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ANALYSIS OF MACROECONOMIC EFFECTS ON THE YIELD OF CORPORATE BONDS IN INDONESIA

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Abstract: This study aims to examine and obtain empirical evidence of the effects of inflation, BI rate, exchange rate, foreign exchange reserves and the oil price to yield corporate bonds in Indonesia. An increase in the number of issuers and corporate bond issuance value in Indonesia means that many companies are using and seek financing through the issuance of bonds. Several studies have been conducted, inconsistencies results of research on factors affecting yield corporate bonds in Indonesia. This study uses a quantitative approach to the type of associative causal research. Measurement of variables in this study using a time series analysis were processed using Eviews program 10. This research was conducted using monthly data within the period of 2015 to 2018. The results of this research that inflation positively affects yield corporate bonds. BI rate has a positive effect on the yield of corporate bonds. Exchange rate positive effect on the yield of corporate bonds. Foreign exchange reserves negatively affect yield corporate bonds. Oil price positive effect on the yield of corporate bonds.

Keywords: yield, macro economic, VAR

INTRODUCTION

One of the company's policy to get the funds without having to owe to banks and issuing new shares are issued bonds. Bonds are debt instruments by parties who have a legal terms of

the law to issue bonds (corporate, government, state governments, foreign governments and foreign companies) to investors or buyers of bonds to be repaid in the future will be determined and for the duration of the loan investors will given the yield of interest that have been defined by the issuer (Fahmi, 2012).

Based on data from the Indonesia Stock Exchange (BEI) there is an increase in the number of issuers and bond issuance value of the year 2015-2018. This indicates that companies that use and seek financing through corporate bonds in Indonesia has increased. Bond trading activity related to yield bonds. According Tandelilin (2001), that the bond yield is an important factor for consideration of investors in the purchase of bonds as investment instruments. Bond yield is a measure of revenue bonds to be received by investors, who tend to be precarious. Corporate bonds are bonds with low trading levels or in other words an illiquid bonds, in contrast to government bonds. One reason for the level of corporate bond risk is greater.

According to Ross et al. (2015), the bond yield is influenced by many factors, namely (1) the expected inflation in the future, (2) interest rate risk. (3) lack of liquidity, (4) the risk of default, and taxation. Several previous studies have been done, including Linda and Abundanti, 2015 and the results suggested that inflation is a positive influence on bond yields. Dewi et al. 2016 research find out that interest rates negatively affect bond prices, but different from the results of research conducted by Fahrudin (2018) which states that interest rates positive effect on bond prices. Empirical studies by Gadanez et al. Different from the results of research done by David et al. (2016) which states that the exchange rate negatively affect bond yields.

Muharram (2011) in his study explains that the factors that may increase the risk of default on government bonds is a liquidity crisis, which reserves to be one measure of the liquidity level. This study Muharam (2011) proved that there is a significant negative effect of foreign exchange reserves to the government bond yields, as well as research Jacobs et al (2011). Nizar (2012) conducted a study to determine the impact of fluctuations in world oil prices on the economy of Indonesia. The results showed that world oil prices push inflation and lead to rising interest rates in the country.

Based on the above phenomena and inconsistencies in prior research on issues related to the factors that affect yields, the authors sought to reexamine the macro economic factors that affect yield corporate bonds in Indonesia.

LITERATURE REVIEW

Theory of Term Structure Interest

According Fabozzi et al. (2002), yields which is a measure for the level of potential return than bonds. According Martellini et al. (2003), the Term Structure of Interest Rate (TSIR) or the yield curve is a series of interest rates ordered by a certain maturity. Value and condition of the interest rate will determine the value and condition of the structure of time that will ultimately result in the yield curve.

Signaling Theory

Signaling theory suggests how should a company give a signal to the users of financial statements. Information for the provision of bond ratings, the ratings company, the published

financial ratios can be a signal condition of the company and describe the various risks and opportunities that occur. The financial statements can also provide useful information for investors and creditors to make investment decisions, credit, funding decisions and dividend policy (Chandra, 2008).

