARDL is appropriate because it accommodates a mixture of I(0) and I(1) variables provided that none is I(2) (Pesaran et al., 2001). The specification is Case 2 (restricted constant and no trend).

Model Specification

The long-run relationship is specified as:

$$RBBCA_t = \theta_0 + \theta_1 INF_t + \theta_2 LNKURS_t + \theta_3 YIELD_t + \theta_4 LNVOLBBCA_t + \theta_5 LNMCAP_t + \theta_6 DUMMY_t + \varepsilon_t \quad (1)$$

and the short-run dynamics are estimated through the error correction model:

$$\Delta RBBCA_t = \alpha_0 + \Sigma\alpha_i \Delta RBBCA_{t-i} + \Sigma\beta_j \Delta INF_{t-j} + \Sigma\gamma_k \Delta LNKURS_{t-k} + \Sigma\delta_l \Delta YIELD_{t-l} + \Sigma\varphi_m \Delta LNVOLBBCA_{t-m} + \Sigma\rho_n \Delta LNMCAP_{t-n} + \Sigma\vartheta_r \Delta DUMMY_{t-r} + \lambda ECT_{t-1} + \varepsilon_t \quad (2)$$

where Δ is the first difference, ECT_{t-1} is the lagged error correction term and λ is the speed of adjustment. Critical t-values are 1.662 (one-tailed) and 1.987 (two-tailed) for the error correction model (df = 88), and 1.664 and 1.990 for the long-run equation (df = 81).

RESULTS AND DISCUSSION

Results

Unit Root Tests

Table 3 reports the ADF tests. RBBCA, INF, LNKURS, YIELD and LNVOLBBCA are stationary at level, whereas LNMCAP is not (ADF = −1.4207, above all critical values) but becomes stationary after first differencing (ADF = −8.4286). The variables are therefore a mixture of I(0) and I(1) with no I(2) variable, which satisfies the requirement for the ARDL bounds approach. YIELD is stationary at the 5% and 10% levels but not at 1%.

Table 3. ADF Unit Root Test Results

Variable	ADF statistic	1%	5%	10%	Conclusion
RBBCA	−8.3514	−4.0383	−3.4486	−3.1495	Stationary, I(0)
INF	−9.2491	−4.0376	−3.4483	−3.1493	Stationary, I(0)
LNKURS	−4.9948	−4.0369	−3.4480	−3.1491	Stationary, I(0)
YIELD	−3.5386	−4.0369	−3.4480	−3.1491	Stationary at 5%, I(0)
LNVOLBBCA	−7.6196	−4.0369	−3.4480	−3.1491	Stationary, I(0)

Variable	ADF statistic	1%	5%	10%	Conclusion
LNMCAP (level)	−1.4207	−4.0369	−3.4480	−3.1491	Non-stationary
ΔLNMCAP (first difference)	−8.4286	−4.0390	−3.4490	−3.1497	Stationary, I(1)

Source: EViews output (authors' processing). The null hypothesis is the presence of a unit root.

Lag Selection and Bounds Test

The AIC selects ARDL(2, 4, 1, 3, 6, 2, 7) for RBBCA, INF, LNKURS, YIELD, LNVOLBBCA, LNMCAP and DUMMY, respectively, estimated on 113 effective observations. Table 4 shows that the bounds-test F-statistic of 14.70647 (k = 6) exceeds the upper bound I(1) at the 1% level under both asymptotic (3.99) and finite-sample (4.485) critical values, so the null of no level relationship is rejected. The error correction coefficient is −1.216490 (standard error 0.107600, t = −11.30572). A negative and significant error correction coefficient that exceeds one in absolute value implies that the adjustment overshoots the long-run equilibrium: more than the entire previous deviation is corrected in the following month, so that the deviation changes sign and oscillates around the equilibrium path. Because the coefficient lies between −2 and 0, these oscillations diminish over time, and the adjustment is conventionally interpreted as convergent rather than explosive.

Table 4. Bounds Test for a Long-Run Level Relationship (F-statistic = 14.70647; k = 6)

Significance level	Asymptotic I(0)	Asymptotic I(1)	Finite sample (n = 80) I(0)	Finite sample (n = 80) I(1)
10%	1.99	2.94	2.088	3.103
5%	2.27	3.28	2.431	3.518
2.5%	2.55	3.61	–	–
1%	2.88	3.99	3.173	4.485

Source: EViews output (authors' processing). H_0: no level relationship; effective observations = 113.

