

Determinants of Yield to Maturity of Indonesian Government Bond

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Abstract:- Indonesian rupiah-denominated government bond yields have risen by over the past few years, a relatively high level compared to some ASEAN member states and emerging markets (EMs).

The study aims to explore macroeconomic variables that can affect government bond yields. Indonesia so that the government's interest expense burden is kept at a reasonable and controlled level. This study uses multilinear regression analysis using SPSS.22 application. Based on domestic Indonesian government bond data traded on IDX for the period 2019-2020, using targeted sampling over a non-random sampling technique, 24 dat samples were selected. This study indicates that macroeconomic fundamental variables such as foreign reserves, composite index, BI interest rates, foreign ownership, and exchange rates affect the yield to maturity (YtM) movement of government bond. Meanwhile, other variables such as inflation, money supply, and industrial production index do not affect the YtM movement of Indonesia's government bond.

Keywords:- Indonesia's government bond; Yield to Maturity; Industrial Production Index; Inflation; Money Supply; Exchange Rates; Interest rates; Foreign Ownership; Foreign Reserves and Composite Index.

I. INTRODUCTION

Capital markets play an important role in the economic country's because the can perform two functions at the same time: financial and economic functions, but the Indonesian capital markets have various types of securities with opportunities. There are investors with you need to choose between these types of stocks, warehouse. One of a securities traded in the capital market is bond (Sihombing et al., 2018), i.e. debt confirmation letters issued by the Indonesian government or private companies to investors, which will be payment at a particular time, in the form of interest payment on loan. When economic crises hit Asia in 1997, Russia in 1998, and Argentina in 2000, domestic bond markets could provide an alternative means of meeting funding needs. Bonds have become an outlet and play an important role for most private and government institutions in meeting their financial needs (Sundoro, 2018).

Figure 1., shows that in recent years, the yield (yield) of Indonesian Government Bonds / Domestic Government Securities (SBN) denominated in 10 years Rupiah (SBN 10y) It is at a relatively high level compared to ASEAN-3 member countries and some emerging market countries (EM). This

relatively high yield will put pressure on government spending as the annual interest spending that the government must issue is heavily influenced by the size of Indonesia's government bond portfolio (Indarsih, 2013). Bond market conditions depend not only on macroeconomic fundamentals, not only market and external factors.

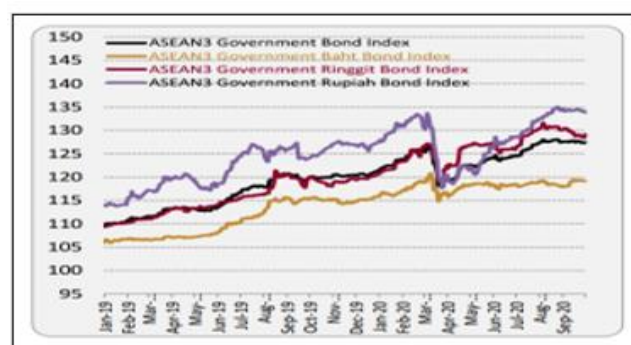


Fig 1. ASEAN 3 Government bond Index 2020

Source: Indonesian bond Market Directory 2020

With this in mind, we consider which variables may affect yields on domestic SBNs, particularly long-term Indonesian government bonds, and thus what recommendations can be made to minimize high yield risk. Need to investigate further. In order to keep the government's interest expense burden at a reasonable and controlled level, we need to make policy recommendations that can be made to lower the yield on Indonesian government bonds. Based on the identification of these issues, the researchers have taken the title of this study as Determinants of Yield to Maturity of Indonesian Government Bonds.

A study by some previous researchers and others found that inflation and BI interest rates had a positive impact on Indonesian government bond yields, exchange rate and foreign ownership had a negative impact on Indonesia's performance (Kurniasih & Restika, 2015). BI interest rates, inflation and foreign corporate interest rates are positive for Indonesian government bond yields. Economic growth, money supply and foreign exchange reserves will adversely affect Indonesian government bond yields (Sihombing & Sundoro, 2017).

Study another stated BI interest rate, inflation, composite stock indexes that have a positive impact on the yield of Indonesia's government bond, on the other hand exchange rate, money supply, industrial production indexes do not have a significant impact on the yield of Indonesian government bond (Sihombing et al., 2018). BI interest rates and foreign exchange reserves positive effect on the yield of

Indonesia's government bond. Where as an inflation, composite stock price index and money supply has a negative effect on the yield of Indonesian government bond (Sundoro, 2018). In previous studies also found that BI interest rate, inflation and exchange rate positive effect on the yield of Indonesian government bonds (Muktiyanto & Aulia, 2019).

