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MACROECONOMIC FACTORS AND THE CRISIS-INDUCED SENTIMENT OF FEARS IMPACT ON INDONESIAN GOVERNMENT BOND YIELD

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ABSTRACT

Great Financial Crisis 2008 and the COVID-19 crisis are two world crises that happened in the last 20 years, yet there's so little literature that connects the sentiment of fear to the bond market. This study focuses on analyzing the impact of the sentiment of fear caused by the two crises that occurred in Indonesia, namely the Great Financial Crisis in 2008 and the COVID-19 Pandemic, along with macroeconomic factors to 10-year Indonesian government bond yields using VECM methods. The results showed that only the Federal Reserve interest rate has a significant impact on the government bond yield in both crises, while the rest is not significant. This result shows that in both crises, the Indonesian government bond yield was affected by only the Federal Reserve's reaction to the crises, while not considering how both crises could cause negative sentiment from the investors.

Keywords: COVID-19, Great Financial Crisis, Macroeconomics, Sentiment of Fear, VECM
Klasifikasi JEL: G01. G11

INTRODUCTION

Economic conditions, both in a country and globally, will be very easily influenced if there is a condition that is out of the ordinary. The economic crisis that occurred in the United States in 2008, which is often referred to as the Great Financial Crisis, had an impact on the economies of other countries. The impact of the crisis took place in the years after 2008. Countries in Asia did not escape the effects of the Great Financial Crisis, although the effect is not as big as what happened in European countries (Park et al, 2013). In Indonesia, a good response from the Indonesian government, and a lower ratio of exports to Gross Domestic Product (GDP) made the impact of the Great Financial Crisis on Indonesian economic growth isn't too big (Basri & Raharja, 2010). After the Great Financial Crisis passed, at the beginning of 2020. the crisis re-emerged as a result of the COVID-19 pandemic that has occurred to date. As a result of this pandemic, the world economy can be said to have stalled in the early days of this pandemic. The COVID-19 pandemic has significantly disrupted the Indonesian

economy. This disruption continues as long as the positive rate of COVID-19 cases is on an increasing trend (Olivia, et al. 2020).

Either way, both the Great Financial Crisis and the COVID-19 pandemic have created uncertainty in society. These two crises are unpredictable things, that cause future developments will also be difficult to predict. This creates anxieties in the community. This anxiety can also have an impact on the investment decisions of the public and companies in Indonesia. Unfortunately, most studies that related to the bond market with significant concern, fear, and even panic among the population due to the pandemic were usually conducted in advanced countries such as European Countries. For example, Andrieş, et al. (2021) assess the impact of the pandemic in Europe on European government sovereign CDS, and they found that a higher number of cases and deaths and public health containment responses significantly increase the uncertainty among investors in European government bonds. Other examples research to find the impact of COVID-19 fear on the sovereign bond yield of G7 (Paule-Vianez, et al. 2021). Even those researchers also reckon that literature exploring the relationship between the sentiment of fear and bond markets is very few.

Government bonds are considered risk-free investments because the government is (considered) able to guarantee the returns that investors will receive. Returns received will be affected by monetary policies implemented by the government as a reaction to current economic conditions. Therefore, this study will look at whether macroeconomic factors and external factors, along with the anxiety variable caused by GFC and COVID-19, which we called sentiment of fear, have an impact on the magnitude of the yield of Indonesian government bonds. The monetary policy applied is based on global economic conditions, so we also include inflation factors and external factors such as central bank interest rates in developed countries, namely the United States. Based on what has been described, we determine the yield of government bonds as the study's

dependent variable. Meanwhile, the independent variable uses macroeconomic factors and the sentiment of fear.

Many studies on government bond yields have been carried out. These studies look at the impact of macroeconomic factors on the bond yield and yield curve. In this study, the macroeconomic factors used are Bank Indonesia's interest rate, growth of Gross Domestic Product (GDP), inflation rate, crude oil price, and The Federal Reserve's interest rate. These macroeconomic factors are the independent variables, along with the sentiment of fear caused by GFC and COVID-19.

