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The Impact of Federal Reserve Interest Rates and Exchange Rate Fluctuations on Digital Bank Stock Prices: Evidence from Indonesia

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ABSTRACT

Introduction/Main Objectives: This study examines the effects of Federal Reserve interest rates and the Rupiah exchange rate on the stock prices of digital banks listed on the Indonesia Stock Exchange (IDX) during 2021–2023, amid rapid growth in financial technology and digital banking services. **Background Problems:** The decline in digital bank stock prices during 2021–2023 raises questions about how global macroeconomic conditions influenced digital bank stock performance in Indonesia. **Novelty:** This study specifically focuses on Indonesia's digital banking sector, which remains under-researched regarding macroeconomic influences during the post-pandemic digital banking expansion period. **Research Methods:** This study uses a quantitative approach with panel-data regression analysis and classical assumption tests on secondary data from seven digital banks listed on the IDX during 2021–2023. **Finding/Results:** The results indicate that Federal Reserve interest rates and the Rupiah exchange rate have negative but insignificant effects on digital bank stock prices. The R^2 value shows that these variables explain only 20% of stock price variation, indicating a stronger influence from firm-specific factors. **Conclusion:** This study concludes that macroeconomic variables are not the primary determinants of digital bank stock prices in Indonesia. Investors and policymakers should therefore pay greater attention to internal business and sector-specific factors.

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1. Introduction

In recent years, the evolution of financial technology has catalyzed the emergence of digital banks in Indonesia, including Bank Jago, Bank Aladin Syariah, Allo Bank Indonesia, Bank Neo Commerce, Bank Dinar Indonesia, Bank Capital Indonesia, and Bank Raya Indonesia. These institutions have attracted attention by offering innovative, technology-driven services without physical branches, thereby enhancing banking accessibility for the broader population. This development has spurred increased investor interest in digital bank stocks listed on the Indonesia Stock Exchange (IDX).

However, despite digital banks' promising growth trajectory, the sector saw a notable decline in stock prices between 2021 and 2023. For instance, Bank Jago's share price peaked at around Rp2,000 per share at the end of 2021 and subsequently fell to approximately Rp800 per share by late 2023, reflecting a decline of about 60%. Similarly, Bank Neo Commerce's stock price dropped from roughly Rp1,500 in 2021 to Rp600 in 2023, while Allo Bank's shares decreased from around Rp1,800 to Rp700 over the same period. These figures indicate that despite strong operational growth and market optimism, valuations corrected as investors recalibrated expectations in response to evolving macroeconomic conditions, competitive pressures, and concerns about profitability timelines (OECD, 2023).

The downturn in corporate performance is significantly influenced by both internal factors and external macroeconomic conditions, particularly the Federal Reserve's interest rate policies and fluctuations in the Rupiah-to-US Dollar exchange rate. Research indicates that changes in global financial conditions, such as tightening monetary policies, can increase exchange rate volatility, especially in developing countries, where currencies are more susceptible to external shocks (Eguren-Martin & Sokol, 2022). Additionally, the interplay between economic policy uncertainty and exchange rate volatility suggests that rising uncertainty can exacerbate exchange rate fluctuations, further impacting corporate performance (Wang et al., 2023). Elevated interest rates from the Federal Reserve can lead to capital outflows from emerging markets, including Indonesia, exerting downward pressure on stock prices. Additionally, Rupiah depreciation against the US Dollar increases operational costs for companies with US Dollar-denominated obligations, adversely affecting their financial health. For instance, the Rupiah depreciated by approximately 5.7% against the US Dollar in 2022 alone, significantly increasing corporate liabilities denominated in foreign currency (World Bank, 2023).

The decline in digital bank stock prices, despite stable macroeconomic conditions in Indonesia, reveals an important empirical gap. During the study period, Indonesia recorded average GDP growth of approximately 5.1% (2021–2023), with inflation remaining moderate at around 3–4%, indicating overall macroeconomic stability. However, digital bank stocks continued to experience volatility and

price corrections. This divergence suggests that non-macroeconomic factors, including global monetary tightening, heightened risk aversion toward technology-oriented financial firms, and foreign exchange pressures, played a more significant role in shaping investor sentiment and stock performance (IMF, 2023).