Assets Demand Theory

According to Mishkin (2009), some of the factors that affect the demand for bonds that will ultimately affect the price and yield bonds are as follows: (1) Wealth. As wealth increases investors certainly have a lot of resources available to be bought against an asset. Such conditions so impact on increasing the number of requests assets. Total demand for assets have a positive relationship with wealth. (2) Hope returns. The yield on an asset is a measure of how much the advantage of saving an asset. When investors make a decision to buy an asset, certainly influenced by how big returns will be obtained on investment on these assets. Total demand for assets have a positive relationship with the expectations the yield on alternative assets. (3) Risk. The level of risk or uncertainty over the course of an asset yields an impact on the demand for these assets. Investment decisions by investors depends on whether the investor is risk-averse or risk-preferred. Basically the high risk of an asset would yield obtained is also great. Risk-preferred will certainly invest in assets with a high risk because it promises high yields as well. Total demand for assets has a negative correlation with the risk on the yield on alternative assets. (4) Liquidity. Liquidity is a decisive factor at the request of an asset on how quickly these assets can be converted to cash at a low cost. An asset is said to be liquid if the asset is traded market where there are many sellers and buyers on the asset. Total demand for assets have a positive relationship with liquidity in alternative assets.

Conceptual Framework

The framework used in this study as follows:

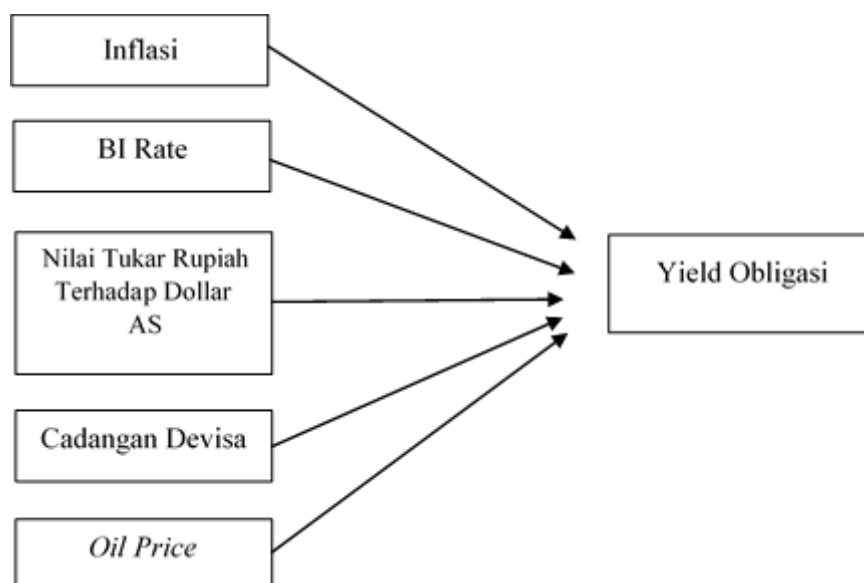


Figure 1. Conceptual Framework

From Figure framework, it can be identified that the independent variable in this study consisted of the rate of inflation (X1), the level of the BI rate (X2), exchange rate (X3), spare foreign exchange (X4) and Oil Price (X5), while the dependent variable is the bond yield (Y).

Hypothesis

Inflation is a rise in general prices are continually in a given period. If the investor estimates that the increase in inflation, investors will ask for higher compensation for their decline in the real value of cash flows derived from bonds. Therefore, under conditions where inflation is estimated to go up, bond prices will go down but its yield will increase.

H1 : Inflation positive effect on yield corporate bonds.

BI Rate is the interest rate that reflects the policy or monetary policy stance set by Bank Indonesia. The interest rate effect on the level of bonds, this is because when interest rates increase the relative will reduce the yield received by investors, this is because the interest on the bonds that are fixed, so investors will require compensation by asking yield higher, in other words, if the interest rate increases then the magnitude of the yield required by investors will also increase (Ibrahim, 2008).

H2 : BI Rate positive effect on the yield of corporate bonds.

