Article Type: Research Paper

Dynamics effect of volatility index, interest rates, and commodity prices on Indonesian bond yields

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Abstract: Several factors influence the movements and dynamics of bond yields in financial markets. The determination of monetary policy, specifically the decisions regarding interest rates made by central banks, is a critical factor. Moreover, bond yields can be influenced by various factors such as geopolitical events, financial volatility, market sentiment, and investor risk appetite. These factors can impact the demand and supply dynamics in bond markets. This research aims to analyze the influence of Interest Rates, IDR to USD Exchange Rates, Volatility Index (VIX), Gold and Oil Prices on Bond Yields in Indonesia. The data used in this research is secondary data, which consists of time series data from 2019-2023. This research investigates the impact of financial and commodity prices on bond yields in Indonesia by using the autoregressive distributed lag (ARDL) model to examine both the long-run correlation and short-run effect. Empirical results found that Interest Rate, Volatility Index (VIX), and Oil Prices have a significant positive influence. Meanwhile, the Gold Price variable has a significant negative influence. This research has several crucial policy implications for investors concerning the national monetary policy, exchange rate fluctuation, and global volatility index to create profitable and sustainable portfolio strategies. Moreover, investment managers and investors should be concerned about the global commodities prices that will affect bond yield performances. This research contributes to the recent literature presenting causal relations of global volatility index (VIX) on Indonesian bond yield.
Keywords: Interest Rates; IDR to USD Exchange Rate; Volatility Index; Gold Commodity Prices; Oil Commodity Prices; Bond Yields
JEL Classification: E43; F31; G12; G15; Q02; Q43

Introduction

Bonds serve as a compelling alternative investment option within diversified portfolios, offering investors a range of benefits distinct from traditional equity investments. One of the primary advantages of bonds as an alternative investment is their potential to generate stable and predictable income streams through periodic interest payments, known as coupon payments. Unlike equities, which offer returns primarily through capital appreciation, bonds provide fixed or floating interest payments, offering investors a reliable source of income regardless of market conditions. Investors who want to reduce risk tend to choose

bonds as an investment instrument in financial assets because of several advantages, such as lower volatility and providing positive returns with fixed income (Kurnianingsih, 2021).

Furthermore, bonds exhibit lower volatility compared to stocks, making them an attractive option for investors seeking to preserve capital and mitigate portfolio risk. The predictable cash flows and contractual obligations associated with bonds provide a level of certainty and stability that can help cushion against market downturns and economic uncertainties. Additionally, bonds often exhibit low correlations with equities and other asset classes, offering diversification benefits that can enhance portfolio resilience and risk-adjusted returns (Yunus, 2020).

Bonds serve various purposes for both issuers and investors. For governments, bonds are a crucial tool for financing public projects, infrastructure development, or budget deficits. Similarly, corporations issue bonds to fund expansion plans, research and development, or mergers and acquisitions. For investors, bonds offer a stable source of income through periodic interest payments, along with the assurance of repayment at maturity (Aini et al., 2023). Moreover, bonds are generally considered less risky than stocks, making them an essential component of diversified investment portfolios (Ibarra, 2013).

Bond yields in Indonesia reflect a confluence of domestic and global economic factors, market sentiment, and policy dynamics. Indonesian bond yields are influenced by monetary policy decisions of the central bank, Bank Indonesia, which aims to maintain price stability and support sustainable economic growth (Conterius et al., 2023). Changes in benchmark interest rates, such as the BI 7-Day Reverse Repo Rate, directly impact bond yields, as they affect borrowing costs and inflation expectations. Additionally, fiscal policies, government debt issuance, and budgetary developments play a crucial role in shaping bond market dynamics.

Moreover, Indonesian bond yields are sensitive to external factors, including global economic conditions, geopolitical events, and investor sentiment. Fluctuations in global interest rates, currency exchange rates, and commodity prices can spill over into Indonesian bond markets, affecting yields and investor confidence. Furthermore, credit ratings assigned by international rating agencies influence investor perceptions of sovereign credit risk, impacting demand for Indonesian bonds and yields. The development of Bond Yield in Indonesia during the 2019-2023 period shows fluctuations. The peak of the bond yield occurred in 2019, at 7,488. There was a decrease in 2020 to 6,937, which then decreased further in 2021 to 6,397, making that year the period with the lowest average bond yield in Indonesia in the 2019-2023 time frame. Furthermore, there was an increase in 2022 to 7,009. However, in 2023, there will be another decline to 6,610.