Short-Run Estimates

Table 5 reports the error correction estimates for the significant coefficients and selected lags. Under the testing criteria used, nine of the 24 short-run coefficients are significant at the 5% level; three of them (D(INF(−1)), D(LNVOLBBCA(−1)) and D(LNMCAP(−1))) are significant only under the one-tailed test.

Table 5. Error Correction Model Estimates (Dependent Variable: ΔRBBCA)

Variable	Coefficient	Std. error	t-statistic	Prob.
D(RBBCA(−1))	0.001566	0.003157	0.495931	0.6213
D(INF)	0.001175	0.000404	2.909205	0.0047
D(INF(−1))	−0.000764	0.000455	−1.679579	0.0969
D(INF(−3))	−0.000805	0.000390	−2.065809	0.0420
D(LNKURS)	−0.018406	0.008215	−2.240535	0.0278
D(YIELD)	−0.000186	0.000715	−0.260700	0.7950
D(LNVOLBBCA)	−0.002405	0.000551	−4.365328	0.0000
D(LNVOLBBCA(−1))	−0.001178	0.000616	−1.912066	0.0594
D(LNMCAP)	−1.007814	0.003286	−306.7278	0.0000
D(LNMCAP(−1))	−0.216006	0.108666	−1.987801	0.0502
D(DUMMY(−5))	−0.003907	0.001092	−3.578346	0.0006
CointEq(−1)	−1.216490	0.107600	−11.30572	0.0000

Source: EViews output (authors' processing). R^2 = 0.999673; adjusted R^2 = 0.999583; S.E. of regression = 0.001401; AIC = −10.11029; Durbin–Watson = 2.095663; Case 2: restricted constant and no trend. The p-value of CointEq(−1) is not compatible with the t-bounds distribution, so its significance refers to the t-bounds critical values.

Long-Run Estimates

Table 6 reports the long-run equation. Inflation, the exchange rate, market capitalization and the pandemic dummy are significant, whereas the bond yield and trading volume are not. Because

RBBCA is measured in decimal form, a coefficient of 0.001 corresponds to a change of 0.1 percentage points in monthly return, and the coefficients on the logarithmic regressors are interpreted per 1% change in the corresponding variable.

Table 6. Long-Run Estimates (Dependent Variable: RBBCA) and Hypothesis Decisions

Variable	Coefficient	Std. error	t-statistic	Prob.	Expected sign	Decision
INF	0.001954	0.000935	2.090696	0.0397	−	H1 not supported (positive)
LNKURS	−0.013573	0.006208	−2.186155	0.0317	−	H2 supported
YIELD	−0.000088	0.000333	−0.264748	0.7919	−	H3 not supported
LNVOLBBCA	−0.001173	0.001266	−0.926359	0.3570	+	H4 not supported
LNMCAP	0.002809	0.001209	2.322572	0.0227	+	H5 supported
DUMMY	−0.000932	0.000413	−2.258518	0.0266	±	Significant (negative)
C	0.058035	0.024830	2.337319	0.0219		

Source: EViews output (authors' processing). One-tailed t-critical value 1.664 for directional variables; two-tailed 1.990 for DUMMY.

Diagnostic Tests

Residual diagnostics in this study are limited to the Durbin–Watson statistic of the error correction model, which is 2.0957 (Table 5). This value is close to the benchmark of 2 and gives no indication of first-order residual autocorrelation. However, because the model contains lagged dependent variables, which bias this statistic toward 2, it should be regarded as indicative only. Formal tests for higher-order serial correlation, heteroskedasticity, residual normality, functional form and parameter stability were not conducted; the inferences drawn from the t-statistics should therefore be interpreted with this limitation in mind. In addition, the very high R^2 of the error correction model (0.9997) should not be read as evidence of predictive accuracy, because it is driven largely by the mechanical link between market capitalization and returns discussed below; inference on the coefficients should rely on the significance tests rather than on the goodness of fit.

Discussion

Inflation

Inflation has a positive and significant long-run effect (0.001954; t = 2.09), meaning a one-percentage-point increase is associated with a 0.1954-percentage-point higher return. This is opposite to H1, so the hypothesis is not supported in the long run. In the short run, the current change in inflation is positive (0.001175; t = 2.91), whereas the first and third lags are negative (−0.000764 and −0.000805), so that a one-percentage-point rise in inflation one and three months earlier is associated with return changes lower by 0.0764 and 0.0805 percentage points, respectively. The lag-1 coefficient is significant only under the one-tailed test (p = 0.0969 two-tailed). The pattern suggests an immediate positive response that reverses in later months. A possible explanation is that firms can pass price increases through to nominal revenue over longer horizons, which weakens the negative cash-flow channel (Boudoukh & Richardson, 1993), and that banks may benefit from interest-rate adjustments that follow inflation. These explanations are interpretive rather than tested here. The long-run result agrees with Suryana et al. (2026) and the short-run lagged positive inflation effect with Salsabila et al. (2026), but differs from Amelia et al. (2026) and Permaysinta and Sawitri (2021), who find no significant effect, and from the negative long-run effect reported for the LQ45 index by Utomo et al. (2019). It also contrasts with the negative effects found in APT-based studies of other sectors (Ichsani et al., 2019; Riantani et al., 2024).

