The Indonesian Capital Market Review

Volume 13
Number 1 *January*

Article 5

1-30-2021

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Recommended Citation

Hartini, Eka Rathmanty Merry and Hanggraeni, Dewi (2021) "Determinant Factors of Liquidity Risk Premium on Indonesian Government Bonds," *The Indonesian Capital Market Review*: Vol. 13 : No. 1 , Article 5.
DOI: 10.21002/icmr.v13i1.13239
Available at: https://scholarhub.ui.ac.id/icmr/vol13/iss1/5

Indonesian Capital Market Review 13 (2021) 61-70

INDONESIAN
CAPITAL MARKET REVIEW

Determinant Factors of Liquidity Risk Premium on Indonesian Government Bonds

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(Received: August 2020 / Revised: January 2021 / Accepted: January 2021 / Available Online: January 2021)

This paper aims to find the determinant factors of the liquidity risk premium on the Indonesian government bonds. There are two liquidity risk premium proxies to be used, the difference of the yield to maturity and the theoretical-yield of the bonds, and the average bid-ask spread of the bonds. The research used the Random Effect panel-data to define the determinant factors of the liquidity risk premium. The result shows that the liquidity-risk premium of Indonesian government bonds is affected by the bond's characteristics and the financial market condition. The determinant factors are the bond's age, coupon rate, remaining life, issued amount, type (Sukuk or conventional), and market volatility. We expect this research will enrich the understanding of the liquidity risk on Indonesian government bonds; so that the authorities and the investors could use this in making their decisions.

Keywords: *Liquidity risk; Indonesian Government Bond; Risk Premium; Yield-Spread; Bid-ask spread.*

JEL Classification: G32, C22

Introduction

In March 2020, the yield on the benchmark U.S. 10-year Treasury touched an all-time low of 0.318% due to the pandemic COVID-19. As a result of the global central bank policy on lowering interest rates to support global growth, investors are looking for alternative investment instruments that provide higher yields (Belke, 2013). This condition leads investors to acquire emerging market government bonds that give higher yields than the developed market government bonds. This phenomenon has caused the inflow of foreign funds into Indonesia.

Another driving factor is that Indonesian government bonds have investment-grade, which is now rated BBB by S&P, Moody's, and Fitch rating agencies. These positive credit rating changes decrease the country's risk premium, which results in a lower bond risk premium (Cepni & Güney, 2019). Domestically, since 2016 the Indonesian Financial Services Authority requires the non-bank financial services intuitions, such as insurance and pension fund companies, to allocate at least 20% to 50% of the company investments in the Indonesian government securities (The Indonesian Financial Services Authority Regulation, 2016). We expect that the rising demand from external and domestic will affect the liquidity of Indonesian government bonds.

According to Kempf and Uhrig-Homburg

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(2000) and Fabozzi (2008), interest rate movements and bond liquidity affect the bond price. Djuranovik (2014), Gadanecz, Miyajima, and Shu (2018), Cepni and Güney (2019), and Eichler and Plaga (2020) carried out assessments of how fundamental or macroeconomic factors affected the emerging market, including Indonesia, government bonds price. However, discussion on how the bond liquidity affects the bond price is limited. This paper contributes to analyzing the liquidity risk of Indonesian government bonds and its determinant factors. Thus, investors could identify which Indonesian government bonds that have better liquidity in the market.

This paper analyzes the difference between the yield to maturity and the theoretical yield of the obligation (Díaz & Escribano, 2019) and the bid-ask spread (Gubareva, 2020) as proxies for the liquidity risk premium of bonds. Then we use a panel data regression model to define the determinant factors of the liquidity risk premium. The data characteristic and the result of the statistical tests suggested using the Random Effect panel data model. It shows that the liquidity risk premium of Indonesian government bonds is systematically related to the bonds' characteristics and the Indonesian financial market condition. The main determinant factors are the bond's age, coupon rate, remaining life, issued amount, and bond type (Sukuk or conventional), as well as Indonesian stock market volatility.

We organized the rest of the paper as follows. Section 2 provides a literature review of the studies looking into the liquidity risk premium in Indonesian government bonds. Section 3 discusses the research methodologies employed. Section 4 presents the results and provides a discussion on their interpretation. Section 5 concludes.

