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Interest Rates, Inflation, and Banking Stock Returns: An Error Correction Model Approach

Herman Paleni[1]*, Suyadi[2], Yulpa Rabeta[3], Meiza Marlingga Putri[4]

[1] Master of Management Program, Bina Insan University, Lubuk Linggau, South Sumatra, 31626, Indonesia
[2, 3, 4] Management Program, Bina Insan University, Lubuk Linggau, South Sumatra, 31626, Indonesia

ABSTRACT

Purpose – This study analyzes the long- and short-run relationships between interest rates, inflation, and stock returns in Indonesia's banking sector in Indonesia.
Design/methodology/approach – The research employs monthly time-series data from 2020 to 2024, covering banking listed on the Indonesia Stock Exchange, the study applies stationarity and cointegration tests followed by the Error Correction Model (ECM) to examine short-run dynamics and long-run equilibrium adjustments.
Finding/Results – The results reveal a significant long-run relationship among the variables, indicated by a negative and statistically significant Error Correction Term (ECT). The ECT coefficient, close to –1, suggests rapid adjustment toward equilibrium, while short-run changes in interest rates and inflation do not significantly affect stock returns.
Originality/Value – These findings confirm the dynamic interaction among variables and the importance of the error-correction mechanism in restoring long-run equilibrium. This provides empirical evidence on the short- and long-run effects of macroeconomic variables on banking stock returns in Indonesia, offering insights into macroeconomic influences on sectoral stock performance during the post-pandemic period.

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*Corresponding Author at:
Master of Management Program, Bina Insan University, Lubuk Linggau, South Sumatra, 31626, Indonesia.
E-mail address: herman_paleni@univbinainsan.ac.id

1. Introduction

Capital markets play a fundamental role in modern economies as institutional mechanisms that allocate savings to investment by channeling funds from surplus units to deficit units. This process enables efficient savings–investment matching, supports optimal resource allocation, and contributes to overall financial system stability (Juhro, 2022). In Indonesia, capital-market activities are centralized in the Indonesia Stock Exchange (IDX), which serves as the primary platform for trading and valuing listed companies' equities, including major commercial banks with significant market capitalization and a strategic role in the national economy.

The importance of capital markets becomes particularly pronounced during crisis and post-crisis periods, when economic uncertainty intensifies, and investor sentiment tends to deteriorate. The COVID-19 pandemic demonstrated that stock markets are highly vulnerable to macroeconomic shocks and policy interventions, leading to heightened volatility and depressed equity prices (Ghosh & Bagchi, 2022). Within this context, banking-sector stocks occupy a uniquely strategic position because banks function as the core financial intermediaries that channel funds from savers to the real sector. As a result, banking performance and equity valuations are closely linked to macroeconomic conditions and monetary-policy settings (Febrianti & Setyowati, 2023).

The relationship between monetary policy and financial stability is widely regarded as inseparable. Monetary-policy instruments are designed not only to stabilize the macroeconomy but also to ensure that the financial system allocates resources efficiently without generating systemic instability (Ozili, 2023b). Among these instruments, the policy interest rate plays a central role in the monetary transmission mechanism, with the banking sector serving as the primary conduit through which policy impulses are transmitted to the broader economy and financial markets (Juhro et al., 2022). Consequently, fluctuations in interest rates and inflation are expected to have direct and indirect implications for banking stock returns.

From a theoretical perspective, interest rates influence stock returns through valuation channels, as the risk-free rate is a key component of the discount rate used to value expected future cash flows (Rangvid, 2021). An increase in interest rates raises the required rate of return and exerts downward pressure on equity valuations, particularly over shorter investment horizons. Empirical evidence from emerging markets consistently indicates that stock markets respond to monetary policy shocks in both the short and long run, with interest rates often negatively related to stock market performance (Erer & Erer, 2022).

Inflation, on the other hand, represents both a macroeconomic outcome and a primary target of monetary policy. From an asset-pricing standpoint, inflation can affect stock returns through multiple channels, including changes in production costs, expectations of future earnings, and macroeconomic uncertainty. However, empirical findings suggest that the relationship between inflation and stock market performance is often weak, mixed, or statistically insignificant, particularly in the short run (Megaravalli, 2018). These ambiguities become more pronounced during crisis periods, when interactions between inflation dynamics, monetary policy, and financial markets tend to be nonlinear and unstable.

Empirical studies on Indonesia indicate that macroeconomic variables, such as Bank Indonesia's policy rate and inflation, significantly influenced stock market performance during the COVID-19 period, as reflected in movements of the Jakarta Composite Index (Santoso & Setyowati, 2023). Broader evidence from emerging Asian economies also confirms that monetary policy plays an important role in shaping stock market outcomes, although the

magnitude and direction of these effects vary across time horizons and market conditions (Erer & Erer, 2022). Nevertheless, much of the existing literature concentrates on aggregate market indices or employs static regression approaches, which may fail to capture the dynamic adjustment processes and long-run equilibrium relationships underlying macro–financial interactions, particularly for sector-specific equities such as banking stocks.