This study uses the yield of Indonesian government bond with a tenor of ten years (10y) as a proxy for the yield of Indonesia's government bond in general, because it is the instrument most monitored by market participants and is a very important benchmark for many interest rates and reflects medium-term behavior, and longterm government bond (Fatmawati, 2020). Referring to the results of research by previous researchers, in this study the independent variables were selected, namely the exchange rate, BI interest rate, inflation, money supply, composite stock price index, ownership of foreign investors, industrial production index, and foreign exchange reserves.

II. LITERATURE REVIEW

Signaling Theory states that the owner of the information (company management) seeks to provide relevant pieces of information (financial statements) that can be utilized by external parties. Information Asymmetry Theory explains that information asymmetry affects investors' judgments and decisions to invest in a company. The more limited information investors get, the more risky they will invest in the company, causing them to protect themselves by providing a low price for the company (Akerlof, 1970).

A bond is a certificate or security with a contract between an investor as a funder and an issuer as a borrower (Tandelilin, 2017). A bond is a debt security issued by a government, a corporation, or other party to obtain funds and will repay all debt instruments issued on due date, with a rate of return over the life of the bond.

A bond yields is the yield received by investors adjusted between the coupon and the price received over the life of the bond, also known as the yield to maturity (YtM). YtM is most widely used as a measure of yield because it reflects the rate of return at compound interest that investors expect. Bond yields are a measure of the income an investor an investor earns from purchasing government bonds, which tends to vary because bond yields are closely tied to the return required by investors.

An exchange rate (also known as an exchange rate) is an agreement called the exchange rate of currency against current or future payments, between two currencies of per country or region. Falling exchange rate are accompanied by an increase in interest rates (Kurniasih & Restika, 2015). Positive Exchange Rate Impact on Indonesian Government Bond Yields (Muktiyanto & Aulia, 2019).

H1: Exchange rate has a positive effect of on yield to maturity of Indonesian government bonds.

Interest is the cost of borrowing or the price paid for an investment loan (Fatmawati, 2020). Interest is the amount of interest payable per unit of time, a percentage of the money the company issues from equity financing. As interest rates rise, government's bond prices fall because expected yields also increase, so has a positive effect during BI interest rates movement and yields of Indonesia's Government bonds (Kurniasih & Restika, 2015).

H2: BI interest rate has a positive effect on the yield to maturity of Indonesian government bonds.

Inflation is the continuous and gross rise in the prices of goods and services over a period of time, as measured by the consumer price index (Central Bureau of Statistics, 2020). If there is an increase in the inflation rate in an economy, then interest rates tend to increase in general (Sihombing & Sundoro, 2017). So if investors calculate an increase in inflation, then investors want a higher return on compensation. Inflation has a positive effect on Indonesian bond yields (Muktiyanto & Aulia, 2019).

H3: Inflation has a positive effect on the yield to maturity of Indonesian government bonds.

The Money supply is the total value of money in the community, which includes all term deposits and savings balances in rupiah, regardless of deposit size, but does not include term deposits, term and foreign currency savings balance at the commercial level bank (Bank Indonesia, 2020). An increase in money supply can expose bonds to risks, especially the risk of interest rate hikes, which can lead to an increase in bond prices, which in turn lowers yields (Rahmatika & Fachmi, 2020).

H4: Money supply has a negative effect on the yield to maturity of Indonesian government bonds.

The Composite Stock Price Index (CI) is an index that measures the performance of all stocks listed on the main chart as well as the IDX Development Chart (Indonesian Stock Exchange, 2020). CI, known as Indonesia Composite Index or IDX Composite (Sihombing et al., 2018). When the composite stock price index rises, indicating that the stock market is doing well, and investors prefer investing in the stock market than the bond market, bond yields also fall (Sundoro, 2018).

H5: The composite stock price index has a negative effect on the yield to maturity of Indonesian government bonds.

Increased ownership of foreign investors may encourage a reduction in the risk premium of different stocks within a country. The period when foreign investors enter the market can be a period of good market performance because foreign investors have high confidence in the economic development of the country. Significant increases in foreign ownership tend to reduce long-term yields on government bonds. The higher the expected return, the lower the price of bonds, leading to higher yields on bonds (Sihombing & Sundoro, 2017).

