

Effect of Macroeconomic Indicators toward Government Bonds Price in the Secondary Market

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Abstract- This study aims to know price movement of government bond compared to some other investment instruments, and analyze the influence of macro-economic indicators (BI Rate, stock index, exchange rate and international indicators in this case is the US Treasury to government bond in the secondary market. Through panel regression and also ordinary least square method obtained several points in order to keep government bond prices remained stable on secondary market as follows : maintaining the stability of the rupiah exchange rate, keeping the spread of inflation rate with the bank rate, formulating the government policies that impact on people's purchasing power, BI Rate negatively affectsthe price of government bonds.

Index Terms- government bond, Fixed Rate Instrument, Panel RegressionMethod, Ordinary Least SquareMethod

I. INTRODUCTION

One of the alternatives taken by the government to fulfill the budget needs to run the state budget besides from tax-income and non-tax state income is by issuing Government Securities (SBN). In general, SBN can be divided into Government Bonds (Surat Utang Negara, SUN) and Sharia Government Bonds (Sertifikat Berharga Syariah Negara, SBSN) (IBPA, 2011). According to the Directorate General of Debt Management (Direktorat Jenderal Pengelolaan Utang, DJPU), by August 2015, the outstanding SUN rupiah of Indonesia Government reached Rp 1,220 trillion with each instrument outstanding of Zero Coupon of Rp 43.2 trillion, Fixed Rate of Rp 1,028 trillion and Variable Rate of Rp104 trillion. Until July 2015, there were 41 Fixed Rate Series in circulation on the secondary market, thus this instrument will be discussed further in this research. The issuance in each period tended to show an increase. However, by 2014 and 2015 they were likely to decline. If seen from coupon side, the Fixed Rate instrument on Primary Market tended to decline. However, in mid-2012 up to this moment, the coupon needed to be paid by the governments experienced an increase on each issuance.

In general, the State Securities are issued in the form of SPN and SUN, in which they are distinguished by the securities period. SPN is a SBN with less than one year period, while SUN is of more than one year period. In SUN issuance, the government can generate SUN product diversification into four types of instruments, i.e. Fix Rate, Variable Rate, Zero Coupon and ORI. On the primary market, the four instruments are traded

to the market at par price (100%) except Zero Coupon, and once they are sold in the primary market there will be securities price changes to be at premium or at discount.

The SUN price change in the secondary market is basically influenced by several macroeconomic indicators and it will be discussed further on what kind of impact does these macroeconomic indicators has caused and how big its impact towards the SUN price on secondary market.

II. RESEARCH METHODOLOGY

The method used in this research is panel regression and was equipped with the smallest squares method (Ordinary Least Square). According to Hsiao (2004) in Firdaus (2011), panel data can provide informative data, reduce colinierity among variables as well as increase the independent level which means it increases the efficiency..

The panel regression model used in this research is as follows:

$$FR_{it} = f(SBI, IHSG, ER, UT) \dots \dots \dots (1)$$

It was then formed in the Econometrics model with multiple linier regression equation:

$$FR_{it} = a + b_1 SBI_{it} + b_2 IHSG_{it} + b_3 ER_{it} + b_4 UT_{it} + \epsilon \dots \dots \dots (2)$$

In which: FR = Government Bonds/ Fixed Rate Instrument

a = Constanta

bi = Coefficient Regression

SBI= BI rate (%)

IHSG = IDX Composite

ER= Rupiah Exchange Rate (Rp/USD)

UT= US Treasury

ε = Error term

The OLS model that will be used is the Government Bonds that is used as dependent variable. The employed equation function is as follows:

$$FR = f(SBI, IHSG, ER, UT) \dots \dots \dots (1)$$

It was then formed in the Econometrics model with multiple linier regression equation:

$$FR = a + b_1 SBI_t + b_2 IHSG_t + b_3 ER_t + b_4 UT_t + \epsilon \dots \dots \dots (2)$$

In which: FR = Government Bonds/ Fixed Rate Instrument

a = Constanta

bi = Coefficient Regression
SBI= BI rate (%)
IHSG = IDX Composite
ER= Rupiah Exchange Rate (Rp/USD)
UT= US Treasury
ε = Error term

III. RESULTS AND DISCUSSIONS

The Influence of Macro Indicators towards Fixed Rate Instruments in the Secondary Market

Panel Model

The results of the panel data with Eviews for research model as presented in Table 1,

Table1. Effect of macroeconomic indicators on government bonds price in the secondary market.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IHSG	26.58	6.939561	3.830704	0.0002
ER	-37.84	9.817729	-3.854317	0.0002
SBI	-1.528	0.164194	-9.308324	0.0000
UST	1.44	0.255101	5.658952	0.0000
C	98.43	7.228741	13.61759	0.0000
AR(1)	0.864	0.013874	62.30528	0.0000