Literature Review

Liquidity is the ability of an asset to be transacted quickly and without a significant value impact (Fisher, 1959). Market liquidity is the ability to sell or buy assets at a short time, at a low cost, and with a minimum impact on the asset price (Castagna & Fede, 2013). A liquid asset can be sold at any time and immediately when the market opens with minimum loss and competitive price only if the financial market is deep, wide, and strong. The ability to offer an asset shortly is an essential factor for institutions when choosing an alternative source of funding.

Illiquid bonds have a higher yield than similar bonds that are more liquid (Elton & Green, 1998). A yield premium compensates for the difficulty of selling or buying a bond at a fair price. On the other hand, a liquid asset is traded with a premium on price compared to similar security with a lower degree of liquidity (Díaz & Escribano, 2019). In literature, liquidity risk is cost or premium that affects asset price positively by influencing investors in making decisions to allocate their assets to reduce transaction costs.

In the prior research, there are many proxies used to represent liquidity in a market term. Data availability determines proxies used to calculate the asset liquidity risk. The more detailed the available transaction data is, the more accurate the liquidity risk measurement will be. A liquidity risk measurement needs intraday data, including quoted and transacted price data of the bonds. Otherwise, we can use daily closing prices to approximate the risk premium (Díaz & Escribano, 2019).

Liquidity risk premium proxies

The additional yield due to liquidity risk is called the liquidity premium. This paper uses two liquidity premium proxies. For the first proxy, following Díaz and Escribano (2017), liquidity premium is the discrepancies between the yield-to-maturity (YTM) and its theoretical yield of a bond. The daily theoretical yield is related to the daily zero-coupon interest rate. In line with that, Goldreich, Hanke, and Nath (2005) stated that the liquidity risk premium is the difference between the bond yield and the yield of the on-the-run bond, which has similar maturity. Sarig and Warga (1989) explained that differences in the price of a bond originating from different data sources indicate the data

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DOI: 10.21002/icmr.v13i1.13239

error (noise) in one of the data sources. The illiquidity makes it difficult to set bond prices when selling or buying the bonds so that prices may differ.

For the second proxy, we used the average bid-ask spread. The spread is the difference between bid-yield and ask-yield compare to its mid-yield. It represents the sellers' or buyer's uncertainty about the actual price of the bond. This uncertainty creates a higher error margin (Sarig & Warga, 1989). Amihud and Mendelson (1986) and Gubareva (2020) also used this proxy in their research.

Liquidity risk factors

Previous research shows that the liquidity risk premium of a bond determined by several factors, namely the amount of bond issued (Fisher, 1959; Jopp, 2020), the bond age, and the type of issuance (Jopp, 2020; Sarig & Warga, 1989; Warga, 1992), the remaining life (Amihud & Mendelson, 1991), and investor risk appetite (Longstaff, 2002). This paper analyzes six liquidity risk factors as follow:

1. Amount issued

The amount issued means the number of bonds issued and traded in the market. The higher the available amount of bonds for trading is, the easier for investors to obtain the bonds. The use of amount issued as liquidity risk factor has been proven by Fisher (1959), Jankowitsch, Mösenbacher, and Pichler (2006), Nashikkar, Subrahmanyam, and Mahanti (2011), Díaz and Escribano (2017), and Petrella and Resti (2017).

2. Age

The bond age is the period since the bond is issued. Amihud and Mendelson (1991) state that the bond liquidity tends to decrease with the increasing age of the bond. Over time, the investor will put the bonds into a passive portfolio that caused the bonds will be illiquid until maturity. Similarly, Sarig and Warga (1989) state that newly issued (on-the-run) bonds are the most liquid bonds, and their age is the determinant factor of bond liquidity.

3. Remaining life

The remaining life is the period to the maturity of a bond. Investors tend to hold bonds with short maturity periods rather than those with long maturity periods (Sarig & Warga, 1989). It is because longer tenor bonds have higher uncertainty market prices due to the interest rate movements.

4. Coupon rate

According to Díaz and Escribano (2017), the coupon rate affects the liquidity of the US Treasury bonds. The higher the coupon rate is, the higher the tax paid by investors. Thus, investors prefer to hold a lower coupon rate bond than a higher coupon rate that gives a similar yield.