One element that significantly influences fluctuations in bond yields is the interest rate. Changes in interest rates have the potential to affect the value of bonds (Yuliawati & Suarjaya, 2017). Kurnianingsih (2021) states that interest rates are often the yardstick for investors in determining expected returns and as a basis for comparison in making investment decisions. Thus, the size of bond yields is highly dependent on changes in

interest rates set by Bank Indonesia. When interest rates rise, the yield received by investors tends to decrease on a relative basis. This happens because of the fixed nature of bond interest (fixed rate), so investors will demand compensation by asking for higher yields.

The BI Rate is Bank Indonesia's policy rate that influences monetary policy and the rupiah. An increase in the BI rate lowers bond prices and vice versa. Investors use interest rates as a reference in investment, and bond yields depend on the BI rate. The study from Susanti et al. (2022) states that the Interest Rate does not affect Bond Yield, this is due to the fact that the change in SBI interest rates used in this study, namely in the 2020-2022 range, increased not too high. Therefore, an increase or decrease in the SBI interest rate does not have a significant effect on bond yields.

Megananda et al. (2021) found that fluctuation in the exchange rate will cause a strengthening or weakening of a country's currency. A positive exchange rate will increase the company's value so that there is an increase in the price of securities such as bonds. This will affect bond yields because if the exchange rate increases, it will have a positive effect on bond prices, which will cause bond yields to increase. Furthermore, exchange rate movements influence investor perceptions of currency risk and creditworthiness, particularly for bonds denominated in foreign currencies. Investors may demand higher yields on foreign-currency bonds to compensate for exchange rate volatility and sovereign credit risk. As a result, fluctuations in exchange rates can impact the attractiveness of foreign-currency bonds relative to domestic-currency bonds, influencing capital flows and bond market dynamics (Basher & Sadorsky, 2016; Ciner et al., 2013; Pratiwik et al., 2023). Bonds are typically considered safer, more stable assets compared to equities, making them attractive during periods of market volatility and uncertainty. Consequently, when the volatility index rises, signalling increased market turbulence and risk aversion, investors often flock to bonds as safe-haven assets, driving up demand and bidding down bond yields. This flight-to-quality effect tends to lower bond yields during times of heightened volatility as investors seek refuge from volatile equity markets (Kang et al., 2019).

While bonds and the volatility index may exhibit a negative correlation during periods of extreme market volatility, the relationship between the two is not always straightforward. Factors such as interest rate movements, economic fundamentals, and geopolitical events can also influence bond yields independently of changes in the volatility index (Basher & Sadorsky, 2016). Thus, understanding the nuanced relationship between bonds and the volatility index is essential for investors and policymakers to navigate market fluctuations, manage risk exposures, and make informed investment decisions in an increasingly dynamic and uncertain financial landscape.

Gold, often considered a safe-haven asset, tends to exhibit an inverse relationship with bond yields due to their contrasting characteristics and roles in investment portfolios. When gold prices rise, indicating heightened investor concern or uncertainty, investors may flock to safe-haven assets like gold, leading to increased demand and upward pressure on gold prices (Vieira et al., 2023). Consequently, as demand for bonds

diminishes relative to gold, bond prices fall, and yields rise as investors demand higher returns to compensate for perceived risk (Basher & Sadorsky, 2016).

Conversely, when gold prices decline, signalling reduced investor anxiety or improved market sentiment, investors may rotate out of gold and into other assets, including bonds (Darsono et al., 2022). Increased demand for bonds can drive up bond prices and push yields lower as investors accept lower returns in exchange for perceived safety and stability (Agyei-Ampomah et al., 2014). This inverse relationship between gold prices and bond yields is particularly evident during periods of economic uncertainty, geopolitical tensions, or market volatility, where investors seek refuge in safe-haven assets like gold or government bonds to preserve capital and hedge against potential risks (Ciner et al., 2013).

