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Research Article

Macroeconomic Variables Effect on 10-Year Tenor Government Bonds Yield

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Abstract
This study aims to analyze the effect of macroeconomic conditions on the yield of 10-year government bonds. The macroeconomic indicators studied were the consumer price index, BI 7 days reverse repo rate, foreign exchange reserves, Indo CDS 5 years, and the Government Budget Deficit from January 2009 to December 2019. This research uses the Vector Error Correction Model (VECM) method because there is cointegration between variables, indicated by Trace Statistics and Max-Eigenvalue statistics, which are greater than Critical Value. The analysis results show that the Consumer Price Index (CPI) and the Government Budget Deficit positively influence the 10-year tenor government bond yield. In contrast, the 5-year Indo CDS, BI 7 days reverse repo rate, and Foreign Exchange Reserves negatively affect the 10-tenor government bond yield year. The policy implications for the yield of 10-year government bonds can be beneficial and useful for the government as the economic authority in issuing bonds, the regulator (Bank Indonesia), and helping investors to develop investment strategies in government bonds by continuously monitoring and predicting the direction of movement of these variables so that they can creating an optimal portfolio of government bonds.

Keywords: Consumer Price Index, BI7RR, Foreign Reserve, Yield Government Bond, VECM

JEL Classification: E00, E22, E44

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1. Introduction

The financial market, especially bonds, is an important alternative funding source in today's economic growth. The economic crisis in Asia in 1997-1998 stimulated the development of the need for domestic bond markets to reduce the vulnerability of exchange rate uncertainty and maturity (Piesse et al., 2007). The Indonesian government bond market and diversified corporate bonds are the main supporting factors in the modern economy (World Bank, 2006).

Indonesia's well-developed bond market offers a wide range of funding opportunities for the public and private sectors. The bond market can help the government increase access to financial services, reduce the cost of funds, improve financial conditions, and provide long-term financing for infrastructure projects (Santosa & Sihombing, 2015). Therefore, the Government of Indonesia, through the Ministry of Finance, especially DJPRR and OJK, is gradually preparing legal regulations and supporting infrastructure for the capital market, especially bonds. In his research explained that the bond market can be a link between companies that need long-term funds and investors who want to place their funds in securities related to long-term interest.

The creation of a strong domestic bond market will reduce dependence on foreign debt and strengthen the resilience of the country's financial system to global volatility. However, most of this amount was initially driven by the recapitalization of the banking system. Until now, the bond market has become an alternative for the government to meet its regular funding needs, with a total annual net emission value of around 1 percent of the Gross Domestic Product (GDP) (World Bank, 2006).

In the last five years, the government has consistently implemented expansive fiscal policies to accelerate national development while maintaining economic growth momentum so that growth remains high and sustainable. The government also implemented an expansionary fiscal policy to avoid opportunity loss in line with the increasing achievement of various national development goals and targets (Sihombing et al., 2014). To support the implementation of expansionary fiscal policy, the government implements a deficit budget based on strengthening a sound and sustainable fiscal policy management. In implementing a deficit budget, the government continues to perform risk treatments for various risks that can potentially create deviations in the state budget performance. The budget deficit is generally under control and within the risk appetite level. The realization of the deficit each year also continues to be lower than the target without reducing the achievement of national development goals and targets that have been set.

The government has taken various steps and policies to restructure debt from foreign loans (loans) to state securities (SBN). It aims to reduce the government's dependence on politically unfavorable donor countries. In addition, there is an attachment to terms related to politics. Interest rate requirements also bind Indonesia's foreign debt in the form of a loan, the term of the debt, and the amount of installments the government must pay (Sihombing et al., 2013).

Government funding from within the country has made the Indonesian bond market grow, as seen by the trend in the value of bond issuance on the market. The government continuously issues a series of bonds with various maturities that can be used as a benchmark for other bonds.

The ownership of bonds is mostly owned by financial institutions, such as banks and institutions from the Non-Bank Financial Industry (IKNB), so that these parties can obtain capital gains and interest income (coupons/yields) from holding government bonds. In addition, these financial institutions also make bonds as a secondary reserve. If the institution experiences liquidity difficulties, bonds can be sold, or repurchases can be made to cover the liquidity needs currently facing the financial institution.