5. Type (Sukuk or conventional)

According to Nanaeva (2010), Sukuk bonds have lower liquidity than conventional bonds. It is due to the preference of Sukuk holders to hold these bonds until maturity. Some sharia people are prohibited trades the debt on the secondary market if the price is different from its nominal value. Additionally, certain types of Sukuk issuance, such as Istisnaa, are prohibited traded on the secondary market.

6. Financial market condition

Based on Kempf, Korn, and Uhrig-Homburg (2012), the financial market condition affects the investors' need to transact. When much information is circulating in the market, volatility will increase, encouraging investors to adjust their portfolios. Investors' investment strategies affect the stock market and the bond market simultaneously. We illustrated the financial market condition by the volatility of the stock market. Similarly, Bao, Pan, and Wang (2011) also state that liquidity decreases during a crisis.

Data and period

The objects of this research are the Indonesian government conventional and Sukuk bonds that outstanding from 2005 to 2019. We select the period by considering the data availability and covering the global financial crisis period from 2007 to 2008, which impacted the Indonesian financial market. In this research, we focus on the Rupiah bonds issued by the Ministry of Finance of Republic Indonesia that the

public could trade in the primary and secondary markets. We exclude bonds in foreign currencies, bonds issued through private placement, government recap bonds, bonds issued by Bank Indonesia, and bonds not traded in the secondary market. The study also excluded bonds with less than 1-year tenor due to the increasing price volatility near the bond's maturity.

The data used in this research were bond's daily bid-yield, ask-yield, and mid-yield. We also used the bond's characteristics data, such as the type of bond (conventional or Sukuk), the coupon rate, the issue date, the maturity date, and the amount issued. To calculate the theoretical yield, we used the zero-coupon yield index of 1-year, 2-year, 3-year, 4-years, 5-year, 6-year, 7-year, 8-year, 9-year, 10-year, 15-year, 20-year, and 30-year. We used the Indonesian stock index price (JCI Index) volatility as the financial market condition factor. We collected All of the data from Bloomberg.

Research Methods

This section describes the methodology used to analyze the liquidity risk premium of Indonesian government bonds. We calculated the proxies of the bond's liquidity risk premium before calculated the liquidity risk factors. Then, we defined the relationship of the liquidity risk premium proxies with the liquidity risk factors.

Liquidity risk premium proxies

We approached the liquidity risk premiums by calculating the difference between yield-to-maturity (YTM) and the theoretical yield (Díaz & Escribano, 2017). YTM is the rate-of-return on investment if we hold a bond until maturity and we reinvested all received payments at the same rate. For the theoretical-yield calculation, we used the zero-coupon yield curve of a similar tenor Indonesian government bond. The Indonesian government's zero-coupon yield curve involves the Indonesian benchmark bonds determined by the Ministry of Finance. The benchmark bonds are the on-the-run bonds. To calculate the liquidity risk premium or called yield spread, we used the model as follow:

$$YieldSpread_{i,t} = \frac{|\, y_{i,t} - ty_{i,t} \,|}{ty_{i,t}} \quad (1)$$

where $YieldSpread_{i,t}$ is the yield spread of i-bond and t-time, $y_{i,t}$ is the mid yield of i-bond and t-time and is $ty_{i,t}$ is the theoretical yield of i-bond and t-time.

For the second proxy, we used the average bid-ask spread that described the difference between the bond's selling yield and the purchasing yield. The narrower spread indicates the tighter market (Karstanje, Sojli, Tham, & Van der Wel, 2013) and the thinner the liquidity risk premium. We used the average bid-ask spread formula as follow:

$$BidAsk_{i,t} = \frac{y_{i,t}^{ask} - y_{i,t}^{bid}}{y_{i,t}} \quad (2)$$

where $BidAsk_{i,t}$ is the average bid-ask spread of i-bond and t-time, $y_{i,t}$ is the mid yield of i-bond and t-time, $y_{i,t}^{ask}$ is the ask yield of i-bond and t-time, and $y_{i,t}^{bid}$ is the bid yield of i-bond and t-time.