Umar et al. (2023) indicate that rising oil prices can lead to higher inflation expectations, prompting central banks to tighten monetary policy by raising interest rates. In such cases, bond yields may increase as investors demand higher returns to compensate for the perceived increase in inflationary risk associated with higher oil prices. Conversely, when oil prices fall, inflation expectations may decrease, leading to lower bond yields as investors anticipate lower interest rates and reduced inflationary pressures (Mokni et al., 2022; Su et al., 2023).

Overall, the Indonesian bond market serves as a vital source of financing for both the public and private sectors, contributing to economic growth, infrastructure development, and capital market development. As Indonesia continues to strengthen its position as a major emerging market economy, the bond market is expected to play an increasingly important role in supporting investment, fostering financial stability, and diversifying investment opportunities for domestic and international investors(Suriani et al., 2018).

Hence, the objective of this research is to investigate the dynamic factors influencing bond yields in Indonesia. Bond yields play a crucial role in the country's financial markets, affecting borrowing costs for both the government and corporations, as well as influencing investor decisions and overall market sentiment. By analyzing various economic indicators, such as interest rates, volatility index, exchange rates of USD to IDR and commodity prices, this study aims to provide insights into the determinants of bond yields in Indonesia. Understanding these factors is essential for policymakers, investors, and market participants to make informed decisions, manage risk, and foster sustainable economic growth. Through empirical analysis and econometric modelling of the ARDL (Autoregressive Distributed Lag) Model, this research seeks to contribute to the existing body of knowledge on bond market dynamics and provide valuable implications for monetary policy formulation, investment strategy, and financial market development in Indonesia.

Research Method

The object used in this study is Bond Yield in Indonesia. This study discusses the dynamic influences of short-term and long-term relationships from variable Interest Rates, Exchange Rates, Global VIX, and Gold and Oil Commodity Prices in the period 2019-2023. This study used secondary data with a quantitative research type. This data is obtained in the form of numbers arranged sequentially from 2019-2023 and then analyzed using the Autoregressive Distributed Lag (ARDL) method.

We first apply the unit root tests to the applied time series before conducting the cointegration analysis in our analysis, including the most relevant unit root tests developed by ADF (Dickey & Fuller, 1979). The ADF test evaluates the null hypothesis that a time series variable contains a unit root, indicating non-stationarity, against the alternative hypothesis of stationarity. The test statistic compares the rate of decay of autocorrelations in the differenced series to that under the null hypothesis of a unit root. Suppose the test statistic falls below a critical value, typically determined from statistical tables or simulations. In that case, the null hypothesis of a unit root is rejected, suggesting that the series is stationary. Conversely, if the test statistic exceeds the critical value, the null hypothesis cannot be rejected, indicating the presence of a unit root and non-stationarity

After determining the unit root test, we use the cointegration tests using Bound test to check whether it is possible to construct a long-run equilibrium relationship between these variables being studied in our paper. The bound test for cointegration examines whether the estimated coefficients lie within certain critical bounds. These bounds are derived from statistical tables or simulations and depend on the number of variables in the model and the significance level chosen for the test. If the estimated coefficients fall within the critical bounds, the null hypothesis of no cointegration is rejected, indicating the presence of a long-term relationship among the variables (Bound & Leamer, 1983).

The Autoregressive Distributed Lag (ARDL) model will be used if no cointegration is identified by applying the preceding methods. We use this model in our study because it is superior regardless of whether the underlying regressors exhibit I(0), I(1), or a combination of both (Pesaran and Shin, 1998). The choice of a pooled regression enhances the number of observations (degrees of freedom), which are limited in macroeconomic studies due to the lower frequency of available observations. This improves the accuracy of estimation. The ARDL approach is used due to its flexibility in controlling variables with different degrees of integration. This research examines the dynamic connection between BI rates, exchange rates, volatility index, gold prices, and WTI oil prices on bond yield in Indonesia.