Based on the estimation result presented in Table 1, the result of the regression equation is formulated as follows:

$$FR_{it} = 98,43 - 1,53SBI_{it} + 26,58IHSG_{it} - 37,84ER_{it} + 1,44UT_{it} + \epsilon$$

Research results as shown in Table 1 can be interpreted as follows :

1. The Impact of BI Rates (SBI, Suku Bunga Acuan BI). It can be seen that based on the estimation results that the prob value is less than alpha 5% which means that SBI value shares a significant impact and the SBI coefficient variable shows a negative value of 1.53 which means that the SBI increase was able to significantly lower the bonds price to the FR of 1.53%, ceteris paribus. This is in accordance with the research conducted by M. K. Aswan Rambe in 2012 that measured and analyzed the influence of macroeconomic variables to the issuance of government bonds.
2. The Impact of IDX Composite (IHSG). Based on the estimation results, it is shown that the prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient shows a positive value of 26.58 which indicates that the increase of the IDX Composite value was able to significantly increase the bond prices towards FR of 26.58%, ceteris paribus.
3. The Exchange Rate (ER). Based on the estimation result it is shown that the prob value is less than alpha 5% which indicates that the exchange rate coefficient shows a negative value of 37.84 that indicates that the

strengthening of the US Dollar value or the weaken of the rupiah exchange rate was able to significantly lower the bond price towards FR of 37.84%, ceteris paribus.

4. The Impact of the U.S. Treasury (UST). Based on the estimation result it is shown that the prob value is less than alpha 5% which indicates that the U.S. Treasury shares a significant impact and US Treasury coefficient variable shows a positive value of 1.44 which indicates that the increase of the US Treasury value was able to significantly increase the bond prices towards FR of 1.44%, ceteris paribus.

On the research conducted by Suhaimi in 2011 it is shown that the Deposits Interest Rates Variable, the BI Rate and IDX Composite shares a significant impact towards ORI prices in the secondary market and it is in accordance with this research results. In addition, it is in accordance with the opinion addressed by Jogiyanto (2010), namely the relationship between the interest rate with bonds prices is negative, if the interest rates increase, then it will be more profitable to invest in bank deposits, thus the bonds prices in the market will decline.

The Selection of Panel Model

Chow test is used to select both models between Pooled Least Square and Fixed Effect Model. The hypothesis created in this testing are as follows:

- H0 : PLS Model
H1 : FEM Model

The Chow test result is presented as follows:

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.625205	(2,150)	0.0290
Cross-section Chi-square	7.505469	2	0.0235

Based on the test results on the table presented, it is shown that the prob value of (0.0235) < alpha 5% alpha indicates H0 rejection which means that the selected model is Fixed Effects Model.

The Statistical Test Result of OLS

The multiple regression results with Eviews for research model FR0053 is presented in Table 2.

Table 2. The Influence of macroeconomic indicators on FR0053 price in the secondary market.

Variabel	Coefficient	t-Statistic	Prob.
SBI	-0.02	-1.8068	0.0773
IHSG	0.23	4.1944	0.0001
ER	-0.31	-4.6155	0.0000
UT	0.92	4.9656	0.0000
C	0.38	2.5332	0.0148

The research results as presented on Table 2 can be interpreted as follows :

1. The BI Rates (SBI) Influence. Based on the estimation results it is shown that the prob value is smaller than 10% which indicates that SBI value shares a significant impact and SBI variable coefficient shows a negative value of 0.02 which indicates that the SBI increase was able to significantly lower the bond price towards FR0053 of 0.02%, ceteris paribus.
2. The IDX Composite Impact. Based on the estimation results it is shown that prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient shows a positive values of 0.23 which indicates that the IDX Composite increase was able to significantly increase the bond prices towards FR0053 of 0.23%, ceteris paribus.
3. The Exchange Rate (ER) Impact. Based on the estimation results it is shown that prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient

shows a positive values of 0.31 which indicates that the strengthening of US Dollar or the weaken of Rupiah exchange rate was able to significantly decline the bond prices towards FR0053 of 0.31%, ceteris paribus.

4. The US Treasury Impact. Based on the estimation result it is shown that prob value is less than alpha 5% which indicates that US Treasury shares a significant impact and the US Treasury coefficient shows a positive values of 0.92 which indicates that the US Treasury increase was able to significantly increase the bond prices towards FR0053 of 0.92%, ceteris paribus.