This study addresses this research gap by explicitly examining the extent to which external macro-financial factors, namely the Federal Reserve's interest rate policy and Rupiah–US Dollar exchange rate fluctuations, influence the stock prices of seven digital banks listed on the Indonesia Stock Exchange (IDX) during the 2021–2023 period. By focusing on these global transmission channels, this research clarifies whether the observed decline in digital bank stock valuations stems from international monetary spillovers rather than domestic macroeconomic fundamentals, thereby refining the empirical understanding of investor behavior in emerging digital banking markets. By examining these external factors, the research aims to provide investors and market participants with deeper insights into how macroeconomic variables affect stock valuations in Indonesia's digital banking sector. Specifically, this research aims to: (1) identify and evaluate the extent to which Federal Reserve interest rates and exchange rate fluctuations impact digital bank stock prices, and (2) offer actionable recommendations to stakeholders for mitigating these macroeconomic risks. This research is novel in its focus on the intersection of global macroeconomic influences and Indonesia's nascent digital banking industry, offering a nuanced understanding of the vulnerabilities and resilience of digital bank stocks amid external economic pressures. A cross-country comparison could also clarify how regulatory frameworks shape investor responses to macroeconomic signals in digital banking.

2. Literature Review

2.1 Hypothesis Development

The Federal Reserve's Interest Rates and Stock Prices

The Federal Reserve's interest rate policy plays a critical role in shaping stock prices through multiple transmission channels, particularly by influencing investor risk appetite, portfolio allocation, and firms' financing conditions. Unexpected monetary easing generally increases investors' risk tolerance, thereby stimulating equity demand and driving stock prices upward (Bauer et al., 2023). Empirical evidence from developed markets, such as the United States, indicates that expansionary monetary policy and lower interest rates are associated with positive stock market responses. In contrast, stock markets in developing economies tend to be less sensitive to such policy shifts (Sova & Lukianenko, 2022). Consistent with this view, Bernanke & Kuttner (2005) document an average 1.3% increase in the S&P 500 following an unanticipated 25-basis-point cut in the federal funds rate, while unexpected rate hikes increase market volatility due to heightened investor risk aversion (Lobo, 2002).

Nevertheless, the impact of interest rate changes on stock prices is not uniform and varies across firm characteristics and economic conditions. Younger and growth-oriented firms, particularly those with limited dividend payments, are more sensitive to monetary policy shocks, as interest rate changes directly affect their borrowing costs, investment capacity, and capital expenditure decisions (Cloyne et al., 2023). Moreover, during periods of economic uncertainty or downturn, interest rate cuts may signal weakening macroeconomic fundamentals, potentially generating adverse stock price reactions (Kontonikas et al., 2013). This sensitivity is further amplified for financially constrained firms, whose cash flow expectations and valuation are closely linked to shifts in monetary policy (Maio, 2014). Accordingly, this study hypothesizes that changes in the Federal Reserve's interest rates significantly influence firm stock prices, with the direction and magnitude of the effect contingent upon prevailing economic conditions and firms' financial constraints.

H1: The Federal Reserve's interest rates affect stock prices

Exchange Rate and Stock Prices

The interplay between exchange rates and stock prices is multifaceted and varies significantly across economic contexts and market conditions. Empirical evidence suggests that exchange rate shocks affect stock prices asymmetrically. While small exchange rate fluctuations often lead to positive stock price movements, larger shocks can yield mixed or negative outcomes, particularly during periods of extreme volatility (Odionye et al., 2024). In small open economies, exchange rate variations can prompt immediate stock price adjustments, although markets generally converge to baseline levels over the long term (Yang, 2017).