Several recent studies have linked the bond market with macroeconomic fundamentals. Hordahl et al.'s research. (2006), Diebold et al. (2006), Cherif and Kamoun (2007), and Afonso and Martins (2012) have researched the relationship between yield and macroeconomics, such as economic growth, interest rates, inflation, exchange rates, and others. The results of their research found that the macro economy influences the movement of yields with different levels of significance for different term yields.

Research on yield often only looks at the influence of macroeconomic fundamentals such as interest rates, inflation, economic growth, money supply, and exchange rates, especially in developed countries. This study develops research for developing countries, namely Indonesia, by looking at the influence of macroeconomic fundamentals, liquidity factors, external factors, and market risk on yields of state bonds.

Comprehensive research on the influence of macroeconomic fundamentals, liquidity factors, external factors, and market risk has been carried out by Grandes (2007), Baldacci et al. (2008), Alexopoulou et al. (2009), and Gibson et al. (2012) who researched the yield spread of sovereign bonds.

Gibsons et al. (2012) stated that the liquidity factor or capital flow is related to a country's ability to access the foreign currency needed to sell its bonds, such as export growth and the ratio of foreign exchange reserves to GDP, negatively affecting the yield spread. Meanwhile, the debt service ratio (payment of debt/exports) positively affects the bond yield spread. Marcilly (2009) found the effect of foreign investor participation on government bond yield spreads and exchange rates in developing country bond markets, especially Indonesia and Malaysia.

Gibsons et al. (2012) stated that oil prices and international interest rates tend to be the most important sources of external shocks for emerging market bond markets. Interest rates are usually indicated by interest rates denominated in US dollars due to the dominance of emerging market debt denominated in dollars.

The Indonesian government bond market has developed rapidly, but it is still rare to research state bond yields. The need for more research on developing country bond markets is one of many characteristics of the Indonesian bond market. Min (1998) states this condition also occurs in other developing country bond markets.

2. Literature Review and Hypothesis

Investment Theory

Investment can be associated with investing funds in real assets such as land, gold, houses, and other real assets or in financial assets such as deposits, stocks, bonds, and other securities (Tandelilin, 2010). Investment can be defined as an effort to delay current consumption to be allocated to productive assets for a certain period (Jogiyanto, 2009). In understanding the concept of investing, you must know three main things that underlie the importance of investing. First, there are future needs or current needs that have not been able to be met at this time. Second, there is a desire to increase or increase the value of assets and the need to protect the value of already owned assets; third, because of the inflation factor (Santosa & Puspitasari, 2019)(Pratomo and Nugraha, 2005).

Capital market

Tandelilin (2010) says, "The capital market is a meeting between parties who have excess funds with parties who need funds by trading securities. Thus, the capital market can also be interpreted as a market that trades securities that generally have a lifespan of more than one year, such as stocks and bonds. The capital market is a place where various parties, especially companies, sell shares (stock) and bonds (bonds) with the aim that the proceeds from the sale will be used as additional funds or to strengthen the company's capital (Santosa et al., 2022). The capital market has an important role in a country. The capital market is an indicator of the success of a country's economy (Jogianto, 2013).

Crowding Out Effect Theory

The existing literature classifies the impact of fiscal policy into two, namely, the impact on the demand side (demand side effect) and the impact on the supply side (supply side effect). The impact of fiscal policy on the supply side has long-term implications. Fiscal policies that are oriented towards increasing the supply side can overcome the problem of limited production capacity and, therefore, have a more long-term impact. The impact of fiscal policy on the economy through the aggregate demand approach is explained using the Keynesian approach. The Keynesian approach assumes the existence of price rigidity and excess capacity so that output is determined by aggregate demand (demand-driven). Keynes stated that in a recession, an economy based on market mechanisms would not recover without government intervention. Monetary policy cannot restore the economy because policy only depends on lowering interest rates. In contrast, interest rates are

generally low in recession conditions and can even be close to zero.

Hypothesis

Min (1998) states that inflation can be a proxy for the quality of how a country organizes its economy. CPI is a proxy for consumption expenditure; an increase in CPI will reduce consumption expenditure and, in turn, slow down the economy. An economic slowdown will increase the risk premium, which will increase yields.

H1: There is an influence from the CPI on state bond yields.

