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The Impact of Information Transmission and Liquidity toward Indonesian Corporate Bond Yield Spread

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ABSTRACT

This research aims to investigate whether information risk and liquidity become yield spread determinants of Indonesian corporate bond market. This study uses market microstructure approach. Previous research had revealed the impact of Volatility Model or the information effect on transaction (Balduzi et al., 1999; Brandt & Kavajecz, 2004; Green, 2004) and the sequential trade models used by Easley et al. (2002). In this research, information risk is measured by Probability of Informed Trading (PIN) model, liquidity is measured using Lesmond-Ogden-Trzcinka (LOT) model, and the Pastor and Stambaugh model is used to measure systematic liquidity risk. Using intraday transaction data of Indonesian corporate bonds during 2006-2011, all three main variables were found to influence Indonesian corporate bond yield spread. The average PIN of Indonesian corporate bonds is 7.98%, which is lower than that of the US market. The average LOT for the Indonesian corporate bond is 310 bps, which is less than that of the US market, and investor demand of illiquid bonds is more sensitive to systematic liquidity than liquid bonds.

Keywords: Indonesian corporate bond, information risk, Probability of Informed Trading, systematic liquidity, yield spread

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INTRODUCTION

Asset pricing of corporate bonds is not only influenced by default factors but also by non-default ones. Initially, experts stated that the risk derived from a corporation's bonds is from the risk of default only (Collin-Dufresne, Goldstein, & Martin, 2001; Huang & Huang, 2003), which means the higher the risk of default of a corporate

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bond, the higher the yield and the cheaper the bond prices. However, subsequent research proves that the asset pricing of a corporate bond is also influenced by factors other than the risk of default (Chen, Lesmond, & Wei, 2007). These factors are classified as non-default risk. Among the dominant non-default factors is liquidity risk (Duffie & Singleton, 1999). O'Hara (2003), Easley, Kiefer and O'Hara (1996a) explain some determinants of yield spreads in the market, namely inventory (liquidity), market power and information-based factors. In addition to liquidity, Easley et al. (1996a) suspect that information risk is a non-default factor affecting asset pricing of securities in the market. Information risk is defined as the risk of error in setting the price and direction of the order faced by the market maker, because informed traders have private information that the market maker does not have (Easley, Kiefer, & O'Hara, 2002; Paperman, 1996b). When an informed trader places orders, the market faces great risk of loss if the trader is wrong in setting prices (Li, Wang, Wu, & He, 2009). In addition, there is empirical evidence that rare bonds of transactions tend to have greater price variability (Alexander, Edwards, & Ferry, 2000).

Information risk faced by the market maker in every transaction in the bond market differs, depending on the perception and interpretation of the informed trader on the impact of market information disclosure on the price of the bond (Green, 2004). As a buffer of liquidity in the market, market makers often must absorb information risk and then convert it into price and direction of transactions, either to informed traders who place orders based on information or to uninformed merchants whose orders are based on liquidity factors (Easley et al., 1996a). It was initially difficult to sort out non-default factors consisting of liquidity and other factors, including information risk (Easley et al., 2002). However, various structural models have been constructed to sort out the effects of information, as Green (2004) did via structural models and Easley et al. (1996a, 1996b, 2002) did with the Probability of Informed Trading (PIN) model. In parallel, the theoretical models of Easley and O'Hara (1987) were developed by Easley et al. (1996a), Easley et al. (1996b), and Easley et al. (2002). This theoretical model is known as the Probability of Informed Trading (PIN), which is a structural model that measures the risk of disclosure of information. The PIN is a ratio of the portion of arrival of informed trader to the total arrival of the order faced by the market maker. The researchers developed the theoretical model based on assumption of adverse selection of informed and uninformed traders arising from the asymmetric information in the market. This asymmetric information is caused not only by the unevenness or prevalence of public information dissemination in the market, but also by uneven analysis and prediction ability of market participants as the basis for responding to information in the flow of orders and prices they set (Brandt & Kavajecz, 2004; Green, 2004). As a measure, the PIN can be empirically applicable to the ITC (order driven and continuous auction) stock market as shown by Easley et al. (1996a, 1996b, 2002) and on the government bond market in the United States as conducted by Li et al. (2009), who explain that PINs are derived from microstructure models that focus on individual securities and are estimated from transaction data from individual securities. Therefore, the PIN can be used to measure risk information both in the stock market and bond market. Furthermore, the PIN represents risks of securities-specific information. By observing the flow of investor orders, dealers know the intentions of their customers that provide valuable information to predict the next short-term price movement, although the transaction does not provide any fundamental information about the value of the securities being traded (Li et al., 2009). In addition, bond transactions are over the counter (OTC), making bond transactions more vulnerable to opposing information. Li et al. (2009) assert that the PIN is a neutral measure and can be used for various securities, such as stocks and government bonds, as long as the information on the microstructure of the transactions is known; i.e., the direction and size of the order flow. Based on the results of the literature review, it is clear researchers have not studied the measurement of information risk and its effect on the yield spread on intraday data on corporate bonds in Indonesia. Non-default determinants of empirical studies on the yield spread of corporate bonds are still focused on liquidity factors and have not considered any information risk whose existence affects the pricing of securities (Chen et al., 2007; Easley et al., 2002; Li et al., 2009). As an additional analysis, the present study will test the relationship of yield spread to country risk, systematic market liquidity risk whose existence affects bond yields (Alquist, 2010; Pastor & Stambaugh, 2003), certain bond-specific characteristics (i.e., maturity and amount of bonds outstanding), and the characteristics of bond transactions (i.e., transaction volume, price variability, transaction frequency, and bid-ask spread). All of these factors are indicators (or determinants) of liquidity required to assess yield spreads.