Exchange rate

The exchange rate has a negative and significant effect in both horizons: a 1% depreciation of the rupiah is associated with a 0.0136-percentage-point lower return in the long run (−0.013573; t = −2.19) and a 0.0184-percentage-point lower return change in the short run (−0.018406; t = −2.24). H2 is therefore supported. The direction fits the present value model, because depreciation can lower expected cash flows through higher import costs and weaker borrower balance sheets (Jorion, 1990;

Mishkin, 2019) and raise the risk premium through exchange-rate risk (Dumas & Solnik, 1995). The magnitude is economically small, consistent with BBCA's strong funding and capital base, although this mechanism is not tested directly. The results are in line with Jofanka et al. (2023) for banking stocks, Saifudin et al. (2025) for LQ45, and the short-run results of Suryana et al. (2026) and Salsabila et al. (2026); the insignificant long-run effect in Suryana et al. (2026) shows that evidence depends on the sample and the object studied. The short-run sign matches Suriani et al. (2022), but their long-run exchange-rate effect is positive, unlike the negative long-run effect found here.

Government bond yield

The yield is insignificant in the long run (−0.000088; t = −0.26) and in the short run (−0.000186; t = −0.26), although both coefficients are negative as hypothesized. H3 is therefore not supported. The result does not imply that BBCA's price ignores long-term interest rates: yield changes reflect expected inflation and future returns (Campbell & Ammer, 1993) and may already be captured by inflation and the exchange rate in the model, and for banks higher rates also affect funding costs and the value of securities portfolios (Flannery & James, 1984; Mishkin, 2019). The finding resembles Omodero et al. (2023), who find an insignificant sovereign bond effect, and Suryana et al. (2026) for the policy rate, although those studies use different variables and contexts. In contrast, Amelia et al. (2026) find a negative interest-rate effect for banks. The insignificance is also consistent with Prananta and Alexiou (2024), who find no cointegration among the exchange rate, the 10-year yield and the stock market over the full 2012–2021 sample, which suggests that the yield–stock relationship may emerge only in specific regimes.

Trading volume

Trading volume is insignificant in the long run (−0.001173; t = −0.93) and negative in the short run, both in the current month (−0.002405; t = −4.37) and the first lag (−0.001178; t = −1.91, significant under the one-tailed test only). A 1% rise in volume is associated with a 0.0024-percentage-point lower return change in the same month. H4 is therefore not supported. Under liquidity theory, higher volume should lower the liquidity premium and raise prices (Amihud & Mendelson, 1986; Amihud, 2002), but volume measures the number of shares traded rather than the net direction of trades. Months of heavy selling or profit taking can raise volume while returns fall; the model does not distinguish buy and sell pressure, so this remains an interpretation. Because BBCA is already highly liquid, additional volume may add little long-run information. The negative short-run sign differs from Nurhayati et al. (2021) and Saifudin et al. (2025), who find positive effects, but resembles the negative, insignificant sign reported for banks by Ajmilia et al. (2026). Moreover, because returns Granger-cause volume in Indonesian data (Christiana et al., 2016), volume may respond to price movements rather than drive them.

Market capitalization

Market capitalization has a positive and significant long-run effect (0.002809; t = 2.32), consistent with H5: a 1% increase is associated with a 0.0028-percentage-point higher return. In the short run, however, the coefficients are strongly negative (−1.007814, t = −306.7; −0.216006 at lag 1). The size and t-value of the contemporaneous coefficient, together with the near-perfect fit of the error correction model (R^2 = 0.9997), reflect an accounting relationship: market capitalization equals the price times shares outstanding, and returns are computed from the same price. These coefficients should therefore be read as statistical association rather than an economic effect of firm size on returns. Likewise, the long-run positive sign supports the revaluation interpretation of the present value model but does not contradict the cross-sectional size effect (Banz, 1981; Berk, 1995), which concerns differences in average returns between small and large firms. Evidence for banks also does not support a positive effect: Ajmilia et al. (2026) find a negative but insignificant effect of market capitalization on returns. A size measure that is not built from the same price as the dependent variable would give a cleaner test.