Increases in interest rates affect short-term bond yields more sensitively than long-term bond yields (Bodie et al., 2009). Therefore, an increase in interest rates will increase yields. Tight monetary policy is expected to increase yield expectations. The increase in the BI rate is expected to increase yields.

H2: There is an influence from the BIR on state bond yields.

According to Min (1998), foreign exchange reserves are a variable that describes the condition of a country's foreign currency liquidity. Limited foreign exchange reserves can become a risk if there is a liquidity shortage. Therefore, foreign exchange reserves negatively affect bond yields. Baldacci et al. (2008) stated that the size of a country's foreign exchange reserves signals its ability to pay its debts and can act as a damper when external shocks occur.

H3: There is an influence from Foreign Exchange Reserves on yields of state bonds.

Foreign market players' perception of the domestic economy can be measured through sovereign risk. This risk results from an evaluation/assessment by a rating agency regarding the probability that a sovereign entity (state) will default on its commercial obligations. This default occurred either due to a lack of capacity or on purpose. The measurement of this risk perception has long been carried out through ratings by a rating agency. Towards the end of the 20th century, a new instrument, the Credit Default Swap (CDS), emerged as a measure of sovereign risk. As an instrument that hedges against the possibility of debt default, the premium from CDS will naturally reflect the ability to pay. Related to the sovereign context, the ability to pay can be linked to various domestic and global macroeconomic variables.

H4: There is an effect of CDS on state bond yields.

Research by Ang and Piazzesi (2003) has led to research on yield curves. Diebold, Rudebusch, and Aruoba (2006), Hordahl, Tristani, and Vestin (2006), and Cherif and Kamoun (2007) have researched the relationship between the yield curve and macroeconomics such as economic growth, inflation, exchange rates, budget deficits, and others. The results of their research found that macroeconomics influences the movement of the yield curve with different levels of significance for different term yields.

H5: There is an influence of the Budget Deficit on state bond yields.

3. Data and Method

This research used monthly secondary data from January 2009 to December 2019. Data sources were obtained based on information compiled and published by certain agencies. Secondary data comes from Bank Indonesia, IDX, BPS, Ministry of Finance, and Bloomberg websites. This research was conducted using time series data with the Vector Auto Regression (VAR) approach if the data used is stationary and there is no cointegration or the Vector Error Correction Model (VECM) approach if the data used is known to be not stationary, but there is cointegration. The stages for carrying out the analysis can be carried out by stationarity test, Optimal Lag Determination, VAR Model Stability Test, Cointegration Test, Impulse Response Function (IRF) Analysis, and Forecast Error Variance Decomposition (FEVD) (Gujarati & Porter, 2013). This research is limited to yields on state bonds; in fact, it can be developed or added to corporate bond index yields and index returns on other investment instruments such as mutual funds, deposits, and stocks, and the period used in this study only uses the time range from January 2009 to December 2019. The VAR-VECM Engineering Flowchart and Econometric Statistical Test are:

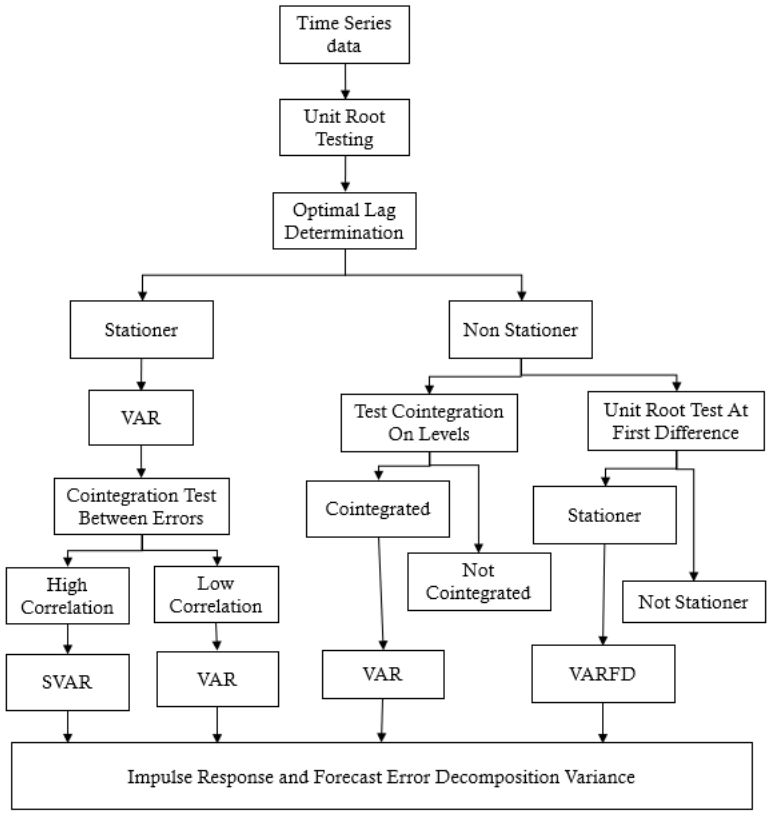

Figure 1. VAR-VECM Engineering Flow Chart and Econometric Statistical Test

4. Results

Data Description

Based on the sampling technique, the criteria used in this writing are the January 2009 - December 2019 bond yields expressed in nominal units. The total number of months in the year is 132.

Table 1. Results of Data Description

	BI7DRRR	BOND	CDS	DEVISA	DFA	IHK
Mean	6.219697	7.793045	173.2518	105.3822	-0.230061	127.0404
Median	6.500000	7.688000	161.4400	110.6565	-0.221000	127.0300
Maximum	8.750000	13.58700	656.4510	131.9800	-0.108000	146.8400
Minimum	4.250000	5.191000	67.72100	50.56400	-0.363000	110.9920
Std. Dev.	1.055262	1.468601	84.36430	19.77615	0.075485	8.999528
Observations	132	132	132	132	132	132

From Table 1, it can be seen that the average bond yield is 7.79 percent over 11 years with 132 observational data. The maximum bond yield value reached 13.59 percent, and the lowest level was 5.19 percent. This lowest level is the initial withdrawal value at the end of December 2012, and at the end of December 2019, the bond yield increased to 7.06 percent.

Unit Root or Stationarity Test

The stationarity of the data can be observed using the Augmented Dickey-Fuller (ADF) method with the decision criterion at a significance level of $(1-\alpha)$ 100%, $H0$ is rejected if the ADF statistic is less than the critical value at α, or the p-value is less than the significance value α or in other words if H0 is rejected then the data is stationary.

Table 2. Recapitulation of Research Variable Stationarity Test Results

Variable	Calculated ADF statistics			
	Level		First differences	
	Nilai ADF	Keterangan	Nilai ADF	Keterangan
BI7DRRR	-1.099769	Not Stationary	-7.162626	Stationary
BOND	-1.380199	Not Stationary	-12.86872	Stationary
CDS	-4.253995	Stationary	-12.59058	Stationary
DEVISA	1.794995	Not Stationary	-9.245135	Stationary
DFA	-0.471080	Not Stationary	-1.622561	Stationary
IHK	0.532885	Not Stationary	-11.28691	Stationary

Table 2 shows that almost all variables are not stationary at the level (except CDS). This result is shown by the Augmented Dickey-Fuller (ADF) test results, which are almost entirely insignificant at the conventional significance level or Mc Kinnon's critical value (1%, 5%, and 10%). In the next step, by testing the level of stationarity of each variable in the study under the condition of the first difference using the ADF test, it can be found that each variable resulting from the first difference is stationary. This finding can be seen from the p-values of the two tests, which are lower than the conventional significance level (1%, 5%, and 10%).

Optimal Lag Test

Determining the optimal lag in VAR analysis is very important because the endogenous variables in the system of equations will be used as exogenous variables (Enders, 2010). This optimal lag length test is useful for eliminating autocorrelation problems in VAR systems.

Table 3. Optimal Lag Test Results

LogL	LR	FPE	AIC	SC	HQ
-623.2337	144.4771	0.003305	11.31022	13.08247	12.03088

Several provisions and criteria that can be used to determine the optimal order or lag of the model of the factors that influence the movement of the yield of the sovereign bond index include sequential modified LR test statistics (LR), final prediction error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn (HQ). Table 3 shows that the recommended optimal number of lags is 1 (based on LR criteria) and 2 (based on HQ and FPE criteria). In the end, a VAR/VECM model with order 2 will be selected based on the results of selecting the optimal lag.