The long run model of the ARDL approach was formulated in the equation (1):

$$OBLR_t = \alpha + \sum_{l=1}^{p} \beta_0 OBLR_{t-1} + \sum_{l=1}^{q} \beta_1 BIR_{t-1} + \sum_{l=0}^{q} \beta_2 EXRATE_{t-1} + \sum_{l=0}^{q} \beta_3 VIX_{t-1} + \sum_{l=1}^{q} \beta_4 GOLD_{t-1}$$
$$+ \sum_{l=1}^{q} \beta_5 WOIL_{t-1} + \varepsilon_{it} \qquad (1)$$

Meanwhile, the equation (2) describes the short run model of ARDL:

$$\Delta OBLR_t = \alpha + \Phi_i(OBLR_{t-1} - \theta_1 BIR_{t-1} - \theta_2 EXRATE_{t-1} - \theta_3 VIX_{t-1} - \theta_4 GOLD_{t-1}$$
$$- \theta_5 WOIL_{t-1})$$
$$+ \sum_{l=1}^{p} \beta_0 OBLR_{t-1} + \sum_{l=1}^{q} \beta_1 BIR_{t-1} + \sum_{l=0}^{q} \beta_2 EXRATE_{t-1} + \sum_{l=0}^{q} \beta_3 VIX_{t-1}$$
$$+ \sum_{l=1}^{q} \beta_4 GOLD_{t-1} + \sum_{l=1}^{q} \beta_5 WOIL_{t-1} + \varepsilon_{it} \qquad (2)$$

Where t represents time, respectively, OBLR represents the Indonesian Bond yields, BIR denotes the Bank Indonesia interest rate, EXRATE denotes the currency exchange from USD to IDR, VIX denotes the global volatility index, GOLD represent the global prices of gold and WOIL represents the WTI oil prices. In notation, the short-run coefficients of the lagged dependent variable and other control variables are λ, λ', λ'', respectively; the long-run coefficients in our model are θ1 and θ2; and Φi is the speed of adjustment and ε represent the error term.

As we recognize that every variable has a different level of lag, the method used in this research is automatic regression distributed lag or ARDL, which can fulfil the need for different levels of lag for the model (Brahim et al., 2017). A root test is needed before using the method to satisfy its requirements.

Result and Discussion

Summary Statictics

Table 1 provides a comprehensive summary of variable statistics from 2019 to 2023. Statistics include Mean, standard deviation, minimum, median, and maximum values. The Mean score for BIR is 4,641. The standard deviation is 1.010. The maximum value of BIR is 6,000, and the minimum value is 3,500, indicating that Bank Indonesia's interest rate had a low exchange rate during the observation time.   The Mean value for EXRATE is 13495.78. The standard deviation is 3708.659. The maximum value of EXRATE is 16286, and the minimum value is 1407, illustrating that EXRATE has a low value during the observation time. The Mean score for the VIX is 21,691. The standard deviation is 7.956521. The maximum value of the VIX is 53,540, and the minimum value is 12,620., illustrating that the value of the VIX is lower. The Mean score for GOLD is 1756.867. The standard deviation is 208.3195. The maximum value of GOLD is 2071, and the minimum value is 1292, illustrating the low value of gold. Then, the Mean value for WOIL is 72.066.

The standard deviation is 21.353. The maximum value of VIXWOIL is 123, and the minimum value is 23, illustrating the low world gold price.

Tabel 1 Summary Statistics

Variable	Mean	Median	Max	Min	Std. Dev.
OBLR	6888.333	6874.500	8051	594	523.4516
BIR	4.641	4.500	6.000	3.500	1.010
EXRATE	13495.78	14352.50	16286	1407	3708.659
VIX	21.691	19.190	53.540	12.620	7.956521
GOLD	1756.867	1792.500	2071	1292	208.3195
WOIL	72.066	73	123	23	21.353

Classical Assumption

From the LM test results in Table 2, probability values are obtained. R-square of 7.658577 > alpha 5%, So it can be said that ECM model has no autocorrelation. The results of this Heteroscedasticity Test obtained prob values. Chi-Square (18) is 0.9988 > 5% alpha, meaning that this model does not contain heteroscedasticity in the long term.

Table 2 Classical Assumption

Autocorrelation Test			Heteroscedasticity Test		
Breusch-Godfrey Serial Correlation LM Test		Information	Heteroskedasticity Test: Breusch Pagan Godfrey		Information
F-statistic	2.772469	No Autocorrelation	F-statistic	0.840075	No Heteroscedasticity
Probability	0.0763		Probabilitas	0.6455	
Obs*R-Square	7.658577		Prob. Chi-Square	0.9988	

Unit Root Test

The first step in testing this study is to perform a stationary test using the root unit test. The Augmented Dickey-Fuller (ADF) method can be used in this testing process.

