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MACROECONOMIC FACTORS AND GOVERNMENT BOND YIELD IN INDONESIA

Abstract

The issuance of bonds by the government attracts the interest of many investors, including foreigners. The government must understand the factors determining bond yields for managing government debt. This study aims to investigate the effect of domestic and global macroeconomic variables on government bond yields in Indonesia. The paper uses monthly data from November 2014 to December 2022. The research sample comprises government bonds with 5, 10, and 15-year tenor bonds. The GARCH (1,1) and GARCH-M (1,1) models are applied to estimate and analyze the determinants of government bond yields. Research findings reveal that Indonesian interest rates significantly affect the yield of 10- and 15-year tenor bonds. Inflation has no impact on bond yields across all tenors. The increase in foreign exchange reserves reduces bond yields in all tenors. The Indonesian stock exchange index is detrimental to long-term bond yields. The exchange rate has a positive impact on bond yields in all tenors. World oil prices significantly impact yields on 5- and 10-year tenor bonds. The Fed's interest rate positively affects the yield on the 15-year tenor bond. The implication of these findings for the Indonesian government is the implementation of several aspects of economic and financial policies that can improve state debt management and financial market stability.

Keywords government debt management, financial market stability, interest rate, inflation

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INTRODUCTION

The COVID-19 pandemic that hit Indonesia in early 2020 has presented unprecedented economic challenges (Endri et al., 2021). To overcome the financial consequences, the Indonesian government launched the National Economic Recovery Strategy (PEN). This strategy includes various measures, including social support and incentives for micro, small, and medium enterprises (MSMEs) to maintain business continuity and accelerate economic recovery. However, implementing this strategy increased the state budget, which impacted the state revenue and expenditure budget (APBN) deficit. One source of government financing to cover the APBN deficit is by issuing bonds or debentures. Issuing debt securities is seen as one way to meet budget financing needs due to the budget deficit, which is increasing yearly. One form of state loan in the form of debt securities is called state securities (SBNs). SBNs consist of

a) state debt securities (SUN);
b) retail state bonds (ORI);
c) state treasury bills (SPN); and
d) state Sharia securities (SBSN) or Sukuk.

Government debt financing through the issuance of SBNs is increasing every year, which is directly proportional to the increase in the ratio of government debt position relative to gross domestic product (GDP).

An increase in government bond yields has significant consequences for the government's budget burden, especially in interest payments that must be paid yearly. Government bond yields are determined more by macroeconomic variables, including interest rates, budget deficits, stock markets, foreign exchange reserves, and world oil prices (Trinh et al., 2020). Rahmatika (2019) proves that foreign exchange reserves, world oil prices, inflation, exchange rates, and money supply influence government bond yields. H. Nguyen and P. Nguyen (2022) reveal the positive impact of the central government balance sheet and policy interest rates on 3-year and 5-year government bond returns, while the exchange rate and stock index have a negative effect. Inflation hurts the yield on 10-year government bonds. Poghosyan (2014) proves that the ratio of government debt to GDP significantly positively influences government bond returns in both the short and long term. Qisthina et al. (2022) demonstrate that bond prices negatively influence medium and long-term government bond yields. Interest rates positively affect long-term government bond returns, while exchange rates are for the medium term.

In general, previous research related to factors influencing government bond yields used the multiple linear regression method (Tjandrasa et al., 2020; Megananda et al., 2021; Koroleva & Kopeykin, 2022; Omodero & Alege, 2022; Grishunin et al., 2023). The basic assumption in multiple linear regression is that the residual values that appear in financial data have the same or homoscedastic variance; meanwhile, economic data are volatile (Wang, 2009). It is interesting to apply the GARCH (generalized autoregressive conditional heteroskedasticity) model as an analysis method, which has advantages compared to the multiple linear regression method in dealing with volatility in financial data. One of these advantages is that this model does not consider heteroscedasticity as a problem but instead takes advantage of this condition to create a model. A more efficient estimator will be obtained using heteroscedasticity in the correct errors. Kim et al. (2021) applied standard GARCH and developed asymmetric GARCH models, including the E-GARCH, T-GARCH, P-GARCH, Q-GARCH, and I-GARCH models, to estimate the volatility of bond yield spreads.