Samuelson and Nordhaus (1995) revealed that when the dollar exchange rate is too high will lead to higher interest rates thus slowing economic growth. Higher interest rates tend to reduce investment. The local currency of a country which has depreciated, meaning that the local currency weakened against the US Dollar, pushing interest rates higher and further would lower bond prices and increase yields. Research Gadanecz, et al (2014) revealed that when the exchange rate volatility increases, the compensation investors require higher yields.

H3 : Exchange rate positive effect on the yield of corporate bonds.

One of the indicators used to determine the safety of bond investments is through the liquidity ratio. Muharram (2011) in his study explains that the factors that may increase the risk of default on government bonds is a liquidity crisis, which reserves to be one measure of the liquidity level. If a country has a good liquidity in the economy (large reserves), then the default risk would be low so that the lower the yield of the bond, and vice versa.

H4 : Backup Foreign exchange negatively affect yield corporate bonds.

Nizar (2012) conducted a study to determine the impact of fluctuations in world oil prices on the economy of Indonesia. The results showed that world oil prices push inflation and lead to rising interest rates in the country. So, when oil prices shot up will lead to inflation and increased interest rates. Then the bond market will respond to this by lowering prices and raising bond yields.

H5 : Oil Price has a positive effect on the yield of corporate bonds

RESEARCH METHODS

This type of research used in this study is a quantitative approach to the type of associative causal research. This study will be conducted using time series data with the approach of Vector Auto Regression (VAR) if the data used is stationary and there is no cointegration, or approaches Vector Error correction model (VECM) if the data used later found to be stationary but there is cointegration.

Measurement of variables in this study using a time series analysis were processed using Eviews program 10. This research was conducted using monthly data within the period of 2015 to 2018. The researchers used secondary data by collecting, recording, and reviewing data from financial website namely the website of Bank Indonesia, and Indonesian bloomberg website Corporate Bond Index.

FINDINGS AND DISCUSSION

Table 1. Unit Root Test

Variables	level		First Difference	
	<i>P-value</i>	Status	<i>P-value</i>	Status
Yield	0.6295	not stationary	0.0000	stationary
Inflation	0.3613	not stationary	0.0000	stationary
BI Rate	0.6022	not stationary	0.0058	stationary
Exchange rate	0.4107	not stationary	0.0000	stationary
Foreign exchange reserves	0.7261	not stationary	0.0000	stationary
Oil Price	0.2583	not stationary	0.0002	stationary

From the test results ADF (Augmented Dickey- Fuller) note that the data yield, inflation, BI rate, exchange rate, foreign exchange reserves and oil prices are not significant at conventional significance level (5%), in other words to have a unit root / not stationary. Furthermore, the re-testing stationarity of each variable in the first differences using ADF test, the result for each variable the results of the first distinction is already stationary. This is evident from the p-value of the test that is smaller than the conventional real level (5%).

After conducting stationary test data, the next step is the selection of the optimal lag. Criteria for the selection of optimal lag done by several stages, first by selecting the maximum number of models lag VAR / VECM which still provides a stable model results. VAR stability need to be tested because if the VAR estimation unstable stability analysis of IRF and FEVD then become invalid.

Based on test results, a VAR system is stable if the entire root or roots of its own modulus smaller than one. In this study, based on VAR stability test shown in Table 1 it can be concluded that the estimated VAR stability that will be used for the analysis of IRF and FEVD has been stable since the range of modulus <1. Also evidenced by the absence of the inverse value of AR characteristic polynomial root out of a unit circle.