H6: Foreign ownership has a positive effect on the yield to maturity of Indonesian government bonds.

The industrial production index (IPI) is an economic indicator of monthly output that measures actual production, i.e. the level of production in the manufacturing, mining (including oil and gas drilling services) and electric and gas utilities sector), compared to the base year. Indonesia's industrial production index data is an estimate of economic growth released by the Central Statistics Office (BPS) (CEIC Data, 2020). However, the industrial production index did not affect yields on Indonesia's government bonds, where investors can buy government bonds when there is a signal of money supply or industrial production index. increases because it is possible that the price of government bonds will increase (Sihombing et al., 2018).

H7: The industrial production index has no effect on the Yield to Maturity of Indonesia's government bond.

Foreign exchange reserves are deposits in foreign currencies held at a monetary authority or Bank Indonesia, stored in a variety of currencies, which can be an important indicator of international trade and finance the growth of the economy. imbalance of payments, intervention to stabilize the exchange rate and maintain economic stability (Bank Indonesia, 2020). Negative impact of foreign exchange reserves on Indonesia's Government bond yield (Rahmatika,

2020). The larger a country's foreign exchange reserves, the lower its level of indebtedness, which leads to lower yields on that country's bonds (Akbari & Sentosa, 2019).

H8: Foreign exchange reserves of have a negative effect on the yield to maturity of Indonesian government bonds.

III. RESEARCH METHODS

The type of research used by the researcher is a causal study, i.e. a study that indicates the direction of the relationship between the independent variable and the dependent variable, in addition to measuring the strength of the relationship. This study examines and analyzes the effects of inflation, BI interest rate, exchange rate, money supply, composite stock price index, industrial growth index, foreign exchange reserves and foreign ownership for Indonesian government bond yields.

The models in this study are:

$$YtM = \alpha + \beta_1ER + \beta_2BRate + \beta_3CPI + \beta_4MS + \beta_5CI + \beta_6FO + \beta_7IPI + \beta_8FR + et$$

The measurement of variables can be seen in Table 1 as follows:

Table 1. Definition and Operationalization of Variables

No.	Variable	Definition	Unit of measure
1.	Yield to Maturity (YtM)	The return received by investors that adjusts between the coupon and the price received over the term of the bond	%
2.	Exchange Rate (ER)	Average exchange rate of rupiah against US dollar	Nominal Rp.
3.	BI Interest Rate (BRate)	The benchmark interest rate set by BI is called BI 7-Day (reverse) Repo Rate	%
4.	Inflation (CPI)	General and persistent price increases within a certain period of time	%
5.	Total Money Supply (MS)	The total value of money in the community is in rupiah	Billion Rp.
6.	Composite Stock Price Index (CI)	Stock index to measure the performance of all stocks on the IDX	Nominal Rp.
7.	Foreign Ownership (FO)	Ownership of bonds by foreign investors	%
8.	Industrial Production Index (IPI)	Economic indicators monthly which measures real output, i.e. the level of production in the industrial sector	%
9.	Foreign Exchange Reserves (FR)	Foreign money deposits held at the monetary authority (BI)	Million USD

Source: Results of secondary data processing.

The data in this study are the average yield of 10-year Indonesian government bonds, the population of a study data are all Indonesian government bonds traded on the Indonesian Stock Exchange during the period, 2019-2020, up to 43, bond data. While the identification of research samples is selected using hypothetical samples, is by identifying specific characteristics depending on the research goals achieved for the research question by researchers using research sampling criteria. It is one of the non-random sampling techniques to identify the sample: bonds issued before 10 years 2020 (10 year Indonesian government bonds) have maturity dates after 2020. Based on predetermined sampling criteria, the number of samples is 24 data samples.

In this study, using secondary data types that are quantitative, and the data for each variable is on a monthly scale (time series) for a years 2019-2020. The source of the data is obtained based on information published by relevant

institutions, such as Bank Indonesia, the Central Statistics Agency, the Indonesia Stock Exchange, the Indonesian Stock Price Appraiser, Directorate General of Financing and Risk Management, Ministry of Finance, CEIC Data, id.investing.com and finance.yahoo.com.

The data analysis method uses quantitative descriptive analysis, which is a quantitative research in which the description is numerical or numerical (statistical), which is related to the translation with statistical figures to explain the description of the variables to be studied in this study. Classical assumption testing is used before performing regression testing to test the hypothesis. The classical assumption testing used is multicollinearity, autocorrelation, heteroscedasticity and normality tests.