1. LITERATURE REVIEW AND HYPOTHESES

The term structure of interest rate (TSIR) is the theoretical basis for explaining the relationship between interest rates and bond maturity. This concept outlines that interest rates change based on the bond's maturity. Mishkin and Eakins (2019) state that the three main theories that explain this relationship are

(1) Expectation theory: This theory states that long-term bond interest rates will reflect the anticipated short-term average over the bond's term. This depends on the expected future profits.

(2) Market segmentation theory: This theory assumes that the bond market with unequal maturities is a separate segment. Specific supply and demand determine the interest rate of each bond without considering other bonds with different maturities.

(3) Liquidity premium theory and preferential habitat theory. This theory implies that long-term bond interest rates reflect short-term interest rates plus a liquidity premium or investors' specific preferences.

The arbitrage pricing theory (APT) allows for determining asset prices based on macroeconomic factors that influence asset returns. The theory emphasizes that asset returns can be determined through the direct relationship between expected returns and systematic factors influencing asset prices. In APT, the basic assumption is that there is an arbitrage opportunity if two assets with similar characteristics trade at different prices (Cho et al., 1986). APT differs from the capital asset pricing model (CAPM) because it recognizes that markets sometimes misprice securities.

Interest rates are the macroeconomic variable most important in determining government bond yields. Akram and Das (2019) and Naidu et al. (2016) found that short-term interest rates

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are the main factor in long-term government bond returns. Zhou and McMillan (2021) prove that short-term interest rates are the primary determinant of bond returns in the short and long term. Another finding by Zhou and McMillan (2021) shows that short-term interest rates are asymmetric with long-term bond yields. Trinh et al. (2020), Santosa (2021), Agusty and Marsoem (2021), Varirahartia and Marsoem (2022), and Koroleva and Kopeykin (2022) also prove that an increase in the benchmark interest rate can increase government bond yields.

Apart from interest rates, the inflation rate is also the main trigger factor for the increase in government bond yields (Pinho & Barradas, 2021). An increase in the inflation rate in an economy is usually accompanied by a tendency to increase interest rates, which has implications for bondholders to demand higher yields (Paul, 2018). Santosa (2021) proves that the inflation rate positively impacts bond yields. Tjandrasa (2017) found that the inflation rate positively impacted 10-year government bond yields. Zhou and McMillan (2022) prove the opposite: the inflation rate hurts bond returns in the long term.

The relationship between exchange rates and bond yields can be explained by the theory of revealed interest rate parity (UIRP). Accordingly, domestic interest rates are the sum of international interest rates and expected changes in currency exchange rates. Therefore, an increase in interest rates causes exchange rate depreciation and, by implication, bond yields increase. Pramana and Nachrowi (2016) prove that the exchange rate positively affects government bond yields. Santosa (2021) and Arshad et al. (2018) reveal that the exchange rate positively influences bond returns in the long term. In contrast, Kurniasih and Restika (2015) found that the exchange rate negatively affects returns in the long term. Zhou and McMillan (2022) also revealed that the nominal effective exchange rate negatively affects bond returns in the long term. Depreciation of the exchange rate can attract investors, especially foreigners, to enter the Indonesian capital market, resulting in an increase in bond prices and a decrease in yields (Kuzu, 2020; Tjandrasa et al., 2020; Rosanti & Sihombing, 2021).

Foreign exchange reserves are assets monetary authorities hold to fulfill financial obligations due to international transactions. The amount of foreign exchange reserves held by a country indicates global financial markets because it provides information about the legitimacy of monetary policy and its creditworthiness (Caplinska & Tvaronavičienė, 2020). Bonds are a credit instrument; the availability of foreign exchange reserves also determines the yield obtained by bondholders. Santosa (2021) and Utama and Agesy (2016) reveal that foreign exchange reserves negatively affect bond yields.