Table 2. Stability Testing Model

Roots of Characteristic Polynomial	
root	modulus
0.928547 - 0.282081i	0.970448
0.928547 + 0.282081i	0.970448
0.951917	0.951917

0.693575 - 0.602357i	0.918629
0.693575 + 0.602357i	0.918629
-0.192963 + 0.896906i	0.917429
-0.192963 - 0.896906i	0.917429
0.865220 - 0.244652i	0.899144
0.865220 + 0.244652i	0.899144
0.519081 - 0.701314i	0.872517
0.519081 + 0.701314i	0.872517
0.228101 - 0.819769i	0.850912
0.228101 + 0.819769i	0.850912
-0.613669 + 0.543879i	0.819996
-0.613669 - 0.543879i	0.819996
0.717779	0.717779
-0.034896 - 0.714227i	0.715079
-0.034896 + 0.714227i	0.715079
-0.696373	0.696373
-0.564418 - 0.212348i	0.603042
-0.564418 + 0.212348i	0.603042
-0.203031 - 0.342322i	0.398002
-0.203031 + 0.342322i	0.398002
0.280919	0.280919

No root lies outside the unit circle.
VAR satisfies the stability condition.

This stability test can be met until the 4th lag, thus the maximum lag of the VAR model is 4. Furthermore, of the amount of the maximum lag obtained, we determined the optimal lag number. Testing the optimal lag length is very useful to eliminate the problem of autocorrelation in the VAR system is used as a VAR stability analysis. So with the use of optimal lag is not expected to reappear autocorrelation problem. Some of the criteria that can be used to determine the order or lag optimal model the factors that affect yield include: sequential modified LR test statistic (LR), the final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SIC) and Hannan-Quinn (HQ). The test results from the optimal lag those criteria are presented in Table 2.

Table 3. Optimal Lag Test Results

VAR Lag Order Selection Criteria

lag	LogL	LR	FPE	AIC	SC	HQ
0	80.99504	NA	1.33e-09	-3.408866	-3.165567	-3.318639
1	315.7691	394.8473	1.61e-13	-12.44405	-10.74096 *	-11.81246
2	361.2895	64.14235	1.15e-13	-12.87679	-9.713913	-11.70385
3	403.6432	48.12919	1.11e-13	-13.16560	-8.542926	-11.45129
4	472.3027	59.29683 *	4.39e-14 *	-14.65012 *	-8.567656	-12.39445 *

* Indicates a lag order selected by the criterion

LR: LR modified sequential statistical test (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 4. Johansen Cointegration Test Results

Unrestricted Cointegration Rank Test (Trace)

hypothesized No. of CE (s)	eigenvalue	Trace statistics	0:05 critical Value	Prob. **
none *	0.550585	109.0872	95.75366	0.0044
At most 1 *	0.512674	72.29601	69.81889	0.0313
At most 2	0.267556	39.23020	47.85613	0.2512
At most 3	0.242937	24.90728	29.79707	0.1648
At most 4	0.203692	12.10507	15.49471	0.1520
At most 5	0.034765	1.627672	3.841466	0.2020

Trace test indicates 2 cointegrating eqn (s) at the 0:05 level

* Denotes rejection of the hypothesis at the 0:05 level

** MacKinnon-Haug-Michelis (1999) p-values

The purpose of this research on the cointegration tests that determine whether the group of variables that are not stationary at the level of these levels meet the requirements of the integration process, which is where all the variables have been stationary at the same degree that first difference. This study uses cointegration test of Johansen Trace test Statistic. From the test results can be seen that there is a cointegration relationship shown by their two cointegration equation Trace-statistic value based on the real level of 0.05. Thus the above VAR models can be developed into a model VECM.

Analysis of Impulse Response Function (IRF)

IRF analysis is used to determine how long it takes to respond to changes in the dependent variable in the independent variables that will eventually restore the balance point before the shock.

When the shocks of one standard deviation in inflation then the yield will react positively at 0.03 in the second period. This increase continues until the seventh period. As a result of inflation shocks of one standard deviation, causing the yield to rise to its long-term equilibrium conditions for 0106 which started a period of eight.

In the event of shock or shock BI rate by one standard deviation of the yield of corporate bonds in the second period positively responded 0011, after it moves down in the three 0.006. As a result of shock BI rate by one standard deviation, causing the yield to rise to its long-term equilibrium conditions of 0.026 which occurred from period to eight.

In the event of shock or shocks of one standard deviation of the exchange rate then yields will react negatively at -0044 in the second period. In the next period moved up so that the yield responds positively in the period of three to six periods. As a result of exchange rate shocks of one standard deviation, causing the yield to rise to its long-term equilibrium conditions for 0035 which started the period of the seventh.