The post-pandemic environment underscores the need for a more nuanced understanding of the relationship between interest rates, inflation, and banking stock returns. Post-crisis monetary-policy regimes have been characterized by shifts in interest-rate trajectories and large-scale stabilization measures, potentially altering financial-market behavior relative to pre-pandemic norms. Given the banking sector's central role in the financial system, its equity prices are likely to be especially sensitive to changes in policy rates and inflation, making it essential to distinguish between short-term fluctuations and long-term equilibrium dynamics (Febrianti & Setyowati, 2023).

Against this backdrop, the primary research problem addressed in this study is the limited application of dynamic modeling frameworks that explicitly capture both short-run adjustments and long-run relationships between interest rates, inflation, and banking stock returns in Indonesia. This gap is particularly evident in post-pandemic analyses, where static models may conflate transitory shocks with persistent macro–financial linkages, leading to potentially incomplete or biased inferences (Agu & Asaolu, 2023).

Accordingly, this study aims to examine the effects of interest rates and inflation on banking stock returns listed on the Indonesia Stock Exchange using an Error Correction Model (ECM) framework. The ECM approach is well-suited to this context because it allows simultaneous estimation of long-run equilibrium relationships and short-run dynamics via an explicit error-correction mechanism. This methodological choice aligns with the characteristics of macroeconomic and financial time-series data, which are often non-stationary and subject to substantial short-term volatility (Agu & Asaolu, 2023; Gupta & Kumar, 2019).

The urgency of this research lies in its potential contributions to both academic literature and practical decision-making. Academically, the study enriches the macro–financial literature on Indonesia by providing sector-specific evidence on the sensitivity of banking stocks to monetary-policy and inflation dynamics in the post-pandemic period. In practice, the findings are expected to offer valuable insights for investors in formulating investment strategies across different time horizons, as well as for policymakers in assessing the financial-market implications of monetary policy decisions. By clarifying how banking stock returns respond to changes in interest rates and inflation, this study contributes to a deeper understanding of the monetary–financial stability nexus within Indonesia's capital market framework.

2. Literature Review and Hypothesis Development

Literature Review

Interest Rate

Interest rates are the price of using money over a given period, and the compensation lenders receive for the use of funds. Various studies describe interest rates as a cost that reflects risk, inflation, and opportunity costs for lenders, as well as a key instrument for the transmission of monetary policy through the central bank's policy rate (Alafif, 2023; Vinotha et al., 2025). The pass-through channel of policy interest rates to banking interest rates and asset prices, as well as its impact on investment, consumption, and credit demand, has become a major focus of empirical studies across countries. The literature indicates variations in the speed and strength of the pass-through from policy interest rates to retail bank interest rates and their

subsequent effects on inflation and output in both the short and long run (Chouhan & Singhai, 2025; Thirunavukkarasu & Pradha, 2022; Wandera & Naku, 2020).

Everal references, particularly those examining the BI 7-Day Reverse Repo Rate (BI7DRR), inflation, and its relationship with other monetary variables, suggest that changes in BI7DRR may influence inflation and other macroeconomic variables such as M2, foreign exchange reserves, and the exchange rate. However, the magnitude of these effects may vary across different periods and policy frameworks (Koraag et al., 2024; Lesmana, 2025; Varshini et al., 2024). Empirical evidence from several developing and emerging markets suggests a consistent long-run relationship between interest rates, inflation, and banking sector stock returns. Studies in Nigeria indicate that higher interest rates have a negative long-run effect on banking sector stock prices, reflecting increased funding costs and the impact of higher discount rates on bank valuation (Abdullahi, 2020). Similar findings are reported in Pakistan, where ARDL bounds testing confirms cointegration between interest rates and stock market performance, with the Error Correction Model (ECM) showing gradual adjustment toward long-run equilibrium (Olokoyo et al., 2020).

Inflation

Inflation captures the general price dynamics that signal the interaction between aggregate demand and aggregate supply within an economy and serves as an important barometer of economic stability and the effectiveness of monetary policy. This conceptualization aligns with the conventional view that inflation reflects macroeconomic equilibrium and provides signals regarding policy credibility and the transmission of monetary policy (Saputra, 2024). In this context, inflation targeting frameworks are designed to anchor inflation expectations and maintain price stability, which is considered a fundamental prerequisite for sustainable economic growt (Saputra, 2024). From a broader macroeconomic stability perspective, although monetary policy operates through multiple channels and instruments, maintaining price stability remains a central objective in its design and implementation.

This approach emphasizes the importance of anchoring inflation expectations and maintaining price stability as essential prerequisites for sustainable macroeconomic growth, reflecting Bank Indonesia's broader framework for macroeconomic stability and policy credibility under the ITF regime(Saputra, 2024). Empirical assessments of the Indonesian ITF, incorporating endogenous variables such as the BI Rate, money supply, PUAB/PUAS, and SBIS, indicate that the framework generates measurable effects on inflation dynamics, highlighting the relevance of econometric approaches such as Vector Error Correction Models (VECM) in explaining inflation behavior within the Indonesian monetary policy (Saputra, 2024). Furthermore, the literature highlights potential challenges related to imperfect policy credibility and the sensitivity of disinflation costs to credibility levels, underscoring the importance of effective communication strategies and strong institutional frameworks to ensure that Bank Indonesia's ITF operates as intended.