Multicollinearity test aims to check whether the regression model finds a correlation between the independent (independent) variables. A good regression model should have no correlation between the independent variables (Ghozali, 2017). The test for multicollinearity is performed using the tolerance value and the variance inflation factor (VIF), the cut-off value commonly used to indicate the presence of multicollinearity symptoms between the variables. multicollinearity independent variable is the tolerance value < 0.10 or same as the VIF value > 10 . Autocorrelation test is aimed to check if, in linear regression model, there is a correlation between residual error (residual) at period t and error at period $t-1$ (before) or not. Autocorrelation arises because consecutive observations over time are related. Using the Run Test method on a nonparametric test, if the result of the test value is not less than (not significant) 0.05, it means the null hypothesis is accepted, because It can be concluded that the residuals are random or that there is no autocorrelation between the residuals. The test of variance is intended to test whether in a regression model there is an unequal variance between the residuals of one observation and another. A good regression model is one with variable variance or no variable variance (Ghozali, 2017). If we were to display a scatterplot to show that the points in the image were randomly distributed and distributed both above and below zero on the y-axis, the distribution of data points would be unstructured and It does not form a ripple model that expands and then contracts. And unfolding again, we can conclude that the current regression model does not assume the variance of the variables. Normal testing can be performed using histogram analysis with parameters if the histogram shows a normal distribution, it will display the histogram according to the normal curve distribution (represented by the graph), bell curve and normal probability histogram with parameters if it shows a normally distributed pattern, then the data propagates around the diagonal and in the direction of the diagonal.

The estimation method uses multiple linear regression analyzes to test the influence of two or more independent variables on a dependent variable. To determine the magnitude of each regression coefficient, the standard beta coefficient is used, since the units of measure for the independent variables are not the same and can eliminate differences in the unit sizes of the variables. (Ghozali, 2017). Hypothesis testing is used including the goodness of fit test (F-test) to determine the influence of all independent variables simultaneously on the dependent variable and partial testing (t-test) to determine whether each independent variable individually affects the dependent variable. The results of the partial hypothesis test (t-test) and the magnitude of the significance value can be known by using SPSS software (Ghozali, 2017). Then the question arises about calculating the coefficient of determination (R^2) to measure how well the model is formed is capable of explaining the development of the dependent variable. The value of the coefficient of determination ranges from 0 to 1. The small value of R^2 means that the ability of the independent variables to explain changes in the dependent variable is very limited. A value close to one means that the independent variables provide almost all the information needed to predict

the development of the dependent variable. Most researchers recommend using the adjusted R^2 value when evaluating the best regression model. Unlike R^2 , the value of adjusted R^2 can be increased or decreased if an independent variable is added to the model (Ghozali, 2017).

IV. RESULTS AND DISCUSSION

➤ Descriptive Statistical Analysis

Table2. shows the yield to maturity (YtM) variable has a positive average value (mean). YtM has a mean value of 0.0721 (7.21%). During the study period the exchange rate (ER) of the rupiah against the US Dollar had an average value of Rp.14,344.43. The average Bank Indonesia interest rate (BI rate) is 4.94% for 2 years (24 months). Descriptive statistics show the average value (mean) of the inflation/consumer price index (CPI) data of 0.0253 (2.53%). The money supply (MS) shows an average value of Rp.1,000,772.67 billion. The composite stock price index (CI) for 2 years has an average value of Rp. 5,757.54. The large standard deviation of the CI indicates that the CI fluctuated greatly during the study period. Data on the percentage of ownership of foreign investors (FO) has an average value of 0.3544 (35.44%). Indonesia's industrial production index (IPI) data as a proxy for economic growth during the 2-year study period, has a fluctuating value with an average of -0.0357 (-3.57%). Foreign exchange reserves (FR) owned by the Indonesian government during 2019-2020 had an average value of USD.128,299.21 million.