Financial instruments traded on the capital market have different risk and return characteristics. When stock prices experience high volatility due to increasing market uncertainty, investors tend to turn to bonds, especially those issued by the government. Alexopoulou et al. (2010) prove that stock prices have a negative impact on government bond yields. Lin et al. (2018) revealed a positive influence of stock returns on short-term bonds while having a negative effect on the long term. Endri et al. (2020) and Tjandrasa et al. (2020) also found the negative influence of stock prices on bond yields.

Morrison (2019) proves that oil prices determine bond yields. Rahmatika (2019), Trinh et al. (2020), and Banerjee (2021) discovered that an increase in world oil prices can increase bond yields. Santosa (2021) shows that oil prices significantly positively affect returns. Saenong et al. (2020) reveal that in the long term, crude oil prices do not have a symmetric or asymmetric effect on bond yields, but they have a symmetric and asymmetric impact in the short term. Nazlioglu et al. (2020) prove that oil prices determine bond prices in most oil-exporting countries and two large oil importers (India and China). Dai and Kang (2021) reveal a significant Granger causal relationship between oil prices and government bond yields. Kang et al. (2014) show that positive oil market-specific demand shocks cause a decline in real bond yields. Balcilar et al. (2020) determined that closing world oil prices amplifies the volatility of US bond yields.

The Federal Reserve's policy in setting interest rates was responded to by changes in bond yields (Piazzesi, 2005). Narayana and Lubis (2023) revealed that the Federal Reserve's interest rate sig-

nificantly affected government bond yields during the 2008 financial crisis and the COVID-19 pandemic. Rosanti and Sihombing (2021) and Cochrane and Piazzesi (2002) indicate that the Federal Reserve's interest rate increase positively impacts bond yields.

The literature review investigating the determinants of government bond yields provide conflicting empirical evidence and different variables.

This study aims to identify and determine factors that affect government bonds by involving domestic and global macroeconomic variables targeting developing country, namely Indonesia. The study analyzes the determining factors of Indonesian government bond (IGB) yields for 5, 10, and 15 years. Thus, in line with the conceptual model presented in Figure 1, the research hypotheses are as follows:

H_1: *The Bank Indonesia 7-Day Reverse Repo Rate (BI7DRR) positively affects the Indonesian government bond yields.*

H_2: *Inflation positively affects Indonesian government bond yields.*

H_3: *Foreign exchange reserves have a negative effect on Indonesian government bond yields.*

H_4: *Composite Stock Price Index has a negative effect on Indonesian government bond yields.*

H_5: *Exchange rate has a negative effect on the yield of Indonesian government bond yields.*

H_6: *World oil prices positively affect Indonesian government bond yields.*

H_7: *The federal funds rate positively affects Indonesian government bond yields.*

2. METHOD

The research population includes all government debt instruments (SUN) issued by the Indonesian government from November 2014 to December 2022, with 183 bond data. The research sample was selected using a purposive sampling technique based on specific criteria, which included SUN with tenors of 5, 10, and 15 years, benchmark series, denominated in Rupiah, with a fixed coupon, and traded during the period November 2014 to December 2022. With these criteria, the research sample consisted of 24 series. The independent variable consists of seven variables (Table 1).