Cointegration Test

The Johansen test method is used to test for cointegration (Rosadi, 2012). Johansen's test for cointegrating variables. At this stage, we will look for the number of ranks of cointegration equations that can be formed. With H0: rank r = 3 versus H1: rank r = 4.

Table 4. Cointegration Test Results

HypothesizedNo. of CE(s)	Trace Statistic	0.05 Critical Value
None *	143.1392	95.75366
At most 1	55.66370	69.81889
At most 2	31.53518	47.85613
At most 3	16.98650	29.79707
At most 4	6.678124	15.49471
At most 5	0.326080	3.841466

In Table 4, there is a cointegration relationship as indicated by a cointegration equation based on the Trace Statistical value at the 5% significance level with a Trace Statistical value higher than the Critical Value. Thus, the VAR model can be developed into a VECM model.

VECM estimation

The VECM model will produce two main estimation outputs: measure the cointegrating or long-term balance relationship between variables in the study and measure error correction or the speed at which these variables move towards their long-term balance.

Table 5. VECM Estimation Results

Variable	Coefficient	T-stat	Information
		Short-term	
D(BOND(-1))	-0.065099	-0.56648	Not significant
D(IHK(-1))	0.016737	1.47865	Not significant
D(BI7DRRR(-1))	-0.115649	-0.50802	Not significant
D(DFA(-1))	20.61770	2.49292	Significant
D(CDS(-1))	-0.001267	-0.88364	Not significant
D(DEVISA(-1))	-0.020660	-1.41789	Not significant
C	-0.037779	-1.00571	Not significant
CointEq1	-0.052186	-4.78448	Significant
		Long-term	
BOND(-1)	1.000000		
IHK(-1)	-0.113271	-2.07086	Significant
BI7DRRR(-1)	-2.940962	-5.42900	Significant
DFA(-1)	7.204750	1.56369	Not significant
CDS(-1)	0.064981	8.51760	Significant
DEVISA(-1)	0.068237	2.41052	Significant

From the results of the VECM estimation test in Table 5, the short-term and long-term estimation coefficients for the government bond yield equation are obtained. The estimation results show that in the short term, one variable and one error correction variable significantly affect the movement of government bond yields. The amount of the adjustment or adjustment from the short term to the long term is -0.052186 percent. On the other hand, in the long run, four variables significantly affect the movement of government bond yields.

Impulse Response Function (IRF)

IRF is an analytical tool used to explain the impact of a shock on one variable on other variables. In this analysis, the period that can be analyzed is short-term and can be analyzed for several future horizons (monthly) as long-term information.

Table 6. Impulse Response Yield Test for Government Bonds

Period	BOND	IHK	BI7DRRR	DFA	CDS	DEVISA
1	0.403071	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.347760	0.053646	-0.001582	0.085837	-0.087365	-0.055899
3	0.407625	0.082562	0.031203	0.054038	-0.134265	-0.067129
4	0.363361	0.074174	0.046276	0.049606	-0.116188	-0.074803
5	0.366586	0.077371	0.065247	0.018403	-0.138862	-0.074050
6	0.356192	0.075435	0.072175	0.006655	-0.142682	-0.078861
7	0.356176	0.077143	0.080116	-0.010454	-0.153975	-0.080989
8	0.350721	0.077298	0.084921	-0.022953	-0.157846	-0.084133
9	0.348082	0.078077	0.089344	-0.036419	-0.163126	-0.086257
10	0.344291	0.078260	0.092336	-0.047693	-0.166043	-0.088585
11	0.341563	0.078573	0.094812	-0.058360	-0.168976	-0.090480
12	0.338704	0.078699	0.096651	-0.067655	-0.170973	-0.092272
13	0.336314	0.078847	0.098153	-0.076099	-0.172767	-0.093813
14	0.334063	0.078927	0.099328	-0.083542	-0.174142	-0.095208
15	0.332098	0.079002	0.100293	-0.090190	-0.175329	-0.096428
16	0.330315	0.079049	0.101077	-0.096061	-0.176295	-0.097515
17	0.328741	0.079088	0.101729	-0.101266	-0.177123	-0.098469
18	0.327336	0.079116	0.102273	-0.105860	-0.177820	-0.099314
19	0.326094	0.079138	0.102733	-0.109919	-0.178420	-0.100057
20	0.324992	0.079155	0.103123	-0.113499	-0.178934	-0.100712