COVID-19 period

The pandemic dummy is negative and significant in the long run (−0.000932; t = −2.26): returns were on average 0.0932 percentage points lower during March 2020–June 2023 than outside that period, after controlling for the other variables. In the short run, the significant coefficient is on the fifth lag (−0.003907; t = −3.58), indicating that a change in pandemic status is associated with a

0.3907-percentage-point lower return change five months later. This is consistent with the evidence that COVID-19 depressed Indonesian stock returns (Hanggraeni, 2021; Mugiarni & Wulandari, 2021; Nugraha et al., 2022; Sinaga et al., 2022) and with the global evidence of strong negative reactions (Al-Awadhi et al., 2020; Baker et al., 2020; Ramelli & Wagner, 2020). The coefficient is small relative to the standard deviation of return changes (0.068666), and because the dummy window also overlaps with the 2022–2023 monetary tightening, the effect cannot be attributed to the pandemic alone. The regime dependence also appears in Prananta and Alexiou (2024), who find long-run linkages among the exchange rate, bond yield and stock market during the COVID-19 period but not over the full sample.

Limitations

Several limitations should be kept in mind. First, the market capitalization–return relationship is partly mechanical, as discussed above. Second, returns are stationary, so the long-run equation describes the level of returns conditional on the levels of the regressors and should be interpreted cautiously. Third, the study examines a single stock, and effect sizes are small in economic terms. Fourth, short-run lag structures are chosen by the AIC and include long lags, such as the fifth lag of the dummy, that have no clear theoretical meaning. Fifth, formal residual diagnostic and stability tests were not performed, so the reliability of the reported standard errors rests on the Durbin–Watson statistic alone. Future studies could report the full set of diagnostic tests, add the policy rate, commodity prices or sentiment indices, use a size measure not derived from the same price, and use higher-frequency data.

CONCLUSION

This study analyzed how inflation, the rupiah exchange rate, the 10-year government bond yield, trading volume, market capitalization and the COVID-19 period relate to BBCA's monthly stock returns from 2016 to 2025 using an ARDL bounds testing approach. A long-run relationship exists ($F = 14.71$), and the error correction term of -1.2165 indicates adjustment toward equilibrium that overshoots before converging. In the long run, depreciation of the rupiah lowers returns, market capitalization is positively related to returns, and returns were lower during the pandemic period, whereas the bond yield and trading volume are not significant. Inflation is positively related to returns in the long run, which contradicts the expected negative sign, and in the short run its effect changes sign across lags. Trading volume is negatively related to return changes in the short run, opposite to the expected direction. The short-run market capitalization result is dominated by an accounting link with returns and does not represent an economic effect. Overall, the results show that BBCA's sensitivity to systematic macroeconomic and market-based factors differs between horizons, and that the hypothesized directions are supported for the exchange rate and, in the long run, market capitalization, but not for inflation, the bond yield or trading volume. Taken together, these findings carry several managerial implications, which are inferences from the estimated associations rather than tested mechanisms.

For investors and portfolio managers, exchange-rate movements are the most consistent macroeconomic signal for BBCA returns, since rupiah depreciation is associated with lower returns in both the short and the long run. Monitoring the rupiah and considering position sizing or hedging during periods of rupiah pressure is therefore a more reliable risk-management practice than relying on the 10-year bond yield, which shows no significant relationship with returns. Because inflation has lag-dependent effects, and because trading volume may respond to price movements rather than drive them, neither variable should be used as a stand-alone signal for short-term trading decisions.

For the management and risk committee of BCA, the sensitivity of returns to exchange-rate depreciation suggests that stress testing and investor communication should incorporate rupiah depreciation scenarios, particularly their implications for the credit quality of foreign-currency borrowers and for funding costs, even though the estimated magnitude is small and is consistent with the bank's strong capital and funding base. For regulators and policymakers, namely Bank Indonesia and the Financial Services Authority (OJK), the results indicate that exchange-rate stability is relevant to the valuation of a systemically important bank, which supports measures that anchor rupiah stability and clear policy communication during episodes of global monetary tightening. The lower returns

observed during the pandemic regime, which overlaps with the 2022–2023 tightening cycle, also underline the value of contingency planning for systemic shocks.

These implications should be applied with caution, given the single-stock design, the small economic magnitude of the estimated effects and the mechanical link between market capitalization and returns. Future research that replicates the analysis for other large banks and uses a size measure not derived from the same price would help establish how far they generalize.

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