In the event of shock or shocks of one standard deviation in the yield of foreign exchange reserves will react negatively at -0.094 in the second period. Then moves up in the three but still in a negative position. Shocks due to foreign exchange reserves of one standard deviation, causing the yield to rise to its long-term equilibrium conditions of -0.08 which started the fourth period.

In the event of shock or shocks of one standard deviation in the oil price will react positively yield of 0.085 in the second period. This increase continues until the period of six. As a result of oil price shocks of one standard deviation, causing the yield to rise to its long-term equilibrium conditions for 0.176 which started the period of the seventh.

Forecast Error Variance Decomposition (FEVD)

FEVD is the method used to see what kind of change a variable that is indicated by the error variance is influenced by other variables that can be seen the impact of these variables on FDI inflows.

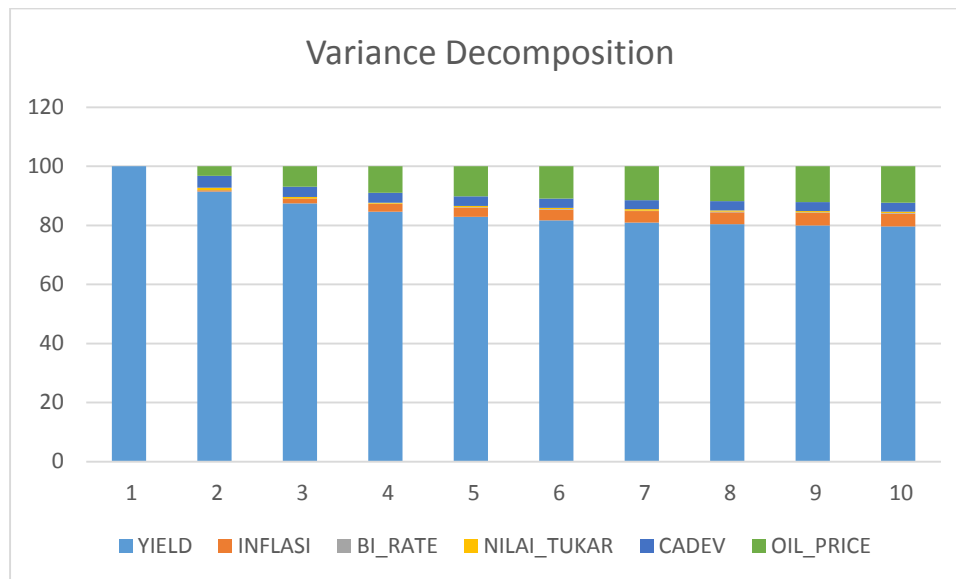


Figure 2. Results of Variance Decomposition

Based on the picture above, future inflows of yield will be greatly influenced by the yield itself, as shown pictures of the estimation FEVD. The next variable that affects the inflow of future yields are variable oil price, which if there is an increase or decrease in the flow of foreign exchange reserves will affect the current yield. Further variables that affect yield in the future after the oil price is inflation, foreign exchange reserves, exchange rate, then the latter is the BI rate.

Effect of Inflation on Corporate Bond Yield

Based on the analysis of Impulse Response Function (IRF) can be seen that when the shock on inflation will lead to yield a positive effect. This is consistent with the hypothesis that the statement has been made before. According Suparmoko (1990) if the inflation rate under mild conditions (at <10%), making investors interested in investing in the sector including bonds. Bond yields have increased due to investor expectations of inflation rate. The increase in yield is triggered by profit-taking (profit taking) from investors. The increase in inflation which has a high risk of the reason investors to take profits by requiring a high yield.

Therefore, when inflation increases, it will be followed by the increase in the level of bond yields. This is consistent with the results of Kurniasih, Augustina and Yulia Restika

(2016) also Santosa and Sihombing (2015) that there is a positive influence between inflation and bond yields.