Bank Indonesia defines the Bank Indonesia Interest Rate (BI Rate) as the monetary policy set by Bank Indonesia. Rising interest rates will cause investors to be more interested in saving their funds. As a result, the government was forced to increase the number of bonds offered. Usually, this increase in the supply of bonds is offset by their discounted price. Conversely, a decrease in interest rates will attract investors to buy government bonds. Preliminary research shows that there is an effect of movement in BI interest rates on yields, supporting the previous statement. Research conducted by Muharam, (2013), Paramita (2016), Sundoro (2018), and Santosa (2021) indicates that BI interest rates positively affect government bond yields.

Gross Domestic Product (GDP) is the market value of finished goods and services created in an economic system in a certain period. The general view of yields is that government debt and deficits affect government bond yields. Hsing (2015) research found that GDP growth had a negative effect. Research conducted by Akram and Das (2019) also found that in the long term a higher ratio of government debt to nominal GDP tends to reduce government bond yields.

The increase in commodity prices is often associated with inflation. Inflation tends to be a process of the increase, not the magnitude of price movements. Prices that have increased do not necessarily indicate inflation. Price movements will be called inflation if the

price increases occur continuously and, in the process, affect each other (Sukanto, 2009). research by Paramita (2016), Sundoro (2018), and Santosa (2021) found a positive effect on the inflation rate when viewed in the short term. This indicates that, in the short term, a reduction in inflation increases returns. However, if inflation persists for a long time, it will trigger a state reaction to increasing bond yields.

Crude oil prices refer to the spot price per barrel (159 liters) of crude oil which is commonly used as a benchmark for world oil prices. The US Energy Information Administration writes that the market value of individual crude oil flows reflects its quality characteristics. Research conducted by Manurung, et al (2013) found that the increase in crude oil prices affected bond yields. The price increase causes investors to be more interested in investing in bonds, and ultimately significantly affects bond yields. The same thing was also found by (Arshad, Muda, & Ismah, 2017), wherein the long term, there is a significant relationship between oil prices and Malaysian government bond yields. Research by Paramita (2016) found that Oil Price has a positive effect on the movement of 5-year government bond yields.

The United States is the country that has the largest economic growth rate today. This can be seen from the many investments made by investors, where the basis for making decisions will always reflect on the latest information about the economy in the United States. An example of the form of information that can best be used as a basis is the interest rate set by the Federal Reserve (Fed Rate). If the Feds decide to raise interest rates, investors are interested in investing in bonds in the United States, and this will reduce the number of funds that enter as investments in developing countries, including Indonesia. This is supported by research from Sundoro (2018) which finds that overseas bank interest rates have a negative impact on government bond yields.

The crisis-induced sentiment of fear refers to a sentiment of "fear" from a society that is driven by the uncertainty caused by a crisis. Research by (Bordon,

Schmid, & Schmidt, 2014) confirmed this relationship with the finding that wake-up calls caused by the financial crisis became the basis for determining bond prices. Andrieş et al. (2021) find that the higher number of cases and deaths and public health containment responses significantly increase uncertainty among investors in European government bonds. This resulted in an increase in government bond CDS spreads. Several studies related to sentiment of fear used the level of search for topics related to the crisis using Google Trends, such as research conducted by Paule-Vianez et al. (2021). Their research confirmed that fear caused by COVID is associated with an increased perception of a country's risk.

This study contributes to the literature in 3 ways. First, we added new research about the relationship between crisis-induced fear and the bond markets' productivity, especially COVID-19 related. This kind of study is limited to ASEAN countries' research, Indonesia included. Second, we provide new insights into financial studies. The usage of macroeconomic factors in bond market studies is very common in this kind of study, thus this study will provide other variables that also have roles in bond markets, which is the sentiment of fear. Third, we use the Indonesian Government Bond Yield in this literature, thus we also promote the usage of Government Bond in the portfolio, since the Indonesian Government nowadays encourages people to buy Bonds (ORI specifically).

RESEARCH METHOD

This study was conducted in Indonesia, one of the ASEAN countries. We realized that there's a shortage of literature that uses Pandemic concern as the variable that impacts the bond yields, especially in ASEAN countries. Indonesia was chosen because Indonesia is part of the G20 countries. This study will help to increase the amount of Bond Market literature related to the COVID-19 Pandemic in ASEAN countries, especially Indonesia. Documentation is conducted to obtain variable data, namely 10-year government bond