Liquidity risk factors

Liquidity risk factors consist of the bond's characteristics and financial market conditions. We employed six variables for bond characteristics: amount issued, age, coupon rate, remaining life, type, and financial market condition.

The issued amount is a characteristic of a bond that is static from the bond issuance until maturity. Since the value is relatively large, we used the natural logarithm value of the Issued Amount value in this study. Jankowitsch et al. (2011), Nashikkar et al. (2011), and Petrella and Resti (2017) also used the logarithm form in their study.

The bond age is how long a bond has been issued expressed in a percentage of the original term maturity, so the age is between 0 and 1. Diaz and Escribano (2019) also used the bond age in the percentage form in their study.

$$BondAge = \frac{Position\ Date - Issue\ Date}{Maturity\ Date - Issue\ Date} \quad (3)$$

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DOI: 10.21002/icmr.v13i1.13239

Table 1. Statistic Description

Variables	*Obs*	*Mean*	*Std. Dev*	*Min*	*Max*
YieldSpread	158,340	0.0473	0.0439	0.0009	0.2551
BidAsk	158,340	0.0186	0.0188	0.0018	0.1107
RemainingLife	158,340	9.9564	7.1700	1.1068	29.0575
Coupon	158,340	9.4157	2.4131	0	15.0000
Dummy_Sukuk	158,340	0.2181	0.4130	0	1
lnAmountIssued	158,340	30.2082	1.2817	26.2527	32.5396
BondAge	158,340	0.3423	0.2326	0.0069	0.8697
Vol_Eq	158,340	0.0105	0.0057	0.0037	0.0353

Table 2. Result of the YieldSpread model multicollinearity test

Variables	*YieldSpread*	*Remaining Life*	*Coupon*	*Dummy_Sukuk*	*lnAmount Issued*	*BondAge*	*Vol_Eq*
YieldSpread	1,00						
RemainingLife	0,35	1,00					
Coupon	-0,02	-0,02	1,00				
Dummy_Sukuk	0,13	-0,08	-0,20	1,00			
lnAmountIssued	-0,11	0,20	-0,32	-0,36	1,00		
BondAge	-0,30	-0,65	0,19	-0,05	-0,18	1,00	
Vol_Eq	0,15	-0,01	0,12	-0,12	-0,15	-0,12	1,00

The coupon rate is the rate of interest paid periodically by bond issuers on the bond's face value. The coupon rate is also a characteristic of bonds that is static from issuance to maturity.

The remaining life is the remaining period of a bond until it matures. It stated in years. As time passes, the remaining life moves from its initial tenor to zero.

$$RemainingLife = \frac{Maturity\ Date - Position\ Date}{365} \quad (4)$$

Bond type is a dummy variable to identify whether the bond is a conventional bond or Sukuk. The type variable takes the value of "0" for conventional and the value of "1" for Sukuk. Type is also a static characteristic of a bond.

We used the standard deviation of 30 days JCI Index daily return for the financial market condition variable.

Multiple linear regression

To determine the best panel data model to be used, we did the Chow Test, the Hausman Test, and the Lagrange Multiplier Test. The tests concluded that the Fixed Effect Model is the best. Meanwhile, in this research, there are three time-invariant variables of the bond characteristics that are unchanged along the time. They are coupon rate, bond type, and amount issued. According to Gujarati and Porter (2009) and Baltagi (2008), the Fixed Effect Model cannot identify the impact of time-invariant variables even though the variables are relevant. Thus, the Fixed Effect model is not the best model for this regression.

Based on the Lagrange Multiplier Test, the Random Effect Model was more suitable to be used than the Least Squared Panel Model. The Random Effect Model assumed that the entity distribution was random and uncorrelated to the independent variables. This model could also accept time-invariant variables. Thus, we applied the Random Effect panel data model to explain the liquidity proxies by the bond's characteristics and market volatility. Meanwhile, we carried out the regression process using STATA.