Time series data often experience heteroscedasticity, where the error variance is not constant over time. The autoregressive conditional heteroscedasticity (ARCH) model introduces autoregressive functions to capture variations in variance over time. Initially employed in economics and finance, ARCH models were developed to address challenges related to the volatility of time series data. In this model, the residual variance comprises a constant component and a component that varies over time. Subsequently, Bollerslev (1987) presented the generalized autoregressive conditional heteroscedasticity (GARCH) model. This model represents an advancement of the ARCH model, offering a

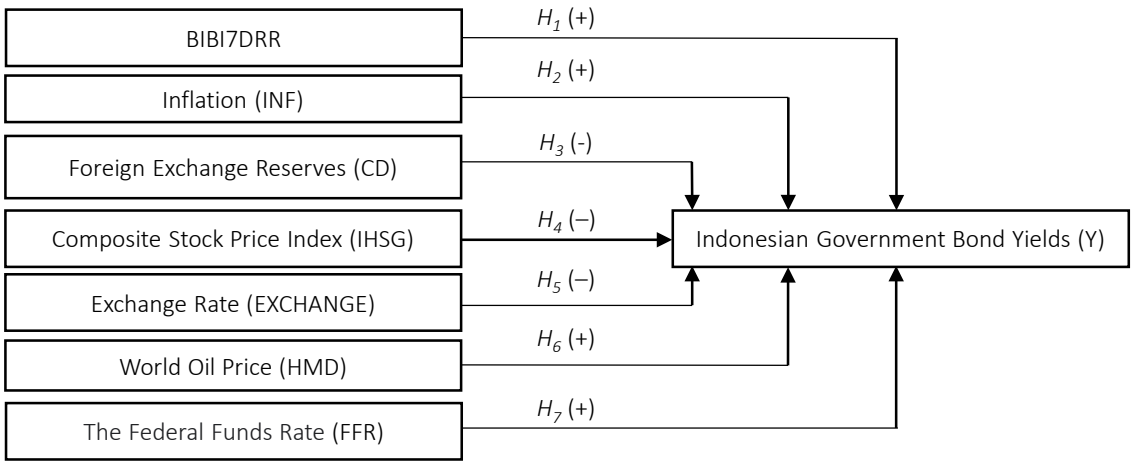

Figure 1. Conceptual model

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Table 1. Variable operationalization

No.	Variable	Label	Indicator	Data source	Scale
1	Government debt instruments (SUN) yield benchmark series five years	SUN5Y	Yield on SUN benchmark series with a tenor of 5 years at the end of the month	Direktorat Jenderal Pengelolaan Pembiayaan dan Risiko (DJPPR)	Ratio
2	Government debt instruments (SUN) yield benchmark series ten years	SUN10Y	Yield on SUN benchmark series with a tenor of 10 years at the end of the month	Direktorat Jenderal Pengelolaan Pembiayaan dan Risiko (DJPPR)	Ratio
3	Government debt instruments (SUN) yield benchmark series 15 years	SUN15Y	Yield on SUN benchmark series with a tenor of 15 years at the end of the month	Direktorat Jenderal Pengelolaan Pembiayaan dan Risiko (DJPPR)	Ratio
5	The Bank Indonesia 7-Day Reverse Repo Rate	BI7DRR	Percentage of the BI interest rate for the end of the month	Badan Pusat Statistik (BPS)	Ratio
3	Inflation	INF	Percentage of inflation for the end of month period	Bank Indonesia (BI)	Ratio
4	Foreign exchange reserves	CD	The level of foreign exchange reserves for the end of the month	Bank Indonesia (BI)	Ratio
5	Composite Stock Price Index	IHSG	IHSG end-of-month period	Investing	Ratio
6	Rupiah exchange rate	EXCHANGE	Rupiah exchange rate against USD for the end of the month	Investing	Ratio
7	World oil prices	HMD	WTI prices for the end of the month	Investing	Ratio
8	The federal funds rate	FFR	The Fed's interest rate for the end of the month	KataData	Ratio

more straightforward and economical approach. The GARCH model integrates three components for computing residual variance: a constant variance, variations from the preceding period, and the variance from the previous period. As a result, the GARCH model can manage volatility in time series data with fewer parameters than the ARCH model.

$$Y_t = \beta_0 + \beta_1 BI7DRR + \beta_2 INF + \beta_3 CD + \beta_4 IHSG + \beta_5 EXCHANGE + \beta_6 HMD + \beta_7 FFR + \varepsilon_t, \quad (1)$$

where Y_t – Bond yield government at time t; β_0 – Constant; β_1, β_2, β_3, β_4, β_5, β_6, β_7 – Coefficient regression; ε_t – Residual at time t.