Table 2. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Y_YtM	24	.0594	.0805	.072128	.0055926
ER_Nilai_Tukar	24	13732	15367	14344.10	419.984
Blrate_Suku_Bunga	24	.0375	.0600	.049375	.0081511
CPI_Inflasi	24	.0132	.0349	.025325	.0071040
MS_Jml_Uang_Beredar	24	928050	1047978	1000772.67	34551.778
CI_IHSG	24	4539	6533	5757.54	673.334
FO_Kepemilikan_Asing	24	.3147	.4089	.354424	.0253705
IPI_Indeks_Prod._Industri	24	-.2416	.0792	-.035715	.1036335
FR_Cadangan_Devisa	24	120075	137041	128299.21	5140.281
Valid N (listwise)	24				

Source: Results of data processing with SPSS.22

➤ Classic Assumption Test

The results of the multicollinearity test tolerance calculation in Table 3 show that there are no independent variables, but the tolerance is less than 0.10 and the VIF value calculation results also show that there are no independent variables with VIF values greater than 10 can be concluded to have no multicollinearity between the independent variables in the regression model.

Table 3. Multicollinearity Test Results

Coefficients ^a		Collinearity Statistics	
Model		Tolerance	VIF
1	Ln_ER_Nilai_Tukar	.258	3.870
	Blrate_Suku_Bunga	.105	9.486
	CPI_Inflasi	.154	6.504
	Ln_MS_Jml_Uang_Berdar	.232	4.302
	Ln_CI_IHSG	.128	7.800
	FO_Kepemilikan_Asing	.656	1.523
	IPI_Indeks_Prod._Industri	.130	7.684
	Ln_FR_Cadangan_Devisa	.123	8.105

a. Dependent Variable: Y_YtM

Source: Results of data processing with SPSS.22

Table 4. Autocorrelation Test Results with Runs Test

Runs Test	
	Unstandardized Residual
Test Value ^a	.00022
Cases < Test Value	12
Cases ≥ Test Value	12
Total Cases	24
Number of Runs	13
Z	.000
Asymp. Sig. (2-tailed)	1.000

a. Median

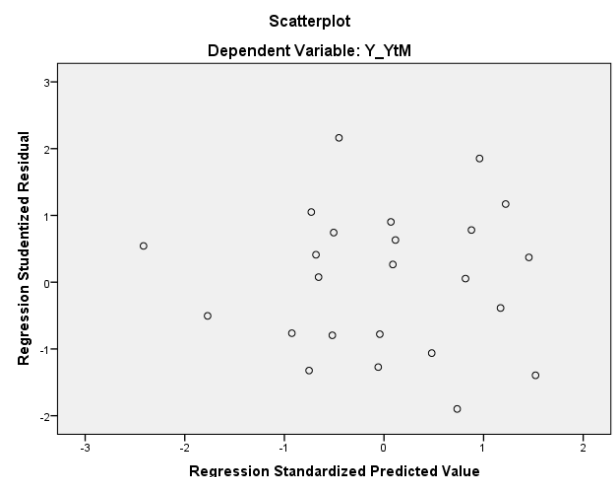
Source: Results of data processing with SPSS.22

The results of autocorrelation test using the Run test method in Table 4 show that the test value is not less than (not significant) 0.05, a namely an Asymp value. Sig. (two-Tailed) of 1000, which means the null hypothesis is accepted, so we can conclude that the residuals are random or there is no autocorrelation between the residuals.

➤ Heteroscedasticity Test

The results of the variance test with the scatter plot in Table 5. show that the points in the image are randomly distributed and distributed both above and below zero on the Y-axis, the distribution of data points is unstructured and unformed. The ripple pattern expands, then contracts, and then expands again. From this we can conclude that the current regression model makes no assumptions about the variance of the variables.

Table 5. Heteroscedasticity Test Results with graphs scatterplot



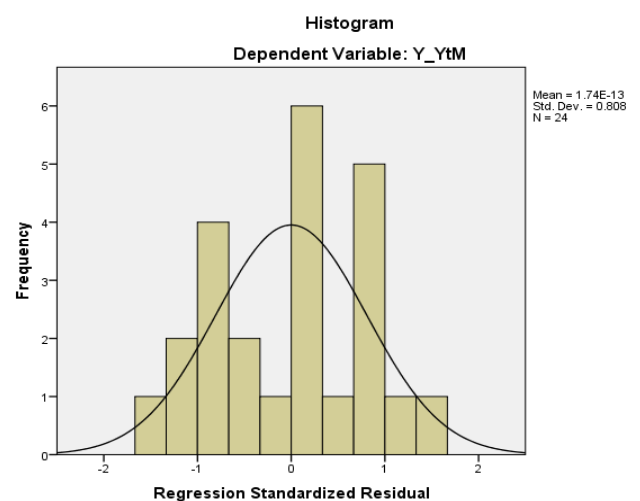
Source: Results of data processing with SPSS.22

➤ Normality test

Normality test are performed using conventional histogram and probability graph analysis.