Stock return

Stock returns are the primary indicator of investors' performance from equity investments, reflecting gains from holding shares over a specific period. In investment theory, stock returns consist of two main components: dividends received during the holding period and capital gains arising from the difference between the selling price and the initial purchase price. This decomposition forms the basis of traditional asset pricing and portfolio analysis, where returns reflect the profitability of investments and the dynamics of expected cash flows and

price changes. In empirical finance, stock returns are commonly modeled using logarithmic (log) returns to stabilize variance and to conform with continuous compounding assumptions. Log returns derived from price data are widely used in monthly empirical studies and asset pricing frameworks, as they facilitate statistical modeling and analysis of volatility dynamics (Yelamanchili, 2020; Zhang, 2023).

In addition to price dynamics, stock returns are also influenced by macroeconomic conditions, particularly monetary policy variables such as the BI 7-Day Reverse Repo Rate (BI-7DRR). The BI-7DRR serves as a key policy instrument for Bank Indonesia to signal liquidity conditions and the stance of monetary policy, thereby affecting financial market expectations and asset valuations. Empirical studies in Indonesia frequently include BI-7DRR as an explanatory macroeconomic variable in stock return models to capture the monetary transmission mechanism linking policy rates, liquidity, and equity prices (Miranda & Robbani, 2023). In empirical applications, stock returns are typically calculated using monthly adjusted closing prices to account for corporate actions such as dividends and stock splits, enabling consistent comparisons across time periods (Yelamanchili, 2020). Furthermore, the literature documents that stock returns often exhibit stylized features such as volatility clustering and non-normal distributions, which motivate the application of advanced econometric models, including GARCH-type frameworks, to analyze return behavior and risk dynamics (Yelamanchili, 2020)

Hypothesis Development

Empirical evidence from several developing and emerging markets suggests a consistent long-run relationship between interest rates, inflation, and banking sector stock returns. Studies in Nigeria indicate that higher interest rates have a negative long-run effect on banking sector stock prices, reflecting increased funding costs and the impact of higher discount rates on bank valuation (Abdullahi, 2020). Similar findings are reported in Pakistan, where ARDL bounds testing confirms cointegration between interest rates and stock market performance, with the Error Correction Model (ECM) showing gradual adjustment toward long-run equilibrium (Olokoyo et al., 2020).

Evidence from Ghana also supports a negative long-run relationship between interest rates and stock returns, often explained through valuation and discount-rate channels affecting banking-sector equities (Olokoyo et al., 2020). Inflation likewise plays an important role in the long-run dynamics of banking-sector stock returns, though its effect varies across markets. In Nigeria, inflation is found to have a positive long-run effect on banking stock prices (Abdullahi, 2020), while studies in Ghana and Tanzania report negative or mixed effects depending on monetary regimes and market structures (Mfugale & Olomi, 2023). Overall, ARDL and VECM-based studies confirm cointegration between macroeconomic variables and banking sector stock returns across multiple markets (Olokoyo et al., 2020).

H_1= Interest rates and inflation exhibit a long-run relationship with the stock returns of the banking sector

Empirical evidence on the short-run relationship between interest rates, inflation, and banking-sector stock returns in Indonesia remains relatively limited within the available literature. Several Indonesian studies instead focus on broader stock market dynamics or different sectoral contexts. For example, research examining the mining subsector using a VECM approach finds that monetary policy variables, including interest rates, exert nuanced short-run effects on subsector stock prices, suggesting that changes in monetary policy can influence stock valuations through interest rate channels (Jannah et al., 2024).

However, because the analysis focuses on mining rather than banking stocks, these findings cannot be considered direct evidence for the banking sector. Other Indonesian macro-finance studies analyze the interaction between macroeconomic variables and banking-related activities. For instance, research employing cointegration and VECM methods shows that interest rates and inflation significantly influence Islamic banking deposits and financing, indicating that macroeconomic monetary variables can transmit to bank-related assets through both long-run relationships and short-run dynamics (Setyowati, 2019). Although these studies do not directly examine banking-sector stock returns, they imply that short-run transmission mechanisms through financial conditions, liquidity, and interest rate adjustments may affect banking-related assets in Indonesia. Consequently, while the literature provides indirect support for short-run macro-financial linkages, more sector-specific empirical studies are required to fully capture the short-run dynamics of Indonesian banking-sector stock returns (Jannah et al., 2024; Setyowati, 2019).
H_2 = Interest rates and inflation exhibit a short-run relationship with the stock returns of the banking sector

3. Methodology

Research Framework

This study aims to examine the impact of interest rates (X_1) and inflation (X_2) on banking sector stock returns (Y) in Indonesia using the Error Correction Model (ECM). The model captures both short-run and long-run dynamics as shown in Figure 1:

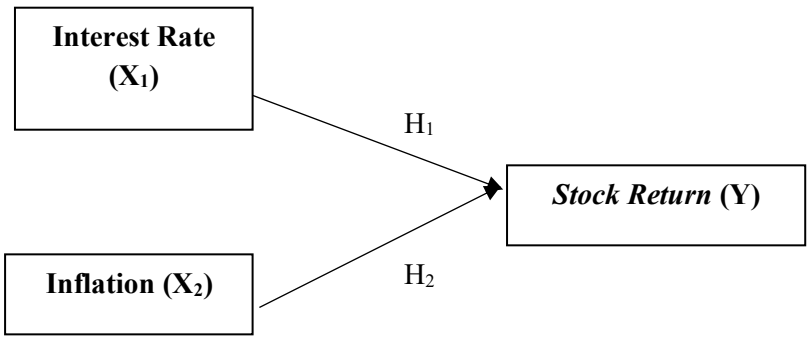

Figure 1. Research Framework

In the long run, interest rates and inflation are expected to maintain a stable relationship with stock returns through cointegration, where temporary deviations adjust toward a long-term equilibrium. The cointegration coefficients measure the sensitivity of stock returns to macroeconomic changes under stable conditions. In the short run, stock returns may deviate due to sudden changes in interest rates and inflation. The Error Correction Term (ECT) models the adjustment from these short-term deviations toward long-term equilibrium. A negative and significant ECT indicates that deviations are corrected, with larger absolute values reflecting faster adjustment.

Research Design

This study employs a quantitative time-series design to examine the effects of interest rates and inflation on banking stock returns in Indonesia using an Error Correction Model (ECM), which captures both short-run adjustments and long-run equilibrium among non-stationary but cointegrated variables (Agu & Asaolu, 2023; Sameera, 2023). The analysis focuses on banking-sector stocks listed on the Indonesia Stock Exchange (IDX/BEI), reflecting the sector's strategic role in monetary-policy transmission and financial stability

(Febrianti & Setyowati, 2023; Juhro, 2022). Banking stock returns are computed from historical price data, while explanatory variables include the Bank Indonesia policy rate and CPI-based inflation, representing key macroeconomic determinants of equity performance (Irwansyah et al., 2023). Secondary monthly time-series data are sourced from authoritative institutions, including IDX, Bank Indonesia, Statistics Indonesia, and Yahoo Finance, with frequency alignment ensuring data consistency. Unit-root and cointegration testing are applied to validate stationarity and long-run relationships before ECM estimation (Agu & Asaolu, 2023; Gupta & Kumar, 2019). This framework allows the simultaneous evaluation of short-run market responses and long-run adjustments, enhancing the robustness of empirical inference in a volatile financial environment.

Data analysis

This study employs a cointegration-based time-series econometric approach using the Error Correction Model (ECM) to examine the relationship between interest rates, inflation, and banking stock returns in Indonesia (Ekananda, 2018, 2019). The analysis using the tool with Eviews(Ghozali & Ratmono, 2017), begins with Augmented Dickey–Fuller (ADF) unit-root tests to assess the stationarity properties of the variables, followed by residual-based cointegration testing to determine the existence of a stable long-run equilibrium relationship, thereby avoiding spurious inference associated with non-stationary time series (Agu & Asaolu, 2023; Fernandes, 2023; Gupta & Kumar, 2019; Hair et al., 2023). Upon confirmation of cointegration, the ECM is estimated by incorporating short-run changes in interest rates and inflation alongside an error correction term (ECT) derived from the long-run relationship, allowing simultaneous identification of short-run dynamics and long-run adjustment behavior **(Ekananda, 2019)**. A negative and statistically significant ECT indicates convergence toward equilibrium, while short-run coefficients capture immediate market responses to macroeconomic shocks in a volatile financial environment, consistent with established macro–financial time-series analysis (Agu & Asaolu, 2023; Rangvid, 2021).

4. Results and Discussion

Result

Data Stationarity Test

The stationarity test is an important initial step in Error Correction Model (ECM) analysis to ensure that the time series data used have constant means and variances over the observation period. In this study, stationarity was tested using the Augmented Dickey-Fuller (ADF) test at the 5 percent significance level (Hair et al., 2023). The decision criterion is based on the probability value (p-value), where the data are considered stationary if the ADF probability value is less than 0.05.

The summary of the data stationarity test results is presented in the table below;

Table 1. The summary of the data stationarity test

Variable	Level (I(0))	First Difference (I(1))	Order of Integration	Remarks
Stock Return (RET)	Stationary (Prob. = 0.0000)	–	I(0)	Stationary at level

BI-7 Day Reverse Repo Rate (BI-7DRR)	Non-stationary (Prob. = 0.8048)	Stationary (Prob. = 0.0051)	I(1)	Stationary at first difference
Inflation	Non-stationary (Prob. = 0.3570)	Stationary (Prob. = 0.0003)	I(1)	Stationary at first difference

Source: Data processed by the researcher using EViews, 2025

The stationarity of the variables was examined using the Augmented Dickey–Fuller (ADF) test to determine their integration orders, a prerequisite for cointegration and error-correction modeling. The results indicate that stock returns (RET) are stationary at level (I(0)), with a test probability of 0.0000, suggesting that the series does not require differencing and exhibits stable statistical properties over time. In contrast, the Bank Indonesia 7-Day Reverse Repo Rate (BI-7DRR) is non-stationary in levels (Prob. = 0.8048) but becomes stationary after first differencing (I(1), Prob. = 0.0051), indicating that it follows a stochastic trend and requires differencing to achieve stationarity. Similarly, inflation is non-stationary at the level (Prob. = 0.3570) but becomes stationary after first differencing (I(1), Prob. = 0.0003), confirming that it too is integrated of order one. Overall, these findings imply that the ECM framework is appropriate, as it accommodates variables with mixed integration orders, allowing for the modeling of both long-run equilibrium relationships and short-run dynamics among stationary and non-stationary time series (Agu & Asaolu, 2023; Gupta & Kumar, 2019).