For conditional variance σ_t^2:

$$\sigma_t^2 = \alpha_0 Y + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 \varepsilon_{t-2}^2 + \ldots + \alpha_p \varepsilon_{t-p}^2 + \lambda_1 \sigma_{t-1}^2 + \ldots + \lambda_q \sigma_{t-q}^2, \quad (2)$$

where σ_t^2 – Response variable (dependent) at time t or variance at time t; α_0 – Constant variance; $\alpha_1 \varepsilon_{t-1}^2$ – Previous period volatility (ARCH component); $\lambda_1 \sigma_{t-1}^2$ – Previous period variance (GARCH component).

The GARCH in Mean (GARCH-M) model amalgamates the volatility component (GARCH) with the mean aspect in the regression model. This model considers the impact of volatility on the mean or median value of the dependent variable. In the GARCH-M framework, the dependent variable is influenced by the independent variable, while volatility is affected by the residual and previous fluctuations. This framework enables the consideration of volatility's impact on the dependent variable's average.

The GARCH-M equation can be written as follows:

$$Y_t = \alpha + \beta X_t + \sigma_t \varepsilon_t, \quad (3)$$

$$\sigma_t^2 = \omega + \alpha\left(\varepsilon_{(t-1)}^2\right) + \beta\left(\sigma_{(t-1)}^2\right), \quad (4)$$

where Y_n = dependent variable at time t; X_t = independent variable at time t; α and β = regression coefficients that describe the relationship between variables dependent and independent; σ_t = volatility at time t; ε_t = remainder (residue) at time t; ω, α, and β = GARCH coefficients that describe the relationship between volatility at time t and previous times.

In the GARCH-M equation, the dependent variable is influenced by the independent variable ($\alpha + \beta X_t$), while volatility (σ_t) is influenced by the residual ($\varepsilon_{(t-1)}^2$) and previous volatility ($\sigma_{(t-1)}^2$).

3. RESULTS AND DISCUSSION

Based on Table 2, from November 2014 to December 2022, the mean yield for 5-year tenor SUN stood at 6.7%. Meanwhile, the average yield for a 10-year tenor SUN was recorded at 7.2%, and for the 15-year tenor SUN, it reached 7.5%. This observation aligns with the principle that bonds with longer maturities shows with higher returns. In contrast, when examining the standard deviation, which reflects the volatility of the bonds, it is evident that the 5-year SUN exhibits the highest volatility at 1%. The 10-year and 15-year tenor SUNs display lower standard deviations at 0.73% and 0.77%, respectively.

The study estimated the determinants of Indonesian government bond returns using the GARCH (1.1) and GARCH-M (1.1) models. Table 3 presents the Akaike Info Criterion (AIC) and Schwarz Criterion (SC) tests applied to determine the best GARCH (1.1) and GARCH-M (1.1) for the three bond tenors of 5, 10, and 15 years.

The best model for SUN5Y is GARCH (1,1) based on AIC and SC values, which are lower than the GARCH-M model (1,1). Based on the AIC and SC tests with the smallest values, the model chosen for the SUN10Y and SUN15Y variables is GARCH-M (1,1).