21	0.324019	0.079168	0.103457	-0.116656	-0.179378	-0.101289
22	0.323159	0.079179	0.103744	-0.119437	-0.179764	-0.101797
23	0.322400	0.079187	0.103992	-0.121887	-0.180099	-0.102244
24	0.321731	0.079194	0.104207	-0.124045	-0.180391	-0.102637

Forecast Error Variance Decomposition (FEVD)

After analyzing dynamic behavior using Impulse Response, we will look at the characteristics to characterize the dynamic structure between variables in the VECM model through Variance Decomposition (VD).

Table 7. Variance Decomposition Yield Results for Government Bonds

Period	S.E.	BOND	IHK	BI7DRRR	DFA	CDS	DEVISA
1	0.403071	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.551733	93.09951	0.945408	0.000822	2.420421	2.507372	1.026466
3	0.709797	89.23222	1.924197	0.193753	2.042056	5.093113	1.514658
4	0.815501	87.45214	2.284988	0.468789	1.917001	5.888246	1.988834
5	0.913660	85.76905	2.537489	0.883449	1.567791	7.000909	2.241315
6	0.999584	84.35522	2.689516	1.259448	1.314274	7.886567	2.494972
7	1.081099	82.96818	2.808391	1.625853	1.132903	8.770561	2.694109
8	1.156498	81.69921	2.900867	1.959952	1.029388	9.527080	2.883501
9	1.228049	80.49034	2.976900	2.267519	1.000880	10.21373	3.050630
10	1.295756	79.35841	3.038706	2.544549	1.034490	10.81630	3.207540
11	1.360499	78.28813	3.089921	2.793795	1.122379	11.35395	3.351819
12	1.422510	77.28058	3.132469	3.017161	1.252853	11.83022	3.486717
13	1.482206	76.32944	3.168209	3.217543	1.417568	12.25512	3.612118
14	1.539804	75.43264	3.198360	3.397448	1.607860	12.63445	3.729248
15	1.595543	74.58658	3.223962	3.559337	1.817002	12.97462	3.838494
16	1.649590	73.78878	3.245801	3.705371	2.038997	13.28051	3.940538
17	1.702101	73.03645	3.264524	3.837483	2.269091	13.55661	4.035837
18	1.753198	72.32713	3.280647	3.957352	2.503341	13.80663	4.124903
19	1.802994	71.65835	3.294596	4.066443	2.738648	14.03379	4.208173
20	1.851580	71.02778	3.306717	4.166022	2.972557	14.24085	4.286076
21	1.899040	70.43317	3.317296	4.257186	3.203185	14.43016	4.359004
22	1.945446	69.87235	3.326569	4.340884	3.429103	14.60377	4.427326
23	1.990862	69.34325	3.334733	4.417938	3.649265	14.76343	4.491383
24	2.035346	68.84391	3.341951	4.489062	3.862925	14.91065	4.551494

Based on Table 7, in the initial period, the yield variable for state bonds made the largest contribution, namely 100 percent. In the following period, the contribution of state bond yields began to decline to 93.09 percent, followed by BI7DRRR 0.0008%, foreign exchange reserves 1.026%, consumer price index 0.945%, DFA 2.420%, and CDS 2.507%. However, over time, the contribution of government bond yields tends to decrease and moves relatively constant in the range of 68.84 percent. The opposite is shown by the contributions of CPI, BI7DRRR, DFA, CDS, and DEVISA, which tended to increase in the long term up to the 24th period to around 3.34 percent, 4.48 percent, 3.86 percent, 14.91 percent, and 4.55 percent. If sorted, the variables that give the largest to the smallest contribution to the yield of state bonds are the yield of the state bonds themselves, CDS, Foreign Exchange Reserves, BI7DRRR, DFA, and CPI.