Cointegration Test

In this study, the cointegration test was conducted using the Engle–Granger method, which involves estimating the long-run equation using the Ordinary Least Squares (OLS) method and subsequently testing the stationarity of the residuals from the long-run equation using the Augmented Dickey-Fuller (ADF) test.

The summary of the cointegration test results is presented in the table below;

Table 2. The summary of the cointegration test

Testing Stage	Method	Main Indicator	Result	Remarks
Long-run estimation	OLS	Coefficients of BI-7DRR and Inflation	Statistically insignificant	Used to generate residuals (ECT) in accordance with the Engle–Granger procedure
Residual stationarity test	ADF Test	ADF statistic = −7.347832	Significant	More negative than the critical values at the 1%, 5%, and 10% significance levels
ADF probability value	ADF Test	Prob = 0.0000	< 0.05	Rejects the null hypothesis (residual does not contain a unit root)

Testing Stage	Method	Main Indicator	Result	Remarks
Residual properties (ECT)	–	Stationary at level	Yes	Residual is integrated of order I(0)
Cointegration conclusion	Engle–Granger	Long-run relationship	Exists	Stock returns, BI-7DRR, and inflation are cointegrated
Model implication	–	ECM applicability	Satisfied	The ECM is appropriate for short-run and long-run analysis

Source: Data processed by the researcher using EViews, 2025

The long-run relationship among stock returns, the BI 7-Day Reverse Repo Rate (BI-7DRR), and inflation was examined using the Engle–Granger two-step procedure. In the first step, ordinary least squares (OLS) was applied to estimate the long-run coefficients of BI-7DRR and inflation, which were found to be statistically insignificant; the estimated residuals were then used to construct the error correction term (ECT) . The second step involved testing the stationarity of the residuals using the Augmented Dickey–Fuller (ADF) test, which yielded a test statistic of −7.347832 and a probability value of 0.0000, both indicating significance at the 1%, 5%, and 10% levels and leading to rejection of the null hypothesis that the residual contains a unit root. These results confirm that the residuals (ECT) are stationary at level (I(0)), satisfying the key condition for cointegration. Consequently, it can be concluded that stock returns, BI-7DRR, and inflation are cointegrated, indicating a stable long-run equilibrium relationship among the variables. This finding validates the applicability of the Error Correction Model (ECM), which can now be used to simultaneously capture short-run dynamics and long-run adjustments in banking stock returns (Agu & Asaolu, 2023; Gupta & Kumar, 2019).

Estimation of the Error Correction Model (ECM)

The summary of the Estimation of the Error Correction Model (ECM) test results is presented in the table below;

Table 3. Estimation of the Error Correction Model (ECM) test

Model Component	Variable	Coefficient	Probability	Significance	Interpretation
Short-run effect	BI-7DRR	−0.007758	0.8705	Not significant	Changes in the interest rate do not have a significant short-run effect on stock returns
Short-run effect	Inflation	−0.009601	0.7099	Not significant	Changes in inflation do not have a significant short-run effect on stock returns

Model Component	Variable	Coefficient	Probability	Significance	Interpretation
Adjustment mechanism	ECT (−1)	−0.971468	0.0000	Significant (1%)	Indicates a strong adjustment mechanism toward long-run equilibrium
Constant	C	0.000865	0.9078	Not significant	The constant term does not have a meaningful effect in the model
Model adequacy	F-statistic	1.744.845	0.0000	Significant	The ECM is statistically valid
Explanatory power	Adjusted R^2	0.459688	–	–	Approximately 46% of short-run variations in stock returns are explained by the model

Source: Data processed by the researcher using EViews, 2025

The Error Correction Model (ECM) results indicate that the short-run effects of macroeconomic variables on banking stock returns are statistically insignificant. Specifically, changes in the BI 7-Day Reverse Repo Rate (BI-7DRR) (coefficient = −0.007758; Prob. = 0.8705) and inflation (coefficient = −0.009601; Prob. = 0.7099) do not exert meaningful short-term impacts on stock returns, suggesting that immediate market responses to these variables are limited. In contrast, the error correction term (ECT(−1)) is negative and highly significant at the 1% level (coefficient = −0.971468; Prob. = 0.0000), indicating a strong adjustment mechanism that corrects deviations from the long-run equilibrium. The constant term is not significant (C = 0.000865; Prob. = 0.9078), reflecting that the baseline level does not meaningfully influence short-run dynamics. Overall, the model demonstrates adequate statistical validity (F-statistic = 1,744.845; Prob. = 0.0000) and explains approximately 46% of the short-run variations in banking stock returns (Adjusted R^2 = 0.4597), confirming that the ECM effectively captures the interplay between short-run fluctuations and long-run adjustment processes (Agu & Asaolu, 2023; Gupta & Kumar, 2019; Rangvid, 2021).

Feasibility test of the Error Correction Model (ECM)

The model adequacy test is conducted to ensure that the Error Correction Model (ECM) used in this study meets statistical and econometric criteria and is therefore appropriate for explaining the relationship between the independent and dependent variables. The model adequacy tests include the F-test, t-test, and the coefficient of determination (Adjusted R^2).