In the estimation result it is shown that the overall independent variables in the equation shows significant number at the level of $\alpha = 5\%$ except the SBI in which it shows a significant number of $\alpha = 10\%$. Based on the research model estimation as presented on Table 2, the estimation of the regression equation can be formulated as follows :

$$FR0053_t = 0,38 - 0,02SBI_t + 0,23IHSG_t - 0,31ER_t + 0,92UT_t$$

Multiple regression results with Eviews for research model FR0054 is presented on Table 3.

Table 3. The Influence of macroeconomic indicators on FR0054 price in the secondary market

Variabel	Coefficient	t-Statistic	Prob.
SBI	-0.03	-1.69	0.0973
IHSG	0.35	4.52	0.0000
ER	-0.30	-3.02	0.0041
UT	1.58	5.89	0.0000
C	0.36	2.34	0.0236

Research results as presented on Table 3 can be interpreted as follows :

1. The BI Rates (SBI) Influence. Based on the estimation results it is shown that the prob value is smaller than 10% which indicates that SBI value shares a significant impact and SBI variable coefficient shows a negative value of 0.03 which indicates that the SBI increase was able to significantly lower the bond price towards FR0053 of 0.03%, ceteris paribus.

2. The IDX Composite Impact. Based on the estimation results it is shown that prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient shows a positive values of 0.35 which indicates that the IDX Composite increase was able to significantly increase the bond prices towards FR0053 of 0.35%, ceteris paribus.

3. The Exchange Rate (ER) Impact. Based on the estimation results it is shown that prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient shows a positive values of 0.3 which indicates that the strengthening of US Dollar or the weaken of Rupiah exchange rate was able to significantly decline the bond prices towards FR0053 of 0.3%, ceteris paribus.
4. The US Treasury Impact. Based on the estimation result it is shown that prob value is less than alpha 5% which indicates that US Treasury shares a significant impact and the US Treasury coefficient shows a positive values of 1.58 which indicates that the US

Treasury increase was able to significantly increase the bond prices towards FR0053 of 1.58 %, ceteris paribus.

In the estimation result it is shown that the overall independent variables in the equation shows a significant number at the level of $\alpha = 5\%$ except the SBI in which it shows a significant number of $\alpha = 10\%$. Based on the research model estimation as presented on Table 3, the estimation of the regression equation can be formulated as follows :

$$FR0054_t = 0,36 - 0,03SBI_t + 0,35IHSG_t - 0,30ER_t + 1,58UT_t$$

 Multiple regression results with Eviews for research model FR0055 is presented on Table 4.

Table 4. The Influence of Macro Indicators towards FR0055 on the Secondary Market

Variabel	Koefisien	t-Statistic	Prob.
SBI	-0.02	-1.86	0.0682
IHSG	0.11	3.39	0.0014
ER	-0.12	-2.39	0.0210
UT	0.83	2.99	0.0043
C	0.77	6.48	0.0000

Research results as presented on Table 4 can be interpreted as follows:

1. The BI Rates (SBI) Influence. Based on the estimation results it is shown that the prob value is smaller than 10% which indicates that SBI value shares a significant impact and SBI variable coefficient shows a negative value of 0.02 which indicates that the SBI increase was able to significantly lower the bond price towards FR0055 of 0.02%, ceteris paribus.
2. The IDX Composite Impact. Based on the estimation results it is shown that prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient shows a positive values of 0.11 which indicates that the IDX Composite increase was able to significantly increase the bond prices towards FR0053 of 0.11%, ceteris paribus.
3. The Exchange Rate (ER) Impact. Based on the estimation results it is shown that prob value is less than alpha 5% which indicates that IDX Composite shares a significant impact and the IDX Composite coefficient shows a positive values of 0.12 which indicates that the strengthening of US Dollar or the weaken of Rupiah exchange rate was able to significantly decline the bond prices towards FR0053 of 0.12%, ceteris paribus.
4. The US Treasury Impact. Based on the estimation result it is shown that prob value is less than alpha 5% which indicates that US Treasury shares a significant impact and the US Treasury coefficient

shows a positive values of 0.83 which indicates that the US Treasury increase was able to significantly increase the bond prices towards FR0053 of 0.83%, ceteris paribus.

In the estimation result it is shown that the overall independent variables in the equation shows a significant number at the level of $\alpha = 5\%$ except the SBI in which it shows a significant number of $\alpha = 10\%$. Based on the research model estimation as presented on Table 4, the estimation of the regression equation can be formulated as follows :

$$FR0055_t = 0,77 - 0,02SBI_t + 0,11IHSG_t - 0,12ER_t + 0,83UT_t$$

Managerial Implications

The results showed that there was a significant positive influence of the IDX Composite variable towards the government bonds prices on the secondary market. This gives the understanding that the rise of IDX Composite tends to impact to the rise of the government bond. Therefore, it is important to continually accomplish the increase of IDX Composite by keeping the good business climate, for example by conducting investment promotions in the domestic and international capital markets. In addition, the government also needs to maintain political stability because it is the crucial point that becomes the investors' consideration before investing in Indonesia.