Table 2. Descriptive statistics

Variable	N	Mean	Median	Max.	Min.	Std. Dev.
SUN5Y	98	0.0671	0.0671	0.0964	0.0496	0.0102
SUN10Y	98	0.0724	0.0704	0.0964	0.0586	0.0073
SUN15Y	98	0.0750	0.0742	0.0985	0.0623	0.0077
BI7DRR	98	0.0512	0.0475	0.0775	0.0350	0.0136
INF	98	0.0115	0.0057	0.0595	−0.0045	0.0145
CD	98	124,359	125,426	146,870	100,240	11,770
IHSG	98	5,803	5,938	7,229	4,224	746.43
EXCHANGE	98	14,003	14,052	16,300	12,199	715.54
HMD	98	58,510	54,000	115,000	19,000	17,840
FFR	98	0.0109	0.0050	0.0445	0.0025	0.0097

Table 3. AIC and SC test results

Variable	GARCH (1,1)		GARCH-M (1,1)	
	AIC	S.C	AIC	S.C
SUN5Y	−8.498688	−8.208539	−8.471415	−8.154888
SUN10Y	−8.849860	−8.559711	−8.936822	−8.620295
SUN15Y	−8.645482	−8.355333	−8.675441	−8.358915

Table 4. GARCH model estimation results

Variable	Coefficient			Prob.		
	SUN5Y	SUN10Y	SUN15Y	SUN5Y	SUN10Y	SUN15Y
@SQRT(GARCH)	–	−0.091311	−7.49371	–	−1.592040	0.1114
C	0.762377	−0.104370	0.439429	0.0000	0.1716	0.0005
BI7DRR	0.053565	0.278009	0.109799	0.2160	0.0000	0.0141
INF	−0.036746	0.014100	0.045827	0.1016	0.5394	0.1780
CD	−0.111535	−0.044177	−0.048402	0.0000	0.0000	0.0000
IHSG	−0.000472	−0.008611	−0.022025	0.9380	0.4486	0.0041
EXCHANGE	0.063112	0.077442	0.040512	0.0000	0.0000	0.0000
HMD	0.003041	0.003992	0.000183	0.0318	0.0246	0.9298
FFR	0.010756	−0.002012	0.296019	0.7909	0.9661	0.0000
Conditional Variance						
C	2.32E−06	2.77E−06	1.92E−06	0.1463	0.1093	0.0533
RESID(-1)^2	1.058754	1.045841	0.600530	0.0142	0.0136	0.0547
GARCH(-1)	0.011839	−0.063157	0.308415	0.9474	0.3895	0.1331

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Model equations of GARCH (1.1) and GARCH-M (1.1) for IGB returns

$$SUN5Y = 0.76238 + 0.05357 \cdot BI7DRR - 0.03675 \cdot INF - 0.11154 \cdot CD - 0.00047 \cdot IHSG + 0.06311 \cdot EXCHANGE + 0.00304 \cdot HMD + 0.01076 \cdot FFR, \quad (5)$$

$$SUN10Y = -0.10437 + 0.27801 \cdot BI7DRR + 0.01410 \cdot INF - 0.04418 \cdot CD - 0.00861 \cdot IHSG + 0.07744 \cdot EXCHANGE + 0.00399 \cdot HMD - 0.00201 \cdot FFR - 0.09131 \cdot \sigma^2, \quad (6)$$

$$SUN15Y = 0.43943 + 0.10980 \cdot BI7 \cdot DRR + 0.04583 \cdot INF - 0.04840 \cdot CD - 0.02203 \cdot IHSG + 0.04051 \cdot EXCHANGE + 0.00018 \cdot HMD + 0.29602 \cdot FFR - 7.49371 \cdot \sigma^2. \quad (7)$$

Meanwhile, the equations for conditional variance are as follows:

$$SUN5Y \cdot \sigma_t^2 = 2.32 + 1.058\,\varepsilon_{t-1}^2 + 0.011\sigma_{t-1}^2, \quad (8)$$

$$SUN10Y \cdot \sigma_t^2 = 2.77 + 1.045\,\varepsilon_{t-1}^2 - 0.063\,\sigma_{t-1}^2, \quad (9)$$

$$SUN15Y \cdot \sigma_t^2 = 1.92 + 0.600\,\varepsilon_{t-1}^2 + 0.308\,\sigma_{t-1}^2. \quad (10)$$

Hypothesis testing of the three GARCH models using the t-test at a level of significance (α) of five percent is presented in Table 4. For Model 1 (SUN5Y), the variables from CD, EXCHANGE, and HMD significantly influence IGB because the probability value is smaller than α = 5 percent. The variables BI7DRR, CD, EXCHANGE, and HMD in model 2 (SUN10Y) significantly affect IGB. Finally, for model 3 (SUN15Y), the variables BI7DRR, CD, IHSG, EXCHANGE, and FFR have a significant effect on IGB.