Table 3 Unit Root Test

Variable	Level	First Difference
OBLR	-2.848	-7.051***
BIR	-1.510	-3.190***
EXRATE	-6.494***	
VIX	-3.615***	
GOLD	-1.725	-8.251***
WOIL	-1.364	-6.552***

Note: *** denotes 1% significance levels

Table 3 shows that the probability of VIX and EXRATE variable values is lower than alpha 5%. In contrast, the probability of OBLR, BIR, GOLD, and WOIL variable values is greater than alpha 5%. Therefore, testing at the first difference level is needed to evaluate the stationary of the results.

Based on the Table 3, it can be seen that the ADF value for each variable is stationary after the first level of differentiation, and no variable has obtained a degree of freedom in the second level of differentiation. It indicates that interest rates, exchange rates, gold prices, and oil prices have a probability lower than 5% alpha.

Cointegration Test

A cointegration test is performed to assess whether there is a long-term relationship between the independent variable and the dependent variable. Given that the results of the stationary test show that the data are stationary at different levels, the Bounds Test method is used to test cointegration. Here are the results of the cointegration testing.

Table 4 Cointegration Test Results

F - Statistic	Critical Value α = 5%		Results
	I(0) Lower Bounds	I(1) Upper Bounds	
6.790	2.08	3	There is Cointegration

The results of the cointegration test using the Bound Test in Table 4 show that the F-static value is 6.790, which exceeds the limit of 3 (1). This implies cointegration between the variables of Interest Rate (BIR), Exchange Rate (EXRATE), Volatility Index (VIX), World Gold (GOLD) and Oil (WOIL) commodity prices against Bond Yields (OBLR) in the long-term period.
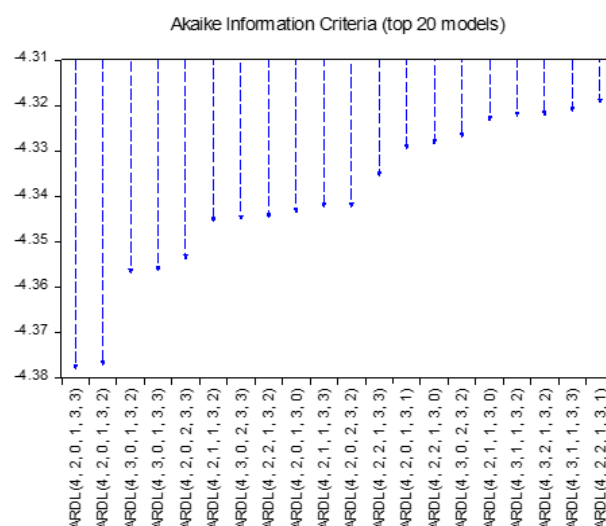
Determination of Optimal Lag

Figure 1 Result of Model Selection Test

In this study, the determination of lag length was used with the Akaike Information Criteria (AIC) method (Figure 1). The test results of the optimal lag length can be found in the figure. In the context of this study, the model that is leftmost and has the smallest AIC

value with optimal lag configuration on ARDL (4,2,0,1,3,3), was identified as the best choice for the ARDL method to be applied.

A short-term estimation test is a method used to evaluate the effect of an independent variable on the dependent variable over a short period, as well as to determine its significance. The results of this estimate are then described in the Table 5 below:

Table 5 Result of ARDL Estimation

Short-run			Long-run		
ARDL (4,2,0,1,3,3) Model based on AIC			ARDL (4,2,0,1,3,3) Model based on AIC		
Variable	Coefficient	Std.Error	Variable	Coefficient	Std.Error
DLOG(OBLR(-1))	0.314***	0.100	BIR	0.044***	0.009
DLOG(OBLR(-2))	0.127	0.110	LOG(EXRATE)	0.016	0.011
DLOG(OBLR(-3))	0.247***	0.083	VIX	0.008***	0.001
D(BIR)	0.135***	0.032	LOG(GOLD)	-0.483***	0.063
D(BIR(-1))	-0.119***	0.028	LOG(WOIL)	0.067**	0.031
D(VIX)	0.002***	0.000	C	-0.010	0.016
DLOG(GOLD)	-0.483***	0.076			
DLOG(GOLD(-1))	0.306***	0.089			
DLOG(GOLD(-2))	0.267**	0.098			
DLOG(WOIL)	0.015	0.027			
DLOG(WOIL(-1))	0.058**	0.025			
DLOG(WOIL(-2))	0.035	0.024			
ECT(-1)	-0.575	0.077			
R-squared 0.782					
Adjusted R-squared 0.722					