yields, BI interest rates, GDP growth values, crude oil prices, the Fed's interest rates, and the sentiment of fear caused by the crisis. All of these variables and their definition is shown in Table 1. All of these data are available on official websites that are trusted as sources of research data. The 10-year government bond yield variables, crude oil prices, and the Fed's interest rate are obtained through the website www.investing.com, the BI interest rate is obtained through www.bi.go.id, the GDP growth variable is obtained through the World Bank database website (www.worldbank.org), the inflation rate variable was obtained from the official website of the Central Statistics Agency (BPS) (www.bps.go.id), and the fear sentiment variable due to the crisis was obtained from Google Trends. Google Trends provides a free and publicly available query index that describes search volume as a number between zero and one hundred and enables data to be sorted by categories such as geographic location, activity, and others (Paule-Vianez et al., 2021). In this study, the 'search by the topic' was chosen, and the topic of the "2007 financial crisis" was selected from January 2007, while the topic of "COVID-19" was selected from March 2020. due to the fact that COVID-19

Table 1: Variable used in the study

Variables	Definition
10-Year Government Bond Yield (YIELD)	Indonesian Government Bond yield that received when the bond matures in 10 years
BI Rate (BI RATE)	The BI Interest Rate used is the interest rate per annum determined by Bank Indonesia.
GDP (GDP)	The growth of GDP per week.
Inflation (INF)	The inflation rate is measured using the growth of the Consumer Price Index.
Crude Oil (CRUDE)	World crude oil prices per week.
The Fed Rate (FEDS)	The interest rate per annum set by the Fed per week.
Sentiment of Fear (GFC and COVID)	Search rate of GFC-related information on Google Trends per week.

Source: Authors

started to spread in Indonesia at March 2020.

In order to get optimal results, all of time-series data were collected by taking weekly data for each variable. This is in order to achieve the value of n (data) suggested for this study. The basis for determining this amount of data is the study of (Schönbrodt & Perugini, 2013) which suggests a sample size ranging from 20 to 470. This measure adjusts the expected impact magnitude as well as the desired level of deviation. Researchers used the period from 2007-2010 for research during the Great Financial Crisis, and data from the period 2020 to February 2022 for the COVID-19 pandemic. After the data mining, the total data used in this research is 313 data, thus fulfilling the suggestion of Schönbrodt and Perugini (2013). The descriptive statistics for the variables in both crisis periods are shown at Table 2 and 3.

This study utilized the Vector Error Correction Model (VECM) method.

Table 2: Descriptive Statistics for GFC period's Variables

	Yield (Y)	BI Rate (BI RATE)	GDP Growth (GDP)	Inflation (INF)	Crude Oil (CRUDE) ($)	The Feds Rate (FEDS)	GFC Fear (GFC)
Count	208	208	208	208	208	208	208
Mean	0.202	0.148	0.111	0.017	78.67	0.018	4.74
Median	0.194	0.153	0.117	0.015	75.79	0.002	0
Mode	0.202	0.125	0.121	0.015	59.89	0.002	0
Minimum	0.138	0.125	0.088	0.006	33.87	0.001	0
Maximum	0.356	0.178	0.121	0.024	111.42	0.053	100
Standard Deviation	0.040	0.021	0.013	0.006	22.21	0.020	12.43

Source: World Bank, Bank Indonesia, BPS, Investing.com (Processed data)

Table 3: Descriptive Statistics for COVID-19 period's Variables

	Yield (Y)	BI Rate (BI RATE)	GDP Growth (GDP)	Inflation (INF)	Crude Oil (CRUDE) ($)	The Feds Rate (FEDS)	GFC Fear (GFC)
Count	105	105	105	105	105	105	105
Mean	0.128	0.073	0.027	0.437	57.07	0.099	13.8
Median	0.125	0.067	0.071	0.4	60.97	0.08	9
Mode	0.133	0.067	0.071	0.398	63.58	0.08	8
Minimum	0.114	0.067	-0.04	0.33	16.94	0.05	2
Maximum	0.156	0.087	0.098	0.74	115.68	1.1	100
Standard Deviation	0.010	0.007	0.057	0.105	20.02	0.141	14.64

Source: World Bank, Bank Indonesia, BPS, Investing.com (Processed data)