Results and Discussion

This research used regression analysis to run two dependent and six independent variables. The dependent variables are YieldSpread and BidAsk, which represent the liquidity risk premium proxies. The six independent variables are RemainingLife, Coupon, Dummy_Sukuk, lnAmountIssued, BondAge, and Vol_Eq. The independent variables represent the liquidity factors. We summarized the descriptive statis-

Table 3. Result of the *BidAsk* model multicollinearity test

Variables	*BidAsk*	*Remaining Life*	*Coupon*	*Dummy_ Sukuk*	*lnAmount Issued*	*BondAge*	*Vol_Eq*
BidAsk	1,00						
RemainingLife	-0,45	1,00					
Coupon	-0,10	-0,02	1,00				
Dummy_Sukuk	0,20	-0,08	-0,20	1,00			
lnAmountIssued	-0,22	0,20	-0,32	-0,36	1,00		
BondAge	0,46	-0,65	0,19	-0,05	-0,18	1,00	
Vol_Eq	0,00	-0,01	0,12	-0,12	-0,15	-0,12	1,00

Table 4. Result of the Chow test

Chow Test	*F Test*	*Prob > F*
YieldSpread Eq	340.29	0.0000
BidAsk Eq	1056.33	0.0000

Table 5. Result of the Hausman test

Hausman Test	*Chi2*	*Prob > chi2*
YieldSpread Eq	3966.15	0.0000
BidAsk Eq	1031.12	0.0000

Table 6. Result of the LM test

LM Test	*Chibar2*	*Prob > chibar2*
YieldSpread Eq	2.4e+05	0.0000
BidAsk Eq	3.6e+06	0.0000

tics of the variables used in Table 1.

Based on the calculation, we found that the average yield spread was 4.73% of the bond's yield, and the average bid-ask spread was 1.86% of the yield. They imply that the liquidity risk defines less than 5% of the Indonesian government bond yield, while other factors such as macroeconomics, credit risk, and market risk represent more than 95% of the Indonesian government bond yield.

Before running the regression, first, we checked the correlation among the variables used in this research. Based on the multicollinearity test result (Table 2 and Table 3), there was no correlation among variables that exceeded 0.75. It means that there is no multicollinearity problem in these models (Gujarati & Porter, 2009).

We performed different tests to decide which model is more appropriate: Chow Test, Hausman Test, and Lagrange Multiplier Test.

Chow Test

H0: Common-effects (p.value > 0.05)
H1: Fixed-effects (p.value > 0.05)

From the above output, the null hypothesis is rejected, then the alternative hypothesis that we will choose the fixed-effect model is accepted.

Hausman Test

H0: Random-effects (errors are not correlated with regressors)
H1: Fixed-effects (errors are correlated with regressors)

The probability obtained from the Hausman-Test is less than 0.05, which means that the alternative hypothesis is accepted, so the model used will be the one with fixed effects.

Taking into account the two tests, we will use for our analysis the model with fixed-effects. Meanwhile, according to Gujarati and Porter (2009) and Baltagi (2008), the fixed-effects model cannot identify the impact of time-invariant variables even though the variable is relevant. There are three time-invariant variables of the bond's characteristics in the model: coupon rate, bond type, and amount issued. Thus, we cannot use the fixed-effect model for this regression.

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DOI: 10.21002/icmr.v13i1.13239

Table 7. Results of the regression models

Variables	*YieldSpread 2005-2019 (1)*	*BidAsk 2005-2019 (2)*	*YieldSpread 2005-2009 (3)*	*YieldSpread 2010-2014 (4)*	*YieldSpread 2015-2019 (5)*
RemainingLife	0.0110***	0.0042***	0.0075***	0.0074***	0.0075***
	(0.0001)	(0.0000)	(0,0003)	(0.0002)	(0.0001)
Coupon	-0.0047***	-0.0032***	-0.0023***	-0.0051***	-0.0024***
	(0.0004)	(0.0004)	(0.0006)	(0.0007)	(0.0008)
Dummy_Sukuk	0.0255***	0.0142***	0.0543	0.0078*	0.0376***
	(0.0024)	(0.0022)	(0.0094)	(0.0016)	(0.0031)
lnAmountIssued	-0.0163***	-0.0062***	-0.0082***	-0.0112***	-0.0047***
	(0.0009)	(0.0008)	(0.0030)	(0.0016)	(0.0012)
BondAge	0.0761***	0.0873***	0.0407	0.0319***	0.0484***
	(0.0010)	(0.0004)	(0.0033)	(0.0023)	(0.0018)
Vol_Eq	0.4304***	0.0510***	0.1378***	0.4766***	0.2180***
	(0.0179)	(0.0060)	(0.0285)	(0.0328)	(0.0344)
Constant	0.4510***	0.1691***	0.2471***	0.3504***	0.1002**
	(0.0285)	(0.0262)	(0.0873)	(0.0521)	(0.0416)
Obs	158,340	158,340	30,415	60,869	67,056
Prob>chi2	0.0000	0.0000	0.0000	0.0000	0.0000
R-sq within	0.2240	0.3302	0.0213	0.0449	0.0894
R-sq between	0.2646	0.0449	0.8244	0.6137	0.1638
R-sq overall	0.1436	0.0004	0.3690	0.2007	0.0999