A. F-Test (Simultaneous Significance Test)

The empirical results presented in Table 3 indicate that the Prob (F-statistic) value of 0.0000 leads to rejection of the null hypothesis at the 5% significance level, suggesting that

the Error Correction Model (ECM) specification is appropriate for analyzing the short-run dynamics of stock returns. Within the ECM framework, a significant F-statistic implies that the set of explanatory variables, including lagged differences and the Error Correction Term (ECT), jointly explain variations in the dependent variable. This interpretation is consistent with the theoretical foundation of ECM, which states that when variables are cointegrated, the ECM provides a valid representation of short-run adjustments toward long-run equilibrium (Ölçen, 2023). Empirical studies also demonstrate the widespread application of ECM following cointegration tests, where the significance of the ECT reflects the speed of adjustment back to equilibrium, while the short-run coefficients capture immediate macroeconomic influences on stock returns (Olayode et al., 2021). Therefore, the significant F-statistic in this study supports the view that BI-7DRR, inflation, and the ECT collectively possess explanatory power in modeling short-run fluctuations in stock returns.

Furthermore, the inclusion of BI-7DRR and inflation within the ECM specification is consistent with the broader macro-finance literature examining the relationship between monetary variables and stock market performance. Many studies report that inflation often exerts a negative short-run effect on stock returns, while the ECT typically carries a negative, significant coefficient, indicating a gradual correction of disequilibrium toward long-run equilibrium (Arifin et al., 2023). Similarly, policy interest rates, such as BI-7DRR, frequently display a negative short-run relationship with stock returns due to the discount-rate channel and the opportunity cost of holding equities during periods of tighter monetary policy (Asravor & Fonu, 2020). These findings align with the ECM framework widely used in macroeconomic studies, which demonstrates that stock returns respond to macroeconomic shocks in the short run while gradually converging to a long-run equilibrium path (Inegbedion et al., 2020; Kumar, 2024).

T-test (Partial Significance Test)

The t-test is used to examine the partial effect of each independent variable on the dependent variable. Taken together, the reported ECM results, characterized by a negative and statistically significant ECTt−1 alongside insignificant short-run coefficients for ΔBI-7DRR and Δinflation, are consistent with the theoretical and empirical foundations of the Error Correction Model. In the ECM framework, a negative and significant error-correction coefficient indicates that deviations from the long-run equilibrium are gradually corrected over time, implying the existence of a stable adjustment mechanism even when short-run effects of explanatory variables are not statistically significant. Empirical studies examining macroeconomic determinants of stock-related outcomes in Indonesia frequently report similar patterns, where long-run cointegration and a significant ECT confirm model validity despite muted short-run dynamics (Shifa, 2025). Several authors also emphasize that short-run macroeconomic effects may appear insignificant due to variations in data frequency, sample periods, or sectoral scope. At the same time, the ECM structure continues to capture a robust long-run relationship between macro variables and financial outcomes (Shifa, 2025).

At the same time, the broader literature indicates that the significance and direction of short-run macroeconomic coefficients, such as inflation and interest rates, may vary across empirical contexts and model specifications. Some Indonesian and regional studies find that inflation and interest rate changes can exhibit short-run effects on stock returns during particular periods or subsamples, even when the long-run equilibrium

relationship is confirmed by a negative and significant ECT (Ojiako, 2021). Differences in empirical outcomes are commonly attributed to variations in data frequency (e.g., monthly versus quarterly observations), sample windows, or structural shifts such as financial crises or changes in monetary policy regimes. Consequently, many studies recommend reporting detailed model diagnostics, including p-values and stability checks across alternative lag structures or subsamples, to ensure the robustness of ECM estimations (Shifa, 2025). Furthermore, cointegration evidence is often strengthened by complementary approaches, such as Johansen or Engle-Granger tests, to confirm the presence of a stable long-run relationship among the variables under investigation (Shifa, 2025).

Coefficient of Determination (Adjusted R^2)

The empirical results indicate that approximately 46% of the variation in stock returns can be explained by the variables included in the model, while the remaining 54% is attributed to factors outside the specified framework. In macro-finance studies, such a level of explanatory power is generally acceptable because stock returns are influenced by a wide range of determinants beyond a limited set of macroeconomic variables. These include market sentiment, global economic conditions, firm-specific fundamentals, and other policy or financial shock that are not directly captured in the model specification (Sajor et al., 2023). Within the VECM framework, the Error Correction Term (ECT) plays a crucial role in capturing the speed at which deviations from the long-run equilibrium are corrected in each period. The ECT sign and statistical significance provide evidence of an adjustment mechanism that ensures convergence toward the cointegrating relationship among the variables (Lee & Brahmasrene, 2018). Therefore, even when the explanatory variables account for only part of the variation in stock returns, the presence of a significant ECT confirms the existence of a stable long-run equilibrium within the model.