LITERATURE REVIEW

The Role of Information on Price Determination

When traders have inside information, they do not need to revise their beliefs regarding asset values from time t-1 to t when new information comes to market (Madhavan, 2000). Conversely, when new information comes along and traders do not have that information beforehand, their confidence revisions will be reflected in the order flow sign. Informed traders will buy when the price is below fair value and sell when the price is above its fair value. On large orders, asymmetric information causes the actual cost of the transaction to exceed half of the bid ask spread. Transaction costs are economically significant because large transactions will shift prices. In the market microstructure, the market maker will buy or sell securities on demand. Because market makers take a central position and become price makers, market makers are often used as a starting point in conducting pricing studies on the market (Glosten, 1989; Stoll, 1989). Market makers will continuously provide liquidity to the market and enable transactions to occur continuously by balancing the timing of unsynchronised investor orders (Madhavan, 2000)

Structural Model Based on Information

The implications of the inventory model used to examine market price behaviour are transaction costs (including inventory costs) that determine bid ask spreads. Bagehot (1971) states that market prices depend not only on transaction costs, but also on the role of information. This model of information sets out from the adverse selection theory to demonstrate how bid ask spread persists, albeit in a competitive market with no explicit transaction costs.

Liquidity Measure

Lesmond, Ogden and Trzcinka (1999) introduced an alternative method of indirect estimation of liquidity based on the absence of zero yields, which is known as Lesmond Ogden Trzcinka (LOT). The LOT is a comprehensive liquidity cost estimate by including spreads and other costs borne on informed transactions, such as commission fees, opportunity costs, and cost-impact costs. The premise is, if the true value of a bond is affected by many stochastic factors, the new information will be reflected by the measured price only if the value of information from the marginal trader exceeds the total cost of liquidity. This implies that a liquidity cost limit exists for each asset, which equals the minimum value of information for a transaction. The probability of zero yield observation is higher within the liquidity cost limit than outside the liquidity limits. The model estimation is done through the maximum likelihood method to combine the estimation of risk factors related to the information in market and limit of liquidity cost.

Market Systematic Liquidity

According to Chordia, Roll and Subrahmanyam (2000) a market phenomenon indicates a market liquidity risk of all traded assets. Among the sources of occurrence are volume of transactions, inventory costs, market rates, and funds of various institutions that have similarities in investment behavior. Transaction volume is the main determinant of the dealer supply level. The variation in transaction volume leads to a mutual movement in determining the optimal inventory levels that dealers must reach. The mutual movement at the optimum inventory level will lead to mutual movement of individual bid ask spreads, quote depth, and other liquidity measures. Equal investment behavior of institutional investors leads to an interconnected pattern of trade, ultimately affecting the inventory levels of all dealers in the market. If inventory fluctuations are interrelated to each existing asset, the liquidity level of each asset in the market will also be related

(Chordia et al., 2000). Thus, within the risk faced by the dealer due to having inventory, there is a market liquidity component.