*=signification level 10%, **=signification level 5%, ***=signification level 1%
The standard errors are presented in parentheses.

Lagrange Multiplier (LM)Test

H0: Least Squared Panel
H1: Random-effects

The probability obtained from the LM test is less than 0.05, which means that the alternative hypothesis is accepted, so the model used will be the one with random effects. Then, we regressed the model of YieldSpread and BidAsk using the Random Effect panel data model.

Based on the test results above (columns (1) and (2)), we founded that the Prob>chi2 value was 0.00 for both models. It indicates that all independent variables used in the regression model simultaneously influence the dependent variables. Meanwhile, on the partial-significant test, we founded that P>|z| was 0.00 for all variables. It means that all dependent variables have significant effects on the independent variables. Based on the model goodness of fit, the coefficient of determination or R-sq of the YieldSpread model was higher than the R-sq of the BidAsk model. It means the independent variables can predict the YieldSpread better than the BidAsk.

For the robustness check, we use alternative liquidity proxies and three sub-samples. This paper shows that the six independent variables have a similar relationship with the YieldSpread (column (1)) and the BidAsk (column (2)). The consistency of the independent variables with the two alternative liquidity risk proxies shows the model's robustness. We also could see that in 3 sub-sample periods, columns (3), (4), and (5), the six independent variables have a similar relationship with the YieldSpread. Here, the six liquidity risk factors could explain the liquidity risk premium of Indonesian government bonds.

Based on the "R-sq within" for the YieldSpread equation, the independent variables could explain 22.4% of the variation of YieldSpread within the security group. While in the BidAsk equation, the independent variables could explain 33.02% of the BidAsk variation within the security group. Based on the "R-sq between" in the YieldSpread model, the independent variables could explain 26.46% of the dependent variable variation between the security groups. While in the BidAsk model, the independent variables only could explain 4.49% of the YieldSpread between the security groups. Since the "R-sq overall" computes the fitted values using the predicted value and the original value, not the average value, then the "R-sq overall" is smaller than the "R-sq within" and the "R-sq between". For the YieldSpread equation, the "R-sq overall" is 14.36% means the

independent variables could explain 14.36% of the variation of YieldSpread's original value. While in the BidAsk model, the "R-sq overall" is close to zero, which means the predicted value variation is not fit with the original value.

The results found that five independent variables had the same relationship with the liquidity risk premium, as stated in the previous studies. However, there was a variable that showed a different result. It means that the liquidity risk premium of the Indonesian government bond not similar to other government bonds.

The remaining life has a significant positive effect on the liquidity risk premium of Indonesian government bonds. It indicates that the liquidity risk of the bonds that have longer remaining life is higher than the shorter ones. The investors' tendency to hold short-term bonds is also in line with the lower market risk (duration) and credit risk (default probability) in the short-term bonds compared to the longer-term bonds. The longer the bond's remaining life is, the more probable the bond's price will decrease due to rising market interest rates, and the more probable the issuer cannot pay its obligation. The relationship between remaining life and liquidity risk in this model is consistent with the prior research conducted by Sarig and Warga (1989).

The coupon rate has a significant negative impact on the liquidity risk premium of Indonesian government bonds. It suggests that high coupon bonds are easier transacted than lower coupon bonds. This result is not in line with the initial hypothesis that estimated that the coupon rate was positively related to the liquidity risk, following Bao et al. (2011) which states that coupon rates are positively related to liquidity risk premiums due to tax impact. In Indonesia, the income-tax rate for any coupon rate is 20%; hence, it does not affect investors' preferences in choosing lower coupons. We also analyzed that Indonesian government bond investors tend to buy bonds with high yield or coupon to yield higher regular income streams. Thus, the Indonesian government bonds with a high coupon rate are more liquid.