Note: ***,**,* denotes 1%, 5%, and 10% significance levels

The results of short-term estimation testing in Table 5 indicate that BI rate (BIR) variable had a positive and significant effect on bond yields in Indonesia in the short term. It can be seen from the coefficient value of 0.135882 at a significance level of 1%. VIX variables have a positive and significant effect on bond yields in Indonesia in the short term. This can be seen from the coefficient value of 0.002668 at 1% significance level. The GOLD variable has a negative and significant effect on bond yields in Indonesia in the short term with a coefficient value of -0.483819 at a significance level of 1%. The WOIL variable has a positive and significant effect on bond yields in Indonesia in the short term. This can be seen from the coefficient value of 0.058805 and the probability value of 0.0253 at a significance level of 5 %, respectively. The results of short-term estimation testing in Table 5 indicate that the value of ECT is -0.575882, with a probability value indicating 0.0000, illustrating the existence of short-term cointegration in the model. The validity of the ECT value is confirmed when the coefficient shows a significant negative value at the level of 1%. The higher the value of the coefficient (-1), the faster the adjustment process of the imbalance in the period.

Based on Table **5** above, the test results of long-term coefficient estimation found that BI Rates have a positive and significant effect on Bond Yield in Indonesia in the long term. This can be seen from the value of the coefficient 0.044534 at a significant level of 1%. Global Volatility Index (VIX) had a positive and significant effect on bond yields in

Indonesia in the long term. The value of the coefficient is 0.008840 at 1% level of significance. Gold prices had a negative and significant effect on Bond Yield in Indonesia in the long term. It can be seen from the value of the coefficient -0.483112, which shows a negative value at a significant level of 1%. WTI oil prices had a positive and significant effect on Bond Yield in Indonesia in the long term. This can be seen from the coefficient 0.067778, which shows a positive value at a significant level of 5%. The exchange rate variable does not significantly affect bond yields in the short term or the long term, based on empirical analysis showing that other factors such as monetary policy, fiscal stability, and domestic economic conditions play a more dominant role in determining bond yield levels.