Moreover, the relationship between exchange rates and stock prices is characterized by bidirectional risk spillovers, particularly in emerging markets. In these markets, a positive correlation has been noted, especially in response to exchange rate movements relative to major currencies like the US dollar (Reboredo et al., 2016). Additionally, stock markets exert a significant influence on exchange rates over the long term, as shown in the UK, where stock market performance has been shown to drive currency value fluctuations (Litsios, 2013). At a microeconomic level, firm-specific and industry-specific factors remain crucial in determining exchange rate exposure. This underscores the persistence of idiosyncratic influences on exchange rate-stock price dynamics, even in highly integrated capital markets (Dominguez & Tesar, 2001).

Given these complexities, this study hypothesizes that exchange rate changes significantly affect stock prices, with the magnitude and direction of the impact moderated by the size of the exchange rate shock, market characteristics, and firm-specific factors. Furthermore, the bidirectional

nature of the exchange rate-stock price relationship suggests that stock market performance may also influence exchange rate movements over the long term.

H1: Exchange Rate Fluctuations affect stock prices

3. Method, Data, and Analysis

This study uses a quantitative research design to analyze the direct effects of the Federal Reserve's interest rates and fluctuations in the Rupiah-to-US Dollar exchange rate on the stock prices of seven digital banks listed on the Indonesia Stock Exchange (IDX) during 2021–2023. The analysis integrates cross-sectional and time-series dimensions using a panel-data approach to evaluate these relationships comprehensively. By leveraging panel data, this study captures both the temporal and individual variations across the selected banks, providing a robust framework for assessing macroeconomic influences on stock performance.

The data set comprises two main components. First, stock prices, represented by daily closing prices of digital bank stocks (Bank Jago, Bank Aladin Syariah, Allo Bank Indonesia, Bank Neo Commerce, Bank Dinar Indonesia, Bank Capital Indonesia, and Bank Raya Indonesia), sourced from IDX. Second, macroeconomic indicators, including quarterly Federal Funds Rate data obtained from the Federal Reserve Economic Data (FRED) and daily Rupiah-to-US Dollar exchange rates sourced from Bank Indonesia. These macroeconomic variables were selected because they significantly affect capital flows, investment decisions, and market liquidity in emerging economies such as Indonesia.

In addition to stock prices and macroeconomic indicators, this study considers control variables such as inflation rates, GDP growth, and domestic interest rates, which may also influence stock market movements. Including these factors helps isolate the effects of external macroeconomic variables while accounting for domestic economic conditions. The findings aim to provide valuable insights into the extent to which global financial factors shape digital bank stock performance, offering a deeper understanding for investors, policymakers, and financial analysts navigating Indonesia's evolving banking sector.

The analysis involves three key stages. The first stage is descriptive analysis, which provides an overview of stock price trends and patterns in macroeconomic variables during the study period. The second stage focuses on panel regression analysis to evaluate the direct effects of Federal Reserve interest rates and exchange rate fluctuations on digital bank stock prices. The regression model is specified as:

$$StockPrice_{it} = \alpha + \beta_1 FedRatet + \beta_2 ExchangeRatet + \epsilon_{it} \quad (1)$$

The study incorporates classical assumption tests to ensure the regression model's reliability and robustness. These tests include the normality test, which verifies that the residuals follow a normal

distribution, and the multicollinearity test, which evaluates whether the independent variables are highly correlated, using variance inflation factors (VIF) as a diagnostic measure. Additionally, the heteroscedasticity test assesses whether residual variance remains constant across observations, using methods such as the Breusch-Pagan or White tests. Furthermore, the autocorrelation test examines correlation between residuals in a time-series context using the Durbin-Watson statistic. By meeting these classical assumptions, the study enhances the robustness of its regression analysis and ensures the validity of its findings. This rigorous methodology offers precise insights into the direct effects of macroeconomic factors on the stock performance of digital banks in Indonesia.