The broader literature also emphasizes that stock return dynamics are inherently complex, and a substantial portion of their variation often remains unexplained by a small set of macroeconomic indicators. Empirical studies applying VECM to stock markets across different countries consistently report that macroeconomic variables, such as interest rates, inflation, and exchange rates, affect stock returns through both short-run fluctuations and long-run equilibrium adjustments (Ahiadorme et al., 2019). However, the magnitude and statistical significance of these effects often vary with data frequency, sample periods, and country-specific economic conditions (Koirala & Abdullah, 2023). Consequently, an adjusted R2 in the mid-range, such as around 46%, is not unusual in macro-stock return models that rely on a limited number of explanatory variables (Ahiadorme et al., 2019). ariance decomposition analyses in related studies further show that a considerable share of forecast error variance is often driven by external shocks or omitted variables, reinforcing the idea that stock market movements are shaped by broader financial and economic forces beyond the core macro variables included in the model (Akel & CISSE, 2023; Bhattacharjee & Das, 2021).

Discussion

The Long-Run Effect of Interest Rates and Inflation on Stock Returns

The analysis of the long-run relationship using the Error Correction Model (ECM) begins with estimating a long-run (levels) equation to represent the equilibrium linkage among

stock returns, interest rates, and inflation, with deviations from this equilibrium captured in the error correction term (ECT) for short-run modeling (Agu & Asaolu, 2023; Gupta & Kumar, 2019). This approach aligns with standard time-series methodology, where cointegration testing is required to distinguish a stable long-run relationship from short-run fluctuations (Agu & Asaolu, 2023; Gupta & Kumar, 2019) allowing meaningful interpretation of the ECT as a mechanism that restores equilibrium following shocks (Agu & Asaolu, 2023; Gupta & Kumar, 2019). In macro-financial contexts such as the Indonesian banking sector, where commercial banks are actively traded on the IDX and play a central role in financial intermediation, this decomposition is particularly appropriate, given that stock returns can be volatile in the short run while exhibiting structured long-run behavior (Febrianti & Setyowati, 2023; Juhro, 2022; Ozili, 2023a; Rangvid, 2021).

The cointegration analysis confirms the presence of a stable long-run equilibrium among the variables, as evidenced by the stationarity of residuals (ADF statistic = −7.347832, Prob = 0.0000), validating the applicability of the ECM framework (Agu & Asaolu, 2023; Gupta & Kumar, 2019; Saraswat & Madhav, 2023). Empirically, the ECT coefficient is negative and highly significant (−0.971468, $p < 0.01$), indicating that deviations from long-run equilibrium are rapidly corrected, with approximately 97% of prior-period disequilibrium adjusted within a single period (Agu & Asaolu, 2023; Gupta & Kumar, 2019). This rapid adjustment mechanism demonstrates that, while short-run shocks in stock returns may arise from changes in interest rates or inflation, the system exhibits strong reversion to equilibrium, reflecting the stability of macro-financial linkages over time (Rangvid, 2021).

Notably, the individual long-run coefficients for interest rates and inflation are not statistically significant, yet the significant, negative ECT confirms that the overall long-run equilibrium persists. This finding is consistent with cointegration-based frameworks, in which equilibrium dynamics are captured by the ECT rather than by the significance of each long-run slope coefficient (Agu & Asaolu, 2023; Gupta & Kumar, 2019). Empirical macro–stock market studies similarly show that short-term relationships of individual macro variables may be weak, while the system as a whole maintains structured long-run behavior (Rangvid, 2021).

From a practical perspective, these results have clear implications for the Indonesian banking sector. Given the central role of banks in channeling funds and the responsiveness of their stock prices to monetary policy, the negative and significant ECT indicates that banking stock returns are dynamically linked to macroeconomic conditions, with interest rates and inflation influencing re-equilibration after shocks (Febrianti & Setyowati, 2023; Juhro, 2022; Ozili, 2023a; Saraswat & Madhav, 2023). The ECM findings support the use of dynamic models to capture both short-run volatility and long-run stability in equity prices, providing empirical evidence that Indonesian banking stocks adjust quickly toward a long-run path determined jointly with key macroeconomic variables, even when individual long-run coefficients appear insignificant in isolation (Agu & Asaolu, 2023; Gupta & Kumar, 2019).

The Short-Run Effect of Interest Rates and Inflation on Stock Returns

In the Error Correction Model (ECM) framework, short-run dynamics are captured by the coefficients on the first-differenced independent variables, while the Error Correction Term (ECT) represents the adjustment toward long-run equilibrium (Agu & Asaolu, 2023;

Gupta & Kumar, 2019; Sameera, 2023). The estimated coefficients for changes in the Bank Indonesia policy rate (BI-7DRR) and inflation (CPI) are statistically insignificant, with p-values of 0.8705 and 0.7099, respectively, indicating that short-run fluctuations in these macroeconomic variables do not exert a detectable immediate effect on banking stock returns within the observation period (Gupta & Kumar, 2019; Sameera, 2023). This finding is consistent with broader empirical evidence suggesting that macroeconomic variables often have limited explanatory power over equity movements at short horizons, even when long-run relationships are established (Megaravalli, 2018; Rangvid, 2021).