The amount issued has a significant negative relationship with the liquidity risk premium of Indonesian government bonds. It indicates that the more issued amount by the Indonesian government, the more likely the transactions on these bonds conducted. This result is in line with Fisher (1959) and Petrella and Resti (2017).

The age of bonds has a significant positive relationship with the liquidity risk premium of Indonesian government bonds. It suggests that the longer a bond is already issued, the more illiquid the bonds transacted. The longer a bond in the financial market, the more likely it is embedded in an investment portfolio. This result is in line with Díaz and Escribano (2017), who stated that the recently issued bonds are more liquid than the older ones.

The Dummy Sukuk variable has a significant positive relationship with the yield-spread and average bid-ask spread. It means that the Sukuk bonds have a higher liquidity risk premium than conventional bonds. It is related to the Sukuk investor's characteristics that tend to hold the bonds to maturity compared to the conventional-bond investors who are more speculative (Nanaeva, 2010).

The market volatility had a significant positive relationship with yield spread and average bid-ask. It means that when stock market volatility increases, the yield spread of Indonesian government bonds widens. In times of crisis, investors will tend to shift to safer assets (flight to quality). For global investors, Indonesian government bonds are risky assets. Therefore, in times of crisis, foreign investors will release their Indonesian bonds caused an imbalance in the supply and demand of Indonesian government bonds. It leads to the instability of bond prices. Meanwhile, for local investors, government bonds are risk-free instruments, but, in times of crisis, they tend to reduce their risk exposure by turning their assets into cash to avoid the probability of price declining.

The constant in the YieldSpread and the BidAsk equations are positive numbers. They estimate the dependent variable is positive when all independent variables equal zero. A significant p-value for the constant indicates that we have sufficient evidence to conclude that the constant does not equal zero.

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DOI: 10.21002/icmr.v13i1.13239

Conclusion

Based on this research, we found that the liquidity risk defines less than 5% of the Indonesian government bond yield, while other factors such as macroeconomics, credit risk, and market risk define more than 95% of it. The bond characteristics and financial market conditions affect the liquidity risk premium of Indonesian government bonds. The determinant factors are the remaining life, the coupon rate, the type of bonds (Sukuk or conventional), the amount-issued, the bond-age, and the Indonesian stock index (JCI) volatility. The issued amount and the coupon rate negatively affect the bond liquidity risk premium, while the remaining life and bond-age have positive relationships with the liquidity risk premium. The Sukuk bonds have a higher liquidity risk than conventional bonds. In volatile market conditions, the liquidity risk premium of Indonesian government bonds increases.

Investors can opt for bonds to buy, considering the factors affecting the liquidity risk inherent in bonds. Investors should acquire liquid bonds so could be sold at a reasonable price at any time. Bonds with lower liquidity risk are the bonds that have small remaining-life, high coupon-rate, categorized as conventional bonds, issued in large quantities, and recently issued (low bond-age). Meanwhile, if the investors intend to acquire bonds to hold them to maturity, then liquidity risk does not need to be a primary consideration. Even by having illiquid bonds, investors will get higher yields (lower prices) as compensation for the risks inherent in these bonds.

By the result of this study, the Ministry of Finance will have another consideration in determining the characteristics of bonds be issued to maintain the liquidity risk on the Indonesian government bond market. Similarly, Bank Indonesia, which uses government bonds for monetary operations, will have another consideration in opting for bonds bought or sold to support the bond market's liquidity.

However, this research leaves some limitations for future works. First, this research only used two proxies of the liquidity premium, the yield-spread and the bid-ask spread. Meanwhile, according to previous studies, other proxies can be used, such as the transaction's volume and price changes caused by a transaction. Second, this research only covers the Indonesian government bonds denominated in Rupiah. Furthermore, the liquidity risk of Indonesian foreign-currency government bonds and Indonesian corporate bonds could be explored.

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https://scholarhub.ui.ac.id/icmr/vol13/iss1/5
DOI: 10.21002/icmr.v13i1.13239