4. Result and Discussion

4.1 Result

The descriptive statistics in Table 1 provide an overview of the data used in this study. The average stock price of digital banks during the observation period was IDR 2,131.19, with a standard deviation of IDR 3,585.27. The highest stock price recorded was IDR 16,000, while the lowest was IDR 121. The Federal Reserve interest rate averaged 3.42% (SD = 2.33%), and the Rupiah-to-US Dollar exchange rate averaged IDR 14,091.67 (SD = IDR 154.25). These figures indicate significant variability in both the dependent and independent variables.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean
Stock Price	21	121	16,000	2,131.19
Interest Rate	21	0.25	5.50	3.42
Exchange Rate	21	13,901	14,269	14,091.67
Valid N (listwise)	21			

Source: Data processed by researchers

The normality test results assessed using the Normal P-P Plot and histogram of residuals suggest that the residuals are approximately normally distributed. This is supported by the near alignment of points along the diagonal line in the P-P Plot and a bell-shaped histogram. Consequently, the normality assumption is fulfilled.

The diagnostic tests confirm that the classical regression assumptions are satisfied: the normality assumption is met, multicollinearity remains within acceptable limits (VIF = 6.413; tolerance = 0.156), no heteroskedasticity is detected based on the residual scatterplot, and the Durbin–Watson statistic indicates no significant autocorrelation.

The multiple linear regression results yield a coefficient of determination (R^2) of 0.200, indicating that only 20% of the variation in digital bank stock prices is explained by changes in the Federal Reserve's interest rates and the Rupiah–US Dollar exchange rate. In comparison, the remaining 80% is

driven by factors outside the model. This relatively low explanatory power suggests that macroeconomic variables alone play a limited role in explaining digital bank stock price movements. Consequently, these findings support the view that firm-specific internal factors, such as profitability performance, innovation adoption rates, and customer engagement intensity, may exert a stronger influence on stock price fluctuations, helping explain the weak correlation observed between macroeconomic indicators and digital bank stock prices in this study.

This further supports the idea that internal variables such as digital bank profitability, innovation adoption rates, and customer engagement levels could significantly impact price fluctuations. These factors may explain the weak correlation found between macroeconomic indicators and stock prices in this study.

The t-test results, shown in Table 1.5, further clarify the relationships between the independent and dependent variables. The Federal Reserve interest rate exhibits a regression coefficient of -856.71 and a p-value of 0.310. This indicates a negative relationship: a 1% increase in the Federal Reserve interest rate is associated with a decrease in digital bank stock prices by IDR 856.71, holding other variables constant. However, the p-value, which is greater than 0.05, suggests this relationship is not statistically significant. Similarly, the Rupiah-to-US Dollar exchange rate shows a regression coefficient of -2.86, implying that a depreciation of the Rupiah by IDR 1 against the US Dollar tends to decrease digital bank stock prices by IDR 2.86. Nonetheless, the p-value of 0.821, which is much higher than 0.05, indicates that this effect is also not statistically significant.

Table 2. T-Test Results

Coefficients				
Variable	**Unstandardized Coefficients B**	**Standardized Coefficients Std. Error**	**t Beta**	**Sig.**
(Constant)	45,310.172	177,466.854		.801
Interest Rate	-856.712	820.784	-0.557	.310
Exchange Rate	-2.856	12.411	-0.123	.821

Note: Dependent Variable: Stock Price
Source: Data processed by researchers

Overall, while the analysis reveals theoretical relationships between macroeconomic variables and digital bank stock prices, the statistical insignificance of these findings underscores the need for further investigation, potentially incorporating additional factors better to explain stock price dynamics in the digital banking sector.

4.2 Discussion

The findings of this study provide nuanced insights into the relationship between macroeconomic variables, particularly the Federal Reserve's interest rates and the Rupiah-to-US Dollar

exchange rate, and the stock prices of digital banks in Indonesia. While previous literature underscores the significance of these variables in shaping market dynamics, this study's results show no statistical significance, suggesting that other factors may play a larger role in determining digital banks' stock prices.