Andrei & Andrei (2015) in their research commented that if a set of variables is found to have one or more cointegration vectors, the appropriate estimation technique is the VECM method. This method adjusts for both short-term changes in the variables and deviations from equilibrium. The advantage of this method is that it can describe the long-term relationship for each variable, and can show the short-term relationship between these variables. VECM can be used if the data is fixed and there is a co-integration process along the way (Verbeek, 2014). For this reason, it is necessary to do a stationarity test, in order to show the validity of a measurement, which is important in time series data analysis. A series of observations is considered stationary if the process does not change over time. Visually, it can be seen from the flow of the resulting graph or plot. Data can be called stationary if the path extends to form a straight line. It can also be observed on the correlogram. If there is a decrease in the value of the first lag to the next lag quickly, then the time-series data can be said to be stationary. After changing the variables into the first differential (1st difference), the t-statistics values for all variables are greater than the critical values at each level. The probability value also shows a value that is smaller than the Alpha (α) value of 0.05. This shows that all variables are stationary at the 1st difference level.

After the stationary test, the test of the optimal lag criteria based on the Akaike Information Criterion (AIC) and Schwartz Criterion (SIC) approaches to determine the optimal lag length is conducted. The best lag length that used in the study is the one that has lowest AIC and SIC. Lag 1 is chosen due the Lag 1 is the smallest Lag that is optimal for both crises periods.

Cointegration test is conducted on the data in the first difference, in order to find out whether there is cointegration in the data (Abusharbeh, 2020). Cointegration testing is carried out using the Johansen cointegration test method. In both periods, it can be found that there are several equations at the that have cointegration at an alpha level of 0.05. This shows that this cointegration reflects a long-term adjustment mechanism (Andrei and Andrei, 2015), so that during both period the error-correction model is used. We also perform causality test using Granger Causality Test in order to determine whether there was a two-way relationship between the research variables. During Great Financial Crisis, one variable that has a two-way causal relationship with Indonesian Government Bond Yield (Y) is the CRUDE variable, namely the price of crude oil, with a note that this causal relationship is at the 90% confidence level. While the Bank Indonesia Interest Rate variable (BI RATE) has a two-way causal relationship with the yield of Indonesian government bonds (Y)

during COVID-19 periods. There are also some visible causality relationships, but the causality relationship is only one-way, such as the YIELD variable has a causal relationship to the GDP variable, but the GDP variable does not have a causal relationship to the YIELD variable. After both cointegration and causality test, the model of VECM is then built. For this study, this VECM models are proposed.

$$\boldsymbol{\Delta Yield_t = ECT_{t-n} + YIELD_{t-n} - BI\ RATE_{t-n} + GDP_{t-n} + INF_{t-n} + CRUDE_{t-n} + FEDS_{t-n} + GFC_{t-n} + C}$$

$$\boldsymbol{\Delta Yield_t = ECT_{t-n} + YIELD_{t-n} - BI\ RATE_{t-n} + GDP_{t-n} + INF_{t-n} + CRUDE_{t-n} + FEDS_{t-n} + COVID_{t-n} + C}$$

ECT is the long-run correction coefficient, and t-n represent the period of the optimum lag criteria.

RESULT AND DISCUSSION

Table 4 shows the Error Correction coefficients for all the variables in VECM models for Great Financial Crisis periods. This table explains the speed at which this model recovers from the disequilibrium caused by the disturbance. Looking at the value of t-statistics, BI RATE, INF, CRUDE and GFC variables have a significant correction coefficient, indicated by the t-statistics value greater than 2. In the VECM model at table 5, the Long-run Coefficient value shows a negative number. This indicates that this model will move towards an equilibrium condition. Then for the short-term coefficient interpretation for this model, only the prob. Value of the FEDS coefficient, namely the Feds interest rate, which is 0.018, is less than 0.05. Thus, the coefficient of this variable is significant. The value of -1.089 in the FEDS variable indicates that for every 1 addition point to the Feds interest rate, it will cause a reduction in the yield of Indonesian Government bonds by 1.089 points. Constant value, which is -0.000, indicates the intercept of this model. The Adjusted R-Square value of 0.017 indicates that this model can explain 1.7% of the value of the 10-Year Indonesian Government Bond Yield, while the remaining 98.3% is explained by other factors. Almost Identical result also happen during COVID-19 period's research. Table 6

Table 4. Table of Error Correction Coefficient for GFC Period Model

Error Correction	D(Y)	D(X1)	D(X2)	D(X3)	D(X4)	D(X5)	D(X6)
CointEq1	-0.006597	-0.002456	0.000147	-0.001048	0.042035	0.000788	0.593626
Std. Error	0.00397	0.00089	0.00120	0.00035	0.01093	0.00061	0.13696
t-Statistics	-1.66335	-2.76441	0.12233	-2.96652	3.84618	1.28992	4.33435