1) Normality test (histogram chart).

Table 6. Normality test results with histogram graph

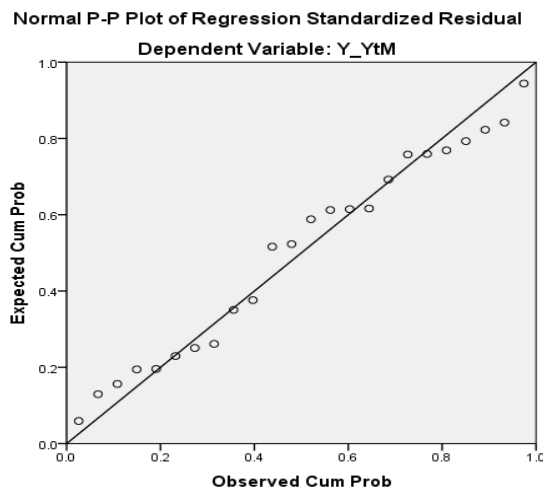


Source: Results of data processing with SPSS.22

The histogram in Table 6. show normal distribution, histogram is displayed according to the distribution of the normal curve (represented by the bell curve).

2) Normality test (normal probability plot).

Table 7. Normality Test Results with graphs normal probability plot



Source: Results of data processing with SPSS.22

The results of the normality test can see in Table 7. The normal probability plot shows a normally distributed pattern, the data then propagates around and in the direction of the diagonal.

➤ Multiple Linear Regression Analysis

In this analysis, all the independent variables will be estimated against the dependent variable using the application of SPSS.22 with multiple linear regression method. To determine the magnitude of each regression coefficient, standardized beta coefficients are used, because the units of measure for the independent variables are not the same. If the size of the independent variables are not the same, then it is better if the regression equation is interpreted using standardized beta. The advantage of using a standardized beta is that you can eliminate differences in the units of measurement of variables (Ghozali, 2017). In general, based on the results of data processing using the SPSS application, a linear regression equation model can be written as:

$$YtM = 0.551 + 0.353LnER + 0.653BIrate + 0.162CPI - 0.157LnMS - 0.311LnCI + 0.157FO + 0.011IPI - 0.424LnFR + 0.492$$

The linear regression equation can be described as follows:

- 1) If the other variables are constant, then the YtM value will change automatically by the constant value, namely 0.551;
- 2) If other variables are constant, then the YtM value will change by: 0.353 for every one unit of exchange value (ER); 0.653 per unit of BI interest rate (BIrate); 0.162 per unit of Inflation (CPI); -0.157 per unit of money supply (MS); -0.311 per unit of the combined stock price index (CI); 0.157 per unit of Ownership of foreign investors (FO); 0.011 per unit of Industrial Production Index (IPI); -0.424 per one unit of foreign exchange reserves (FR).

➤ Hypothesis test

Simultaneous test/goodness of fit (F-test) to determine the influence of all independent variables on the dependent variable.

Table 8. Test results Simultaneous testing (F test)

ANOVA ^a					
Model		Sum of Squares	df	Mean Square	F
1	Regression	.001	8	.000	34.911
	Residual	.000	15	.000	
	Total	.001	23		
					Sig.
					.000 ^b

a. Dependent Variable: Y_YtM

b. Predictors: (Constant), Ln_FR_Cadangan_Devisa, Ln_ER_Nilai_Tukar, FO_Kepemilikan_Asing, Ln_MS_Jml_Uang_Beredar, Ln_CI_IHSG, CPI_Inflasi, IPI_Indeks_Prod_Industri, BIrate_Suku_Bunga

Source: Results of data processing with SPSS.22

The F-test results in Table 8 show probability values, less than 0.05 (or 0.01) and, showing that the model turns out to be a good fit, it can be concluded that all the independent variables with each other have significant influence on the dependent variable. (YtM). Therefore, the formula of the hypothesis H1: $\neq 0$ can be verified, that is, there is a simultaneous significant effect of the independent variable on the dependent variable.

A partial test (t-test) is used to determine the effect of each individual independent variable on the dependent variable.