5. Discussion

The Consumer Price Index (CPI) variable in the first lag has no significant positive effect in the short term but has a significant negative effect in the long term. This finding indicates that an increase in the CPI of 1 percent in the previous year will increase the yield of state bonds by 0.016737 percent in the current year but will experience a long-term decline of 0.113271 percent. The Consumer Price Index is an index that measures changes in the weighted average price of goods and services consumed by the public in a certain period, which is used as a proxy to calculate the inflation rate. A country's inflation rate can have a negative or positive impact, depending on how high the inflation rate is. Suppose the inflation rate is still classified as mild inflation (lower

than 10%). In that case, this has the potential to have a positive impact on the economy because it can increase people's purchasing power (purchasing power) increase national income so that it can encourage a country's economic growth because it makes people enthusiastic about working, saving, and making investments such as securities or the real sector. So, an increase in inflation, which is in the mild category, can cause the yield of state bonds to decrease due to price increases due to increased demand for securities in the primary and secondary markets. On the other hand, when there is a high inflation increase, this can cause economic overheating, making investors expect higher bond yields, so bond yields increase (Strassberger, 2012).

The BI Rate variable in the first lag has no significant negative effect in the short term and a significant negative effect in the long term. This result means that when there is an increase in the BI Rate by one percent in the previous 1 year period, the yield on state bonds will increase by 0.115649 percent in the current year and the long term by 2.940962 percent. The results of research conducted by Bodie et al. (2009) state that increases in interest rates will affect bond yields more in the short term than in the long term, so the increase in interest rates can increase the yield curve of government bonds. Implementing a tightening monetary policy, such as increasing the discount rate, can increase expectations of government bond yields (Maltritz & Molchanov, 2013).

In the first lag, the Foreign Exchange Reserves variable has an insignificant negative effect in the short term but a significant positive in the long term. This finding means that when there is an increase in foreign reserves or foreign exchange reserves by one percent in the previous year, the yield on state bonds will decrease by -0.020660 percent in the current year but will increase by 0.068237 percent in the long term. Research conducted, shows that a factor that can potentially increase the risk of default on a government bond is a liquidity crisis, where foreign exchange reserves measure a country's liquidity level. The results of research conducted by Muharam showed a significant negative effect between foreign exchange reserves and government bond yields; this indicated that a decrease in government bond yields would accompany an increase in foreign exchange reserves (Che-Yahya et al., 2017).

Meanwhile, the budget deficit variable in the short term has a significant effect on government bond yields, but in the long term, it has no significant effect. The CDS variable in the short term has no significant effect on state bond yields, but it significantly affects state bond yields in the long term.

6. Conclusion

From the research that has been done, the results are: 1). The shocks that occurred in the Consumer Price Index (CPI) had a statistically positive effect on yields on state bonds. In the short term, an increase in the CPI indicates that the prices of the majority of goods or services consumed by the public tend to increase (inflation occurs), which causes purchasing power to decrease so that investment demand in bonds decreases and causes bond yields to increase. 2) The shock in the BI7DRR interest rate had a statistically negative effect on yields on state bonds. An increase in BI7DRRR will distort asset prices and reduce investment in government bonds. This finding is what then makes the yield of state bonds increase. 3) Shocks that occur in foreign exchange reserves (DEVISA) negatively affect the yield of the state bond index statistically. An increase in foreign exchange reserves (a proxy for a country's foreign exchange liquidity) will increase the flow of capital from abroad, thereby increasing the purchase of bonds and reducing yields on state bonds. 4) Credit Default Swap (CDS) shocks negatively affect government bond yields. CDS is an indicator of investment risk in a country. The increase in CDS indicates that investment risk in the country has increased. 5) DFA shock of one standard deviation will be responded to positively by the yield of state bonds. The increase in DFA will be responded positively by the yield of bonds in the second period of 0.085 percent. However, in the long term, the increase in DFA will be responded negatively by the yield of state bonds in the seventh period of 0.010 percent.

Recommendation

Suggestions for subsequent research, non-economic factors (politics, regulation, security,

supervision, education, and investment behavior) and related foreign fundamental factors such as US treasury yields, Fed Funds Rate, macroeconomic indicators of other countries, or conditions global politics, can be included in the country bond index model together with economic factors. This recommendation considers non-economic factors that occur dynamically or change in each period. Future research should include an analysis of variables in the form of indexes on investment instruments other than bonds, such as corporate bond indexes, mutual fund indexes, stock indexes, deposit indexes, sectoral stock indexes, Jakarta Islamic Index, IDX30, LQ45, and Kompas100.

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