Data Source: Eviews
t-Statistics > 2

Table 5. VECM Coefficients for GFC period's Variables

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long-run Coefficient	-0.007	0.004	-1.663	0.098
Government Bond Yield (Y)	-0.011	0.070	-0.154	0.877
Bank Indonesia Rate (X1)	-0.383	0.355	-1.079	0.282
GDP Growth (X2)	0.039	0.253	0.155	0.877
Inflation (X3)	-0.061	0.964	-0.064	0.949
Crude oil (X4)	-0.018	0.024	-0.748	0.455
The Feds Rate(X5)	-1.089	0.456	-2.388	0.018
GFC Sentiment of Fear (X6)	-0.003	0.002	-1.510	0.133
Constant	-0.001	0.001	-0.764	0.446

Data Source: Eviews
Prob. < 0.05

shows the Error Correction coefficients for all the variables in VECM models for COVID-19 periods. Looking at the t-statistics value, the CRUDE, FEDS and COVID variables, have a significant correction coefficient, indicated by the t-statistics value greater than 2. The results of the VECM model can be seen in Table 7. The Long-run Coefficient value shows a positive number. This shows that this model tends to move away from the equilibrium condition. These results also indicate that other factors are needed that can move the model towards equilibrium.

Table 6. Table of Error Correction Coefficient for COVID-19 Period Model

Error Correction	D(Y)	D(X1)	D(X2)	D(X3)	D(X4)	D(X5)	D(X6)
CointEq1	0.003834	-0.000152	0.001537	-0.010722	-0.025700	-0.225147	0.252972
Std. Error	0.00067	0.00032	0.00365	0.00780	0.01020	0.00264	0.06757
t-Statistics	5.70651	-0.48262	0.42140	-1.37528	-2.52016	-85.2957	3.74375

Data Source: Eviews
t-Statistics > 2

Table 7. VECM Coefficients for COVID-19 period's Variables

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long-run	0.003	0.001	5.707	0.000

Coefficient				
Government Bond Yield (Y)	0.028	0.105	0.270	0.788
Bank Indonesia Rate (X1)	-0.278	0.231	-1.200	0.233
GDP Growth (X2)	0.008	0.019	0.414	0.680
Inflation (X3)	0.006	0.009	0.719	0.474
Crude oil (X4)	0.004	0.007	0.619	0.537
The Feds Rate(X5)	0.007	0.003	2.162	0.033
GFC Sentiment of Fear (X6)	0.001	0.001	1.472	0.144
Constant	-0.000	0.000	-0.573	0.568

Data Source: Eviews
Prob. < 0.05

Then for the interpretation of the short-term coefficients for this model, only the prob values. of the FEDS coefficient, namely the Feds interest rate, which is 0.033, which is smaller than 0.05. Thus, the coefficient of this variable is significant. The value of 0.007 in the FEDS variable indicates that for every 1 addition point to the Feds interest rate, it will cause an increase in the yield of Indonesian Government bonds by 0.007 points. Constant value, which is -0.000, indicates the intercept of this model. The Adjusted R-Square value of 0.344 shows that this model can explain 34.4% of the value of the 10-Year Indonesian Government Bond Yield, while the remaining 65.6% is explained by other factors.

The results of the study during the Great Financial Crisis period showed that the Feds interest rate had a negative impact on the 10-Year Indonesian Government Bond Yield, but research during the COVID-19 Pandemic period showed a positive, but not significant, effect on the 10-Year Indonesian Government bond yield. The negative effect found in the study of the Great Financial Crisis period is in accordance with what Sundoro (2018) found in his research. During that period, the United States of America was in a very serious crisis. This uncertain economic

condition caused investors at that time to choose to invest in other countries, especially developing countries which were considered not to be affected by this crisis. The Feds lowered interest rates to restore the United States' financial condition which was very slumped. This may be used by developing countries to increase their bond yields in order to attract foreign investors. In the period of the COVID-19 Pandemic, positive relations were caused by all countries in the world needing funds to recover their country's economy, so they increased their bond yields to be able to raise funds.