Table 9. Partial test results (t test)

Coefficients					
Model		Unstdzed Coefficients		Stdzed. Coeff.	t
		B	Std. Error	Beta	
1	(Constant)	.551	.492		1.122
	Ln_ER_Exchange_Value	.068	.022	.353	3.075
	BIrate_Tribe_Interest	.408	.112	.653	3.640
	CPI_Inflation	.128	.117	.162	1.091
	Ln_MS_Amount_Money_Circuit	-.025	.019	-.157	-1.302
	Ln_CI_IHSG	-.014	.008	-.311	-1.911
	FO_Foreign_Ownership	.035	.016	.157	2.180
	IPI_Index_Prod_Industry	.001	.009	.011	.071
	Ln_FR_Reserves_Foreign Exchange	-.059	.023	-.424	-2.554
					.022

a. Dependent Variable: Y_YtM

Source: Results of data processing with SPSS.22

Based on the t test results in Table 9, it can be described that the independent variables ER, BIRate and FO have t count > t table (2.13145), the independent variables FR and CI have t count > t table (1.7305). The independent variables CPI and IPI have t count < t table (2.13145), while the independent variable MS has a table value t count < t table (1.7305), for t count it is positive using the two tailed test while for t count it is negative using a one-tailed test. Negative sign is the direction of influence, negative means negative influence or vice versa, positive sign means influence is also positive so take absolute value of t count or absolute value, so t count > t table and significance < 0.05.

Table 10. Coefficient of Determination of R Square (R2) with Adjusted R2

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.974 ^a	.949	.922	.0015635

Source: Results of data processing with SPSS.22

In Table 10., the coefficient of determination is expressed as the value of the adjusted R-squared (R2), where in this test a value of 0.922 (92.2%) means that the variable YtM can be explained by a group of independent variables ER, BIRate, CPI, JUB, CI, FO, IPI and FR (simultaneously) is 92.2% while the rest (100% - 92.2% = 7.8) % is explained by other variables outside the model that have not been studied.

Based on the test results described in the previous description, the following discussion can be carried out:

➤ *Exchange rate against yield to maturity*

The exchange rate reflects investors' views on the direction of the future movement of the rupiah exchange rate and shows their perception of the risk of default on their investments in Indonesia..Movements that occur in the exchange rate of the rupiah against the USD (exchange rate) have a positive effect on the YtM of government bond statistically. So it can be concluded that hypothesis 1 in this study H1: exchange rate positive effect on yield to maturity of Indonesian government bond accepted and H0 rejected. The test results show results that are in line with previous studies,exchange rate positive effect on the yield of Indonesian government bond (Muktiyanto & Aulia, 2019)and The weakening of the exchange rate (has a positive relationship), in line with the increasing yield of Indonesian government bond (Rahmatika, 2020).

➤ *BI interest rate against yield to maturity*

BI interest rates can have a positive impact on the movement of bond yields, where an increase in BI interest rates can cause bond yields to also increase. Based on the test results, that when the interest rate is rising, the price of government bond will go down or it can be said that the yield is also rising. So it can be concluded that hypothesis 2 in this study H1: BI interest rate has a positive effect on yield to maturity of Indonesian government bonds accepted and H0 rejected. This is in line with the results of previous studies

that BI interest rate positive effect on the YtM of Indonesian government bond (Kurniasih & Restika, 2015) and (Sihombing et al., 2018).

➤ *Inflation against yield to maturity*

The results of the tests that have been carried out do not show the effect of inflation on YtM. The results of this study do not support the theory and previous research regarding the relationship between inflation and bond yields. Where every time there is an increase in inflation, it does not directly cause an increase in bond yields in Indonesia. Changes in inflation in the 2019-2020 period were quite volatile, but the bond yields offered were not much different. So it can be concluded that hypothesis 3 in this study H0 is accepted and H1: inflation positive effect on yield to maturity of Indonesian government bond rejected. This is possible because the monetary policy variables inflation and interest rates are negatively correlated with government bond yields. In Irving Fisher's theory, inflation has no indirect effect because it does not affect interest rates in the long run.