Several factors may account for the weak short-run effects. First, equity markets are inherently volatile in the short term, and near-term price changes are often dominated by market sentiment, risk repricing, and idiosyncratic shocks rather than contemporaneous macroeconomic adjustments (Ghosh & Bagchi, 2022; Rangvid, 2021). Second, monetary policy transmission operates with time lags and through multiple channels, including balance-sheet adjustments, evolving expectations, and financial conditions, rather than inducing instantaneous effects on stock returns (Adil et al., 2021; Juhro, 2022; Ozili, 2023a). Third, bank-specific fundamentals, such as profitability, cash flow, and dividend policies—can dominate short-run return dynamics, particularly in the Indonesian banking sector where listed commercial banks are actively valued on the IDX (Febrianti & Setyowati, 2023). Consequently, marginal short-term variations in macro variables may not immediately translate into observable changes in banking stock prices (Febrianti & Setyowati, 2023; Rangvid, 2021).

Despite the insignificance of the short-run coefficients, the ECT is negative and highly significant, confirming the presence of a robust mechanism that corrects deviations from long-run equilibrium (ECT = −0.971468, $p < 0.01$) (Agu & Asaolu, 2023; Gupta & Kumar, 2019; Saraswat & Madhav, 2023). This demonstrates that while short-run shocks from macroeconomic changes may be statistically weak, the system dynamically restores equilibrium, ensuring that banking stock returns converge toward a long-run path jointly determined with interest rates and inflation (Agu & Asaolu, 2023; Gupta & Kumar, 2019; Saraswat & Madhav, 2023). In other words, the ECM framework reconciles weak short-run macroeconomic effects with strong long-run relationships, highlighting the importance of horizon-dependent modeling for understanding the interplay between macro-financial conditions and banking-sector equity performance (Erer & Erer, 2022; Megaravalli, 2018; Rangvid, 2021).

Finally, with respect to hypothesis testing, the statistically insignificant short-run coefficients imply that Hypothesis H2, asserting the existence of an immediate short-run relationship between macro variables and banking stock returns, cannot be accepted. Nevertheless, the significant ECT confirms that a stable long-run linkage exists, with systematic adjustment toward equilibrium occurring over time, consistent with established ECM/VECM modeling principles (Agu & Asaolu, 2023; Gupta & Kumar, 2019; Saraswat & Madhav, 2023). These results underscore the need to distinguish between short-run volatility and long-run structure when analyzing banking stock returns under macroeconomic and monetary influences, particularly in emerging markets such as Indonesia.

5. Conclusion

Conclusion

Based on the results of the Error Correction Model (ECM) analysis examining the relationship between interest rates, inflation, and stock returns in the banking sector listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period, the following conclusions can be drawn: First: There is a long-run relationship between interest rates, inflation, and banking sector stock returns in Indonesia. This is evidenced by the Error Correction Term (ECT), which is negative and statistically significant, with a coefficient close to −1. This finding indicates the presence of a strong adjustment mechanism, whereby deviations from long-run equilibrium are rapidly corrected toward it.

Second: In the short run, changes in interest rates and inflation do not have a significant effect on banking sector stock returns. This result suggests that the stock market does not respond instantaneously to changes in macroeconomic variables. Instead, short-term fluctuations in stock returns are more strongly influenced by other factors, such as firm fundamentals**,** market sentiment, global economic conditions, and investor expectations and behavior.

Overall, these findings highlight that although macroeconomic variables may not exert a significant short-term influence on stock returns, their long-run relationship remains important in explaining the dynamics of banking sector stock returns in Indonesia. Therefore, the ECM approach is considered appropriate and valid for analyzing both short-run dynamics and long-run equilibrium relationships between macroeconomic variables and stock returns.

Research Limitations

This study is limited by the inclusion of only two macroeconomic variables, interest rates and inflation, in explaining stock return movements. In practice, stock returns are influenced by broader factors, such as exchange rates, economic growth, global financial conditions, firm fundamentals, and investor sentiment, that are not incorporated into this model.

Another limitation is the sample's scope, which focuses exclusively on the banking sector listed on the Indonesia Stock Exchange. As industries respond differently to macroeconomic changes due to varying business characteristics and risk exposures, the findings may not fully reflect stock return behavior in other sectors.

Furthermore, the study covers the 2020–2024 period, characterized by unusual economic conditions following the COVID-19 pandemic. These circumstances may influence macroeconomic stability and market behavior. Additionally, the ECM approach assumes linear relationships, potentially limiting its ability to capture nonlinear dynamics or structural changes in financial markets.

Suggestions and Directions for Future Research

Further research may also expand the scope of analysis beyond the banking sector by including multiple industries listed on the Indonesia Stock Exchange. A broader sectoral comparison could reveal whether the relationship between macroeconomic variables and stock returns differs across industries with distinct characteristics and risk exposures.

Future studies are encouraged to incorporate additional macroeconomic and financial variables, such as exchange rates, economic growth, money supply, and global market indicators. Including these variables may provide a more comprehensive understanding

of the factors influencing stock returns in the Indonesian capital market. Future studies are also recommended to extend the observation period and consider alternative econometric approaches. Methods such as nonlinear models or structural break analysis may better capture changing market dynamics, particularly during periods of economic instability, thereby providing deeper insights into stock return behavior.

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It is hoped that the findings of this study will contribute to the advancement of econometric research, particularly in the application of the Error Correction Model (ECM), and serve as a reference for future studies and a consideration for stakeholders in economic and financial decision-making.

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