This study only produces 1 significant variable, namely the Feds Interest Rate variable, for both crises periods, while other variables' impact were not significant. Thus, almost all the hypotheses were rejected. This is quite surprising and not as expected, considering that many previous studies found significant results on similar research variables. As for the Great Financial Crisis period, this could be because how good the response from the Indonesian government regarding the crisis, and a lower ratio of Indonesia exports to Gross Domestic Product (GDP) during this period (Basri & Raharja, 2010). For the COVID-19 crisis, since the pandemic impact on all sector in Indonesian economic activity is so severe that the GDP growth is at the negative point, it could be the reason for the abnormal result. However, this could be also caused by the limitations of this study. There are two subtle things that could be the cause: 1) The amount of data that is still not sufficient to be able to provide significant results; 2) The variables selected in this study did not have a significant relationship with the dependent variable. The first could be mended by using daily data, but it can cause the difficulty to obtain daily data from Google Trend due to the data is weekly basis. This will be noted for the future study. Despite the unsatisfactory results, this research could provide benefits to those who want to decide what investments they want or need. If you look at the results obtained from previous studies, bond yields from the Government are indeed

affected by macroeconomic movements as well as sentiment caused by the crisis. However, looking at the r-square value of each VECM model in this study, it can be said that the research variables have not been able to explain the overall movement of bond yields in the two crisis periods. However, it should be noted that regardless of the macroeconomic conditions experienced by the Indonesian economy, the movement of bond yields will adjust, depending on the attitude and decisions taken by the Government in facing a crisis. Therefore, people who want to compile an investment portfolio can observe the current economic conditions. Government Bonds are risk-free investments because returns are guaranteed compared to other investments. People who do not want to take the risk of losing returns during a crisis can include Indonesian Government Bonds, such as SBN or ORI, in their portfolio.

CONCLUSION

As an investment tool to obtain funds or capital, bonds are used by both companies to obtain third party capital, as well as the government of a country to raise funds from the public for infrastructure development and economic activities. Bonds will provide returns to the holder in the form of yields. This yield can be observed its movement in a yield curve. Researchers have done a lot of research on the factors that influence the movement of bond yields, both issued by the government and companies. In the yield of bonds issued by the government, the country's macroeconomic factors are the most frequently studied variables. The addition of the sentiment of fear variable in this study aims to open a new perspective in research related to the movement of bond yields. This study uses the VECM (Vector Error Correction Model) method to obtain a long-term relationship on all research variables to the yield of 10-year Indonesian government bonds. This research is expected to contribute to research related to the bond market, especially in Indonesia.

After the research results and the two VECM models produced, it can be concluded that there's only 1 significant variable for each crises period, namely the Feds Interest Rate variable. Thus, almost all the hypotheses were rejected. Another thing that is emphasized from the results of the study is the Adjusted R-Square value of each VECM model in each crisis period. It was found that the GFC model has a value of 0.017 indicating this model can explain 1.7% of the value of the 10-Years Indonesian government bond yield, while the remaining 98.3% is explained by other factors. The COVID-19 model has an Adjusted R-Square value of 0.344, indicating that this model can explain 34.4% of the value of the Indonesian 10-Year Bond Yield, while the remaining 65.6% is explained by other factors. This value shows that the VECM model generated from this study has not been able to fully answer the movement of the 10-year Indonesian government bond yields during the GFC and COVID-19 crisis periods. significant relationship with the dependent variable.

The results of this study also suggest that despite the not significant result, Indonesian Government should not only set policies based on macroeconomic conditions, but also based on how investors (or the public) feel from the crisis and how they respond. Sentiment of fear variable can be interpreted directly as a concern about something, in this case is the impact of a crisis. High concerns will affect investment decisions from the public and investors. The government can establish policies that not only improve fiscal performance to deal with a crisis, but also must ensure the security of investment from investors from the impact of the crisis. Because Indonesian government bonds are considered as risk-free investments, the Indonesian government can increase the promotion of these government bonds.

Based on this result, suggestions can be also given for other researchers to carry out similar research in the future. Further research can add other variables. The added variables can be other macroeconomic factors, such as the price of gold, or it can also be other

factors from the bond market. The future research can use a longer period to get the amount of data that produces more significant result, such as daily data. It is also recommended for future research to use other methods besides VECM, such as the Panel Regression method which is able to find similar models in several sectors, such as ASEAN countries.

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