The research results show that the BI interest rate does not significantly affect the yield of IGB with short tenors. This indicates that the government bond market with short tenors tends to be independent of monetary policy regulated by Bank Indonesia. The BI interest rate takes a certain amount of time to influence the bond market, so it does not significantly affect bond yields in the short term. These results support Rahmatika (2019). However, BI interest rates significantly positively affect medium and long tenors. This shows that Bank Indonesia's monetary policy influences bond yields with this tenor. The research findings state a positive relationship between short-term and long-term interest rates by the interest rate theory term structure. The increase in long-term bond yields is due to rising short-term interest rates. This happens because an increase in short-term interest rates can signal future interest rate increases, and to offset possible losses, investors expect higher yields on long-term bonds. These results are in line with Adiwibowo and Sihombing (2019), Qisthina et al. (2022), and Koroleva and Kopeykin (2022).

Inflation does not significantly affect government bond yields, whether short, medium, or long tenors. The IGB yield value, which tends to fluctuate during the research period, is not balanced by the inflation rate, which tends to stagnate at single digits. This shows that inflation runs its course and has no impact on changes in IGB yields. Suppose market players expect that monetary authorities can control the inflation rate. In that case, investors are more comfortable with a more stable IGB yield and are more focused on paying attention to changes in the benchmark interest rate. These results confirm Qisthina et al. (2022), Permanasari and Kurniasih (2021), Akram and Das (2019), Trinh et al. (2020), and Pratiwi and Mustafa (2021).

The results prove that foreign exchange reserves negatively affect IGB returns in all short-, medium-, and long-term tenors. Reserve divisions are essential for IGB investors related to the government's ability to fulfill its obligation to pay interest and principal on bonds. The significant increase in foreign exchange reserves is a potential alternative to financing the government budget and reducing bond issuance. This has an impact on reducing the IGB yield obtained by bond investors. Economic stability can minimize investment risk,

resulting in a positive boost to bond prices and lower yields. The results are in line with Claessens et al. (2007), Varirahartia and Marsoem (2022), and Wicaksono and Syarif (2022).

Composite Stock Price Index (IHSG) does not affect government bond yields with short and medium tenors. This result differs from findings by H. Nguyen and P. Nguyen (2022), who revealed a positive relationship between the stock market index and government bond yields. This study shows that the IHSG reflects the development of the stock market, which is determined by many factors, including financial performance and investor sentiment. At the same time, IGB returns are influenced by a country's macroeconomic variables, such as market interest rates and the level of foreign exchange reserves. With different driving factors, the short- and medium-term changes in the IHSG have no impact on bond yields. However, this paper reports that the IHSG significantly negatively affects long-tenor government bond yields. This result reflects the market perception that when the IHSG experiences a decline, investors tend to seek protection in safer financial instruments, such as government bonds with long tenors. This reflects an element of arbitrage, where investors shift funds from riskier (stocks) to safer (bonds) assets. As a result, demand for long-tenor bonds increases, which may decrease their yields. These results align with Tjandrasa et al. (2020).

The exchange rate significantly positively affects government bond yields in all tenors. Appreciation of the exchange rate of a currency, in this case, the Rupiah, can indicate that the currency is strengthening or becoming more valuable than other currencies (Dollar). The appreciation of the Rupiah exchange rate reflects the market perception that this currency has a higher risk of fluctuation. This may cause investors to demand higher yields to compensate for exchange rate risk. The results of this study confirm Gadanecz et al. (2018), Akram and Das (2019), and Agusty and Marsoem (2021).