METHODS AND DATA

Empirical Research Model

In order to test the hypothesis, an empirical model was developed that explains various factors that researchers consider to influence the bond yield rate as a variable for price formation in the OTC market of Indonesian bonds. Specifically, the test of each determinant factor is done through the model parameter test contained in the research model. For each bond i on day t, the general empirical model constructed in this study is:

$$\begin{aligned} r_{i,t} = \beta_0 &+ \beta_1 CountryRisk_{i,t-1} \\ &+ \beta_2 Liquidity_{i,t-1} \\ &+ \beta_3 InformationRisk_{i,t-1} \\ &+ \beta_4 LikuidityRisk_{i,t-1} \\ &+ \beta_5 PriceVariability_{i,t-1} \\ &+ \beta_6 Maturity_{i,t-1} \\ &+ \beta_7 BidAskSpread_{i,t-1} \\ &+ \beta_8 OutstandingBonds_{i,t-1} \\ &+ \beta_9 TransactionVolume_{i,t-1} \\ &+ e_{i,t} \end{aligned} \quad (1)$$

Where for each bond i and day t:

$r_{i,t}$ = the average daily bond yield reduced by the corresponding maturity government bond yield;

$CountryRisk_{i,t-1}$ = credit default swap of daily state bonds corresponding to rating and maturity of bonds;

$Liquidity_{i,t-1}$ = measure of liquidity reflecting transaction costs;

$InformationRisk_{i,t-1}$ = the size of the risk of daily information reflecting the arrival rate of the order informed;

$LiquidityRisk_{i,t-1}$ = measure of systematic liquidity risk of daily market of OTC bonds in Indonesia;

$PriceVariability_{i,t-1}$ = daily price variability sizes weighted by volume of transactions;

$Maturity_{i,t-1}$ = the remaining age of the bonds until maturity in the year;

$TransactionVolume_{i,t-1}$ = average volume per transaction in a day weighted by total par value of issued bonds; and

$OutstandingBonds_{i,t-1}$ = natural logarithm of total par value of bonds issue

Data and Research Data Sources

In order to perform calculations on various measures of liquidity, following data is used: intraday transaction data reported by the dealer through Centralized Trading Platform (CTP) containing information including bond type, time, price, and transaction volume; settlement data of each bond transaction owned by KSEI-CBEST containing related information including end buyer, end seller, bond type, time, price, and transaction volume; bond reference price data announced by PHEI (or called IBPA); bid-ask spread data obtained from KSEI-CBEST; and the credit swap premium data of government bonds as a proxy for the country's risk premium, derived from KSEI-CBEST.

Measuring the Liquidity of Corporate Bonds

Measures of transaction costs with variants of the LOT model (1999). The LOT model can be used as an alternative to measure the transaction costs of bonds. The main advantage of the LOT model is that it requires only time series data on daily bond yields, making it easier and more efficient to estimate transaction costs for all bonds and the period of time for which daily data on yields is available. Additionally, the LOT model can be used to link transaction cost estimation with various theories and empirical studies of market efficiency and market structure analysis, so that traders and other market participants can use this model to justify the realised transaction costs and competitive profit expectations. Furthermore, marginal time traders in making decision rules when information is disclosed in the market can be regarded as transaction costs, whereas the price impact upon the executed order belongs to the transaction costs and should be recognised in measuring the performance of the market transaction strategy (Lesmond et al., 1999).

However, continuous bid-ask spreads on all bond series are very difficult, especially in the emerging market OTC market like Indonesia. Moreover, in Indonesia's OTC bond market, bonds are often traded on a small volume (thinly traded bonds), and therefore, bid-ask spreads become less suitable (Chen et al., 2007). To that end, the present study will use a modification or variant of the LOT model. With this model, researchers can avoid the limitations of using the bid-ask spread, because the effect of transaction costs is reflected directly on the daily bond yields. In this model, transaction cost effects are modelled through zero yield events. The hypothesis used is that if the information signal value is not more than the transaction cost, the marginal investor will decrease the transaction or not transact, causing zero yield. This model uses the roots of the theory of adverse selection and tries to estimate the cost of effective transactions for marginal traders. The marginal investor will transact on the arrival of new information (or accumulated information) that is not reflected in the bond price only if the transaction generates profit beyond the transaction cost. Transaction costs become a limit that must be passed before bond yields reflect new information. Bonds with high transaction costs will have a frequency of rare price movements and more zero yields than bonds with lower transaction costs.