Effect of BI Rate on Corporate Bond Yield

Based on the analysis of Impulse Response Function (IRF) can be seen that the variable BI Rate positive effect on the yield of corporate bonds in Indonesia. It is characterized by the presence of a positive reaction in bond yields when the shock of the variable BI rate. The results are consistent with the hypothesis that the statement has been made before.

Bank Indonesia will generally raise the BI rate when inflation is expected to exceed the target set, otherwise the central bank will lower the BI rate when inflation is estimated to be below the targets. Dal this if investors foresee interest rate increases, investors will be able to estimate that the price of bonds and stocks will tend to decline. In addition, higher interest rates would also cause investors signaled the return of an investment will increase (Tandelilin, 2007).

Therefore, when the BI rate increase, it will be followed by the increase in the level of bond yields. These results are consistent with research Orlowksi and Kirsten (2005), Prastowo (2008), as well as Wibisono (2010) that the BI rate positive effect on bond yields.

Effect of Exchange Rate on Corporate Bond Yield

Based on the analysis of Impulse Response Function (IRF) can be seen that the variable exchange rate positively affects corporate bond yields in Indonesia. It can be seen from the positive reaction yields when the shock given by a variable exchange rate. The results are consistent with the hypothesis that the statement has been made before.

Exchange rate can be increased (appreciation) or decrease (depreciation) in accordance with economic conditions. At the macro-economic system in case of increase in the exchange rate means that there is a supply of dollars in an amount greater than the previous period. This can occur because the export value of imports of goods and services, foreign exchange reserves increased investment flows. The rupiah strengthened and relatively stable has attracted the confidence of foreign investors to invest in Indonesia capital market, on the contrary if the value of the dollar rose against the rupiah (dollar appreciation), then the investor will tend to switch on forex derivatives that bond prices decline but yield its increase.

Therefore, when the exchange rate is increased, it will be followed by the increase in the level of bond yields This is in line with research conducted by Gadanecz, et al (2014) and Wibisono (2010), which revealed that the exchange rate has a positive effect on bond yields.

Effect of Foreign Exchange Reserves on Corporate Bond Yield

Based on the analysis of Impulse Response Function (IRF) can be seen that the variable reserves negatively affect the yield of corporate bonds in Indonesia. This is consistent with the hypothesis that the statement has been made before.

If a country has a good liquidity in the economy (large reserves), then the default risk would be low so that the lower the yield of the bond, and vice versa. This is in accordance with the Asset Demand Theory is when risk assets fell, the demand will rise which causes bond prices also rose, but its yield right downhill. This is in line with research Jacobs, et al (2011) which states that there is a negative effect of foreign exchange reserves on bond yields.

Effect of Oil Price on Corporate Bond Yield

Based on the analysis of Impulse Response Function (IRF) can be seen that the oil price variable positive effect on the yield of corporate bonds. It can be seen from a positive yield response when the oil price shock of the variables in the analysis of IRF. The results of this study are in line with the hypothesis statement that has been made previously, which has a positive effect on corporate bond yields in Indonesia.

The increase in oil price will increase production costs due to the absence of input substitution between the production factors. High production costs will reduce cash inflows and will affect corporate profits. The increase in oil price inflation will also affect the impact rising interest rates and making investments in bonds become more attractive. Therefore, when the oil price increases, it will be followed by the increase in the level of bond yields. This is consistent with the results of research Nizar (2012) who said that oil prices positive effect on bond yields.

CONCLUSION AND SUGESTION

The test data by using E-views 9 with the method VECM can be concluded the following: Variable inflation positive effect on the yield of corporate bonds. Variable BI positive effect on the yield of corporate bonds. Variable exchange rate positively affects yield corporate bonds. Variable foreign reserves negatively affect yield corporate bonds. Variable oil price positive effect on the yield of corporate bonds.

From the research results obtained by the authors submit suggestions for the company that is able to consider the factors above especially in the oil price factor that the variable is based Forecast Error Variance Decomposition in the next period as composition of a greater influence on the yield compared with other variables. We hope this research can provide information to make decisions for the company to improve its performance and can attract more investors so that they can compete and grow.

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