There are several points needed to be taken notice by the government so that Indonesia capital market does not show fluctuating movements. First, the rupiah exchange rates stability towards the currencies of other countries, especially the US dollar, is strongly influenced by the global conditions. Second, the range (spread) between inflation rates with the banking

interest rates that is too wide, whereas other countries apply negative spread by pushing the banking interest rates to spur its economic growth. Third is the government policy that shares a significant impact towards the purchasing power of the Indonesian society. If the purchasing power of the Indonesia improves, it indirectly shares a positive impact towards the issuers profit of Indonesia Stock Exchange, thus it will dampen the fluctuations of the movement of the IDX Composite.

In addition, this study also shows that there is a positive significant influence of the exchange rate variable against the government bonds price on the secondary market. Therefore, both the governments and Bank of Indonesia should be able to create policies that have an impact on Rupiah strengthening by, one of which, maintaining the society's purchasing power and keeping the inflation rate. Other things needed to be noted so that the government bonds prices does not experience a decline is by keeping the interest rate, in this case BI Rate. In another study, Ibrahim (2008) and Nasher (2011) stated that the Interest Rate (SBI) shares a positive impact towards Yield To Maturity in which it clarifies that it shares negative impact towards the price. The relationship between the interest rate with the bond price is negative and the relationship between the bonds prices with Yield To Maturity is also negative (Jogiyanto 2010).

This study also explains that the increase of the BI Rate will lead to the declining of government bond prices and there will be a tendency that the society is not interested with the bonds instruments and divert their investments to other instruments. BI Rate shares a negative impact towards the fixed rate of government bonds prices. This suggests that the higher the interest rates prevailing then many investors would prefer to invest their funds in the banking sector. Thus, it will cause the bonds prices in the capital market became down.

IV. CONCLUSIONS

Macroeconomic variables, in this case Composite Stock Price Index, Rupiah exchange rates, Bank of Indonesia interest rates and US Treasury share a significant impact towards the government bonds prices on the secondary market. Variables that share a positive impact towards the price changes in the secondary market is the Composite Stock Price Index and US Treasury, while variables that shares a negative impact towards the price changes on secondary market are the Exchange Rate and BI Rate. The government bonds issuance is one of the financing sources to close the budget deficit, thus the right

policies are needed so that the bond prices can be maintained. In addition, prior to the issuance, the government should still continue to do deep analysis on the development of macroeconomic indicators. This is in line with the results of the research that indicate that there is significant influence of macroeconomic indicators towards government bonds price changes in the secondary market.

REFERENCES

- [1] Bank Indonesia. 2014. Total Laporan Kebijakan Moneter Bank Indonesia. Jakarta (ID): Bank Indonesia.
- [2] Firdaus M. 2011. *Aplikasi Ekonometrika untuk Data Panel dan Time Series*. Bogor (ID): PT Penerbit IPB Press.
- [3] Ibrahim H. 2008. Pengaruh tingkat suku bunga, peringkat obligasi, ukuran perusahaan dan DER terhadap yield to maturity obligasi korporasi di BEI periode 2004-2006 [tesis].
- [4] Indonesia Bond Pricing Agency. 2012. *Introduction to Bonds Instruments & Market*. Jakarta: IBPA.
- [5] Jogiyanto H. 2010. *Teori Portofolio dan Analisis Investasi*. Ed ke-2. Yogyakarta (ID): BPFE.
- [6] Kementerian Keuangan. 2014. Statistik Utang Luar Negeri Indonesia. Jakarta (ID): Kementerian Keuangan Indonesia.
- [7] Suhaimi A. 2011. Analisis faktor-faktor yang mempengaruhi harga Obligasi Ritel Indonesia (ORI) [tesis]. Medan (ID): Universitas Sumatera Utara.
- [8] Surya, Nasher. 2011. Analisis pengaruh tingkat suku bunga SBI, exchange rate, ukuran perusahaan, debt to equity ratio dan bond rating terhadap yield obligasi korporasi di Indonesia. *Jurnal Manajemen Teknologi*. 10(2):124-137.
- [9] Rambe A. 2012. Analisa faktor-faktor ekonomi yang mempengaruhi penerbitan obligasi pemerintah [tesis]. Bogor (ID): Institut Pertanian Bogor.

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