Stability Test

This stability test is used to determine the stability of the estimation coefficient contained in the model. The estimation coefficient in the model is said to be stable if the graphs on CUSUM and CUSUM of Squares do not go out of the significance line at a 5% confidence level, indicating that the parameter is stable. The results of the CUSUM and CUSUMQ tests are shown in Figure **2** and Figure **3** as follows:
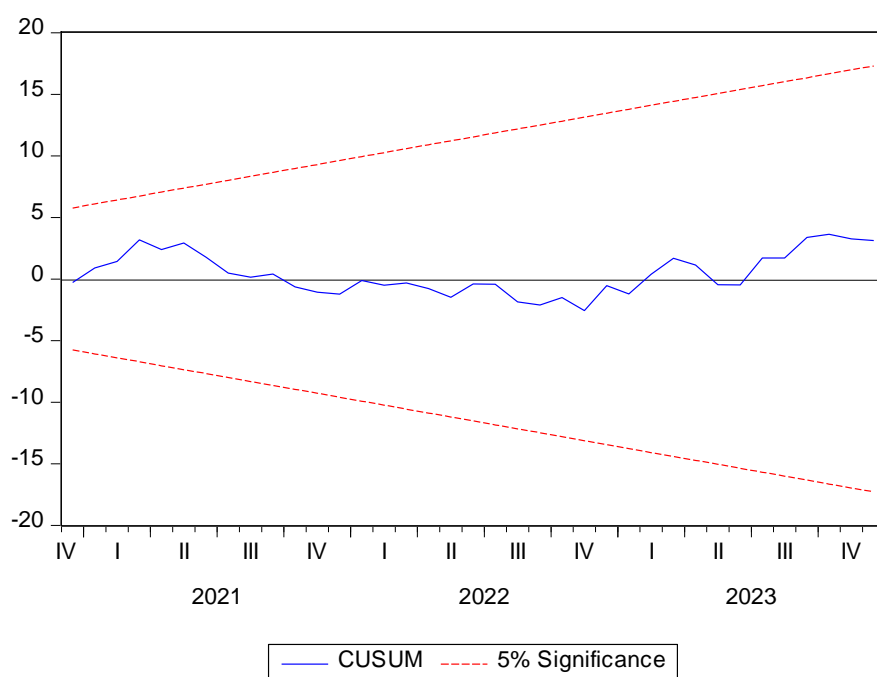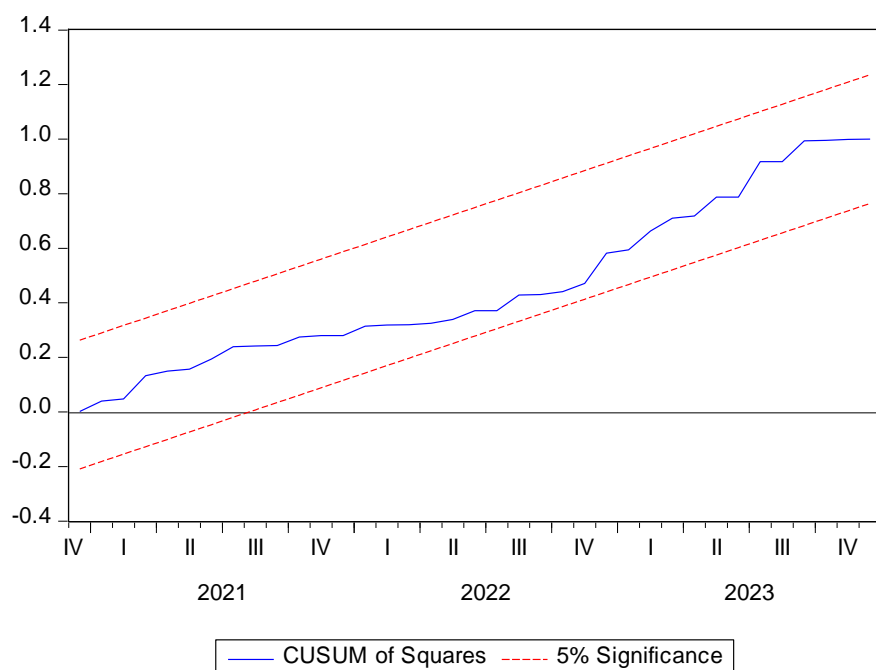

Figure 2 Cusum Test

Figure 3 Cusum of Squares Test

Based on Figures **2** and **3** above, it can be seen the results of the ARDL model stability test (4,2,0,1,3,3) conducted with the CUSUM Test and CUSUM of Squares show that the CUSUM and CUSUM of Squares graphs do not cross the 5% significance line limit (not out of the upper and lower limit lines) so that the model can be concluded in a stable state.

Discussion

The test results show that interest rates have a positive influence in the short term. That is, if the interest rate increases, bonds in Indonesia will increase. This is because the interest rate policy implemented by Bank Indonesia directly affects the bond market. When Bank Indonesia raises its benchmark interest rate to control inflation, it triggers a general increase in interest rates in the market. The results of this study are in line with the research conducted by Husein & Endri (2024), which says that Interest Rates positively affect bonds. In line with research by Kartika (2023) and Susanti et al. (2022) an increase in interest rates occurs under normal market conditions, bonds provide fixed interest payments to their holders. When general interest rates in the market rise, existing bonds with fixed interest payments become less attractive compared to newer bonds that offer higher interest rates. This is due to the fact that the interest earned on the bond under study is higher than the SBI interest rate, so investors pay more attention to the interest on the bond itself.