World oil prices have a significant positive effect on government bond yields with short and medium tenors, where these results are in line with Adiwibowo and Sihombing (2019), Trinh et al. (2020), and Koroleva and Kopeykin (2022). Increasing world oil prices can increase inflation, especially in the short and medium term. This influences market expectations regarding bond yields. In the short and medium term, investors may demand higher yields to offset the risk of higher inflation, reflected in higher bond yields. However, long-term bonds are less sensitive to short-term fluctuations in world oil prices, as also proven by Morrison (2019) and Banerjee (2021).

The Fed's interest rate does not affect the yield of IGB with short and medium tenors. However, the Fed's interest rate significantly positively affects long-tenor government bond yields. The Indonesian government bond market has a high level of independence from changes in the Fed's interest rates in the short and medium term, while long-tenor bond yields are more responsive to these changes. These results align with Abrahams et al. (2016) and Rosanti and Sihombing (2021).

CONCLUSION

The study found that the Bank Indonesia interest rate significantly influences the yield of Indonesian government bond (IGB) with medium and long tenors. However, it does not significantly affect the yield of bonds with short tenors. Therefore, the government and monetary authorities may need to coordinate to manage interest rates carefully, primarily to support bond market stability. Inflation does not significantly affect IGB yields for short, medium, or long tenors. Foreign exchange reserves significantly negatively affect IGB yields in all tenors, indicating that increasing foreign exchange reserves is positive for the country's economic stability. Policies to maintain and increase foreign exchange reserves can be a priority to support the stability of the government bond market. Composite Stock Price Index does not significantly affect the yield of government bonds with short and medium tenors but has a significant adverse effect on the yield of government bonds with long tenors. The government can consider financial instruments or other strategies to protect its bond portfolio from the negative impact of the Composite Stock Price Index. This may include the use of financial derivatives or other hedging instruments.

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The Rupiah exchange rate positively and significantly affects Indonesian government bond yields in all tenors, indicating that an increase in the Rupiah exchange rate can affect bond yields. World oil prices positively and significantly affect the yield of Indonesian government bonds with short and medium tenors but do not affect substantially long tenors. Governments may need to evaluate energy and environmental policies in the context of dependence on world oil prices. The push to reduce reliance on fossil energy can positively affect economic and ecological resilience. The Fed interest rate does not affect the yield of Indonesian government bonds with short and medium tenors. However, it positively and significantly influences the yield of IGB with long tenors. The government needs to continue to monitor global economic conditions, especially the monetary policy announced by the Fed. This information can be used to anticipate changes in IGB yields and formulate appropriate policies.

This study has limitations regarding historical data, potentially restricting the analysis of long-term trends. Subsequent research endeavors may use more extensive historical data for a more thorough analysis. Furthermore, it is noteworthy that the bond market is subject to the influence of numerous other factors, whereas this study exclusively examines a limited set of variables. Encompassing additional macroeconomic factors could enhance the comprehension of the interplay between the variables under scrutiny and bond yields. Given the exclusive focus on Indonesian government bonds, the findings may not directly apply to bond markets in other nations with differing economic characteristics. Comparative studies involving other countries can offer a more comprehensive perspective on the determinants influencing bond markets. Subsequent research initiatives also contemplate utilizing alternative models beyond GARCH, such as EGARCH or TGARCH, to contribute supplementary insights to the analysis.

AUTHOR CONTRIBUTIONS

Conceptualization: Naning Fatmawatie, Endri Endri, Destyanah Husein.
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Formal analysis: Naning Fatmawatie, Endri Endri.
Funding acquisition: Naning Fatmawatie, Endri Endri.
Investigation: Naning Fatmawatie, Endri Endri.
Methodology: Naning Fatmawatie, Endri Endri, Destyanah Husein.
Project administration: Destyanah Husein.
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Software: Destyanah Husein.
Supervision: Endri Endri.
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