One possible explanation is that digital banks, as relatively young and technology-intensive institutions, are more strongly influenced by firm-specific and sectoral factors than by external macroeconomic variables. Prior literature suggests that emerging and innovation-driven industries tend to exhibit valuation dynamics shaped by growth expectations, technological adoption, and competitive positioning, which may dilute the immediate impact of global monetary shocks on stock prices (Yang, 2017; Litsios, 2013). In addition, the limited sensitivity of digital bank stocks to global factors may reflect their lower exposure to foreign currency liabilities and international capital flows than traditional banks (Dominguez & Tesar, 2001; Reboredo et al., 2016).

Moreover, domestic conditions may exert a more dominant influence on digital bank stock performance. Evidence from emerging markets indicates that local monetary policy settings, inflation dynamics, and domestic investor behavior often play a more direct role in shaping financial asset prices than external macroeconomic developments (Kontonikas et al., 2013; IMF, 2023). Consequently, the weak relationship observed between global macroeconomic indicators and digital bank stock prices in this study underscores the importance of incorporating firm-level and industry-specific characteristics to explain better stock price fluctuations in Indonesia’s digital banking sector.

The regression analysis demonstrated a negative but statistically insignificant relationship between the Federal Reserve's interest rate and digital bank stock prices. Specifically, a 1% increase in the Federal Reserve's interest rate was associated with a decrease of IDR 856.71 in digital bank stock prices. This aligns with the theoretical framework outlined by Bernanke & Kuttner (2005), who emphasized the inverse relationship between interest rate hikes and stock market performance due to increased discount rates and reduced investment attractiveness. However, the statistical insignificance (p-value = 0.310) suggests that Indonesia's digital banking sector may be less sensitive to changes in global monetary policy than other sectors. This finding may reflect the nascent nature of the digital banking industry, which relies more on localized factors, such as technological innovation and customer acquisition strategies, than on global capital flows.

Moreover, the study's results align with Maio (2014), who noted that firms' sensitivity to interest rate changes varies with financial constraints and market conditions. Digital banks, characterized by high growth potential and reliance on equity financing, may exhibit less responsiveness to interest rate fluctuations. The findings also support the notion that during periods of economic stability, the

signaling effect of Federal Reserve policy changes may have a muted impact on emerging markets like Indonesia, as Kontonikas et al. (2013) suggest.

The regression analysis revealed a negative but statistically insignificant relationship between the Rupiah-to-US Dollar exchange rate and digital bank stock prices. A depreciation of the Rupiah by IDR 1 against the US Dollar was associated with a decrease in stock prices by IDR 2.86. While this finding aligns with the theoretical framework proposed by Dominguez & Tesar (2001), which highlights the impact of exchange rate fluctuations on firm performance, the lack of statistical significance (p-value = 0.821) suggests that exchange rate movements may not be a primary driver of stock price volatility in the digital banking sector.

Theoretical perspectives from Reboredo et al. (2016) further suggest that the impact of exchange rates on stock prices is context-dependent, with emerging markets exhibiting bidirectional risk spillovers. However, the limited exchange rate impact observed in this study may reflect digital banks' relatively low exposure to foreign-currency liabilities compared with traditional banks or export-oriented firms. Additionally, the findings align with Odionye et al. (2024), who noted that small exchange rate fluctuations often have minimal effects on stock prices, particularly in industries with strong domestic market orientation.

The results highlight the limited explanatory power of macroeconomic variables, as shown by the coefficient of determination (R^2) of 0.200. This suggests that approximately 80% of the variability in digital bank stock prices is attributable to factors not captured in the model. This finding underscores the importance of firm-specific and industry-specific factors, as Litsios (2013) emphasizes, in shaping stock price dynamics. For instance, variables such as technology adoption, regulatory changes, and competitive positioning may play a larger role in shaping investor sentiment and stock performance in the digital banking sector. The findings also suggest that investor behavior in the digital banking sector may be influenced by intangible factors, such as growth expectations and perceived market potential, which are less directly tied to macroeconomic conditions. This aligns with the theoretical proposition that emerging industries often exhibit unique valuation dynamics, as Yang (2017) highlights.