Impact on the price of government bonds. So while inflation is trending upwards, the government is telling market participants that economic conditions in Indonesia are still very good, that Indonesia's position is still an option, and that the yields offered are very high. Convinces you that it is the best investment option among other emerging markets given its high price. There is no underlying reason for the market to perceive this as it is competitive and potential's return has declined due to low inflation. Shows negative movement. The results of this study are in line with previous research that inflation has no effect on the YtM of Indonesian government bond (Fatmawati, 2020),

➤ *The money supply against yield to maturity*

An increase in the money supply can pose risks to bond, especially the risk of rising interest rates, which will increase expectations bond yields. From the results of this partial test, it is found that the money supply has no effect on the yield of Indonesian government bond, which means that an increase or decrease in the money supply will not cause the yield of Indonesian bond to increase or decrease. So it can be concluded that hypothesis 4 in this study H0 is accepted and H1: the money supply has a negative effect on yield to maturity of Indonesian government bond rejected. The results of this study are not in line with the results of previous studies that an increase in the money supply causes bond prices to increase which in the end yields will decrease, so that the amount of money in circulation negative effect on the yield of Indonesian government bond (Rahmatika & Fachmi, 2020). However, the results of this study are in line with previous researchby (Sihombing et al., 2018) and (Akbari & Sentosa, 2019) which states that the money supply is not affect the yield of Indonesian government bond.

➤ *Composite a stock price index against yield to maturity*

Stocks are inherently higher risk than bond, even though they promise higher returns. An increase in a demand for stocks causes a decrease in a demand and the price of bond, so that bond yields increased. This increased yield is a short term result, if in the long term, investors expect the stock

market to normalize, the yield spread will fall on the opposite side. Movement CI negatively affected the yield of short-term and long-term government bond. So it can be concluded that hypothesis 5 in this study H1: composite stock price index negative effect on yield to maturity of Indonesian government bonds accepted and H0 rejected. This is in line with previous research, that the CI negatively affected the yield of Indonesian government bond. When IC increases, it shows that the stock market is doing well and investors prefer to invest in the stock market rather than the bond market, the yield on bonds also decreases (Sundoro, 2018).

➤ *Ownership of foreign investors against yield to maturity*

An increase in foreign investment will make bond prices fall because it will increase the risk of default. The test results can illustrate that the higher the expected profit rate, the lower the bond price will result in the bond yield going up. So it can be concluded that hypothesis 6 in this study H1: Ownership of foreign investors has a positive effect on yield to maturity of Indonesia's government bond accepted and H0 rejected. In the period when more and more foreign investors invest in government bond, this makes the expectations of investors' profits to increase which results in an increase in yields, this is in line with the results of previous research conducted by (Sihombing & Sundoro, 2017).

➤ *Industrial production index against yield to maturity*

Industrial production index (IPI) data is a proxy for Indonesia's economic growth, but based on the test results show that industrial production index does not affect the yield of Indonesian government bond. So it can be concluded that hypothesis 7 in this study H1: industrial production index has no effect on the yield to maturity of Indonesian government bonds accepted and H0 rejected. The results of this test are in line with the results of previous studies which found that industrial production index does not affect the yield of Indonesian government bond (Sihombing et al., 2018). Investors can buy government bond when there is a signal that the money supply or industrial production index is growing because there is a possibility that the price of government bond will rise.

➤ *Foreign exchange reserves against yield to maturity*

When foreign exchange reserves increase, the yield of Indonesian government bond decreases. So it can be concluded that hypothesis 8 in this study H1: foreign exchange reserves negative effect on yield to maturity of Indonesian government bonds accepted and H0 rejected. A country's debt repayment capacity is reflected in the country's large foreign exchange reserves and also acts as a brake on external shocks. Found that foreign exchange reserves have a negative impact on bond yields country's Government of Indonesia, which is consistent with the research results by (Akbari & Sentosa, 2019) and (Rahmatika, 2020), that the larger a country's foreign exchange reserves, the lower the level of indebtedness, which reduces foreign returns country-linked exchange.

V. CONCLUSIONS AND RECOMMENDATIONS

➤ *Conclusion*

Based on the description of the discussion on the results of data processing, it can be concluded that exchange rate, BI interest rate, ownership of foreign investors has a positive effect on yield to maturity of Indonesian government bond, and CI, foreign exchange reserves negative effect on yield to maturity of Indonesian government bond, while inflation, the money supply, the industrial production index is not affect yield to maturity of Indonesia's government bonds.

➤ *Recommendations*

Parties related to government bond must pay attention to the fiscal and monetary policies implemented by the Indonesian government. These policies can cause changes in Indonesia's macroeconomic fundamentals which in turn will affect the YtM of bond. For further research, it can be used as a reference or basis for expanding research related to Indonesian government bond yields, by adding other research variables such as maturity and bond ratings as well as increasing the research period in order to better understand, the comparison of yield movements in the long-term period of more long time.

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