Index volatility has a positive influence in the short term. That is, if the volatility index increases, bonds in Indonesia increase. When there is high volatility, investors tend to seek safer investment instruments, such as bonds, leading to an increase in demand for Indonesian bonds. The results of this study are in line with the research conducted by

Mada (2019) and Basher & Sadorsky (2016) who found that the volatility index has a positive effect on bonds. In line with research conducted by Liu (2022) which says that the Volatility Index has a positive effect on bonds. This happens because in times of uncertainty or high volatility, central banks may be more inclined to keep interest rates at low levels or even lower them to relieve pressure in the market. This action can help keep bond prices stable.

Gold price has a significant negative influence in the short term, and the long term has a positive influence. That is, if the exchange rate increases, bonds in Indonesia will increase. Rising gold prices could also signal widespread concern or uncertainty in financial markets. This can affect overall perceptions in the market, making investors more cautious of risky investments such as bonds, and more likely to choose assets that are considered more stable, such as gold. The results of this study are in line with the research conducted by Megananda et al. (2021), Ciner et al. (2013) and Vieira et al. (2023) which concluded that the price of gold negatively affects bonds.

Oil prices have a positive influence in the short and long term. That is, if oil prices increase, then bonds increase in Indonesia. Rising oil prices often correlate with economic expansion, particularly for oil-exporting countries like Indonesia. Increased revenue from oil exports can stimulate economic growth, leading to higher corporate profits and government revenues. This positive economic environment can enhance the overall financial stability of the country, including its bond market, and increase investor confidence in Indonesian bonds. The results of this study are in line with the research conducted by Husein & Endri (2024) and Umar et al. (2023) which says that Interest Rates have a positive effect on bonds. In line with research by Azhgaliyeva et al. (2021), Mokni et al. (2022) and Su et al. (2023) found that rising oil prices are often associated with a rapidly growing economy. Stable economic growth can provide support for corporate and government financial performance, which can then increase investor confidence in bonds as a safe and secure investment option.

Conclusion

The aim of the research on the analysis of factors affecting bond yields in Indonesia for the period 2019-2023 using the ARDL method is to comprehensively understand the dynamics and determinants of bond yields in the Indonesian market over the specified timeframe. Through employing the ARDL approach, the study seeks to identify and analyze the long-run and short-run relationships between various factors, such as interest rates, market volatility, commodity prices, and exchange rates, and their impacts on bond yields.

This research contributes to providing valuable insights for investors, policymakers, and market participants to make informed decisions and formulate effective strategies in the Indonesian bond market. Firstly, Interest Rates in the short term and long term had a significant positive effect on bond yields. This indicates that fluctuations in interest rates consistently affect bond yields. Secondly, the global volatility index levels also have a

significant positive effect on bond yields in the short and long term. This suggests that market volatility plays a vital role in determining bond yields. Thirdly, the variable of gold prices, both in the short and long term, showed a significant adverse effect on bond yields in Indonesia. This implied that investing in gold may be an attractive alternative for investors when bond prices are high. Finally, oil prices, both in the short and long term, shown a significant positive effect on bond yields. This indicates that fluctuations in oil prices can be a factor influencing the bond market.

Based on our findings, this paper has several implications for policymakers, investment managers, and investors. Since the bond yields were negatively affected by gold prices, the increase in gold price level will result in lower returns in both the short run and long run. While investment managers and investors aim to get high profits and excess returns from their investments, they also care about the accompanied risk because high returns are always accompanied by high risks. In order to mitigate risks, investment managers must regularly monitor the global price of gold before providing recommendations or drawing conclusions about the attainment of Indonesian bonds. Furthermore, investment managers and investors must consider the BI Rates, Volatility Index and Exchange rates in order to make high returns. This research had several limitations, for instance, the period is limited to only five periods from 2019 to 2023. In addition, researchers only examined bond yields in Indonesia.

Author Contributions

Conceptualisation, S.N.A.C.D. and A.F.; Methodology, S.N.A.C.D.; Investigation, N.I. and P.N.; Analysis, S.N.A.C.D., and N.I.; Original draft preparation, S.N.A.C.D. and N.I.; Review and editing, S.N.A.C.D., and A.F.; Visualization, A.F. and P.N. All authors have read and agreed to the published version of the manuscript.

Acknowledgement

This research has been supported by Universitas Muhammadiyah Yogyakarta research grant for the period 2023/2024. The first authors would like to thank Wing-Keung Wong, Department of Finance, Asia University, Taiwan for his continuous guidance and encouragement.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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