5. Conclusion and Suggestion

5.1 Conclusion

This study examined the relationship between two key macroeconomic variables—Federal Reserve interest rates and the Rupiah-to-US Dollar exchange rate—and the stock prices of digital banks listed on the Indonesia Stock Exchange (IDX) during 2021–2023. Despite theoretical underpinnings suggesting significant effects of these variables on stock prices, the findings revealed that both the Federal Reserve's interest rate and the exchange rate have negative but statistically insignificant

impacts on digital bank stock prices. Specifically, a 1% increase in interest rates was associated with a decrease of IDR 856.71 in stock prices. At the same time, a 1-IDR depreciation of the Rupiah corresponded to a decrease of IDR 2.86 in stock prices. However, neither relationship was statistically significant at the 5% level.

The limited explanatory power of the macroeconomic variables, with an R^2 of 0.200, suggests that other factors, such as firm-specific characteristics, sectoral developments, and investor sentiment, likely play a larger role in determining stock price movements in Indonesia's digital banking sector. These findings align with previous literature, suggesting that emerging and nascent industries often exhibit unique dynamics driven by growth expectations, technological innovation, and market-specific characteristics.

Further analysis indicates that digital banks in Indonesia may be influenced more by domestic regulatory changes, technological advancements, and consumer adoption rates rather than external macroeconomic shocks. Investor sentiment, particularly regarding fintech developments and digital banking services, may have a greater impact on stock prices. Additionally, venture capital investments, strategic partnerships, and sector expansion strategies may contribute to stock price fluctuations.

These results imply that relying solely on macroeconomic indicators may lead to incomplete or biased investment decisions, particularly in the digital banking sector, where firm-specific and industry-specific dynamics play a dominant role in shaping stock price movements. For investors, incorporating factors such as profitability trajectories, digital innovation capability, customer acquisition efficiency, and competitive positioning is essential to assess firm value and growth potential accurately. Digital banks operate in a rapidly evolving environment characterized by technological disruption and intense competition, making their valuations more sensitive to internal strategic execution than to broad macroeconomic fluctuations.

For policymakers, the findings highlight the importance of industry-aware regulatory and supervisory frameworks that recognize digital banks' unique risk profiles and growth drivers, rather than applying uniform macroprudential assessments. Accordingly, future research should further investigate alternative determinants, including digital transformation strategies, firm-level financial performance, and market competition, to provide a more comprehensive explanation of stock price behavior. In addition, integrating behavioral finance perspectives, such as investor overreaction and herding behavior, may offer valuable insights into the heightened volatility observed in this emerging sector. Moreover, considering behavioral finance aspects such as investor overreaction or herding behavior could also enrich the understanding of stock price volatility in this emerging sector.

5.2 Suggestion

Investors and market participants are advised to avoid over-reliance on macroeconomic indicators, such as interest rates and exchange rates, when assessing the performance of digital bank stocks. Instead, they should focus on firm-specific factors, including financial performance, technological advancements, and customer acquisition strategies, to make well-informed decisions. Diversifying investment portfolios is also recommended to mitigate risks associated with the unique dynamics of the digital banking sector. Policymakers and regulators should support the industry's growth by fostering a stable economic environment that minimizes vulnerabilities to external shocks, such as currency fluctuations and global interest rate hikes. Additionally, strengthening financial literacy and investor education initiatives can help market participants better understand the risks and opportunities in emerging industries such as digital banking. For future research, incorporating additional variables such as firm-level metrics, regulatory impacts, and consumer adoption rates could provide a more comprehensive understanding of stock price movements in the sector. Complementing these quantitative approaches with qualitative methods, such as investor sentiment analysis or case studies of individual digital banks, could also offer valuable insights. Expanding the study to include comparisons with traditional banks or digital banks in other countries may further clarify the sector's resilience and vulnerabilities.

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