Measuring Information Risk

It is assumed at the start of every day, there is an α probability of the arrival of new information, a signal of the value of the traded asset. Good news means high asset value ($\bar{V}_i$), and bad news means that the asset value is low (V_i). Good and bad news happens with $1-\delta$ and δ probabilities. On every trading day, traders come independently to the Poisson process throughout the day. The market maker sets the price when the traders arrives, based on the information at the time of the transaction. Orders from informed traders come at the μ level (on the days of the information incident), and orders from uninformed buyers and sellers come at the ε_b and ε_s levels. Informed traders buy if they see good news and sell if they see bad news. The structural parameters of the model are estimated using transaction data. Easley et al. (2002) indicate that the likelihood function of the model for one day of transaction is:

$$L(\theta|B,S) = (1-\alpha)e^{-\varepsilon_b}\frac{\varepsilon_b^B}{B!}e^{-\varepsilon_s}\frac{\varepsilon_s^S}{S!} + \alpha(1-\delta)e^{-(\mu+\varepsilon_b)}\frac{(\mu+\varepsilon_b)^B}{B!}e^{-\varepsilon_s}\frac{\varepsilon_s^S}{S!} + \alpha\delta e^{-\varepsilon_b}\frac{\varepsilon_b^B}{B!}e^{-(\mu+\varepsilon_s)}\frac{(\mu+\varepsilon_s)^S}{S!} \quad (2)$$

Where B and S are the total number of buy and sell orders for that day and $\theta = (\alpha, \mu, \varepsilon_b, \varepsilon_s, \delta)$ are vector model parameters. The likelihood function has an interpretation. On a day without any news, happening with a $1-\alpha$, probability, pure buy and sell orders come from uninformed traders who come with intensity ε_b for buyers and ε_s for sellers. On a good news day, happening with the probability of $\alpha(1-\delta)$, an informed trader who comes with the intensity of μ will buy the asset. Thus, buy and sell orders will come with intensity $\mu+\varepsilon_b$ (buyer informed and uninformed) and ε_s (uninformed seller). On a bad news day, happening with the probability of $\alpha\delta$, an informed trader who comes with the intensity of μ will sell the asset. Thus, buy and sell orders will come with intensity ε_b (uninformed buyers) and $\mu+\varepsilon_s$ (informed and uninformed sellers).

By incorporating an independent structure throughout the transaction days, the likelihood function for observation for I day is obtained:

$$L(\theta|M) = \prod_{i=1}^{I} L(\theta|B_i, S_i) \quad (3)$$

Where (B_i, S_i) is the transaction data for day $i = 1, \ldots, I$.. Estimation of model parameters is done by maximising the likelihood function above. From the above model, the arrival of unobserved private information can be presumed through transactional data observed, among them the portion of an informed transaction (PIN) that represents the risk of information and is defined as:

$$PIN = \frac{\alpha\mu}{\alpha\mu + \varepsilon_s + \varepsilon_b} \quad (4)$$

Where $\alpha\mu + \varepsilon_s + \varepsilon_b$ is the arrival rate of all transactions and $\alpha\mu$ is the transaction arrival rate based on the information.

Measuring Systemic Market Liquidity Risk

To measure the risk of systematic liquidity of the market, researchers used the framework proposed by Alquist (2010), Chordia, Roll and Subrahmanyam (2001), Li et al. (2009), and Pastor and Stambaugh (2003). Due to the relatively short observation period of bond transactions, September 2006 to June 2011, and since not all bond series are within the observation period, data availability for time series modelling is limited. Therefore, to obtain a measure of systematic market liquidity risk, liquidity measures are converted first into daily bases. In this study, market liquidity on the day counts as an aggregation of the liquidity of individual bonds transacted on that day:

$$S_t = \frac{1}{N_t}\sum_{i=1}^{N_t} Liquidity_{i,t} \tag{5}$$

Systematic liquidity risk is measured as a bond yield sensitivity to innovation / unexpected changes in market liquidity. To that end, the researchers will estimate the time series selected by Scwarz information criterion (SIC). The ARMA model (K, M) can be written as:

$$S_t = \rho_0 + \sum_{k=1}^{K} \rho_k S_{t-k} + \sum_{m}^{M} \rho_{K+m}\eta_{t-m} + \eta_t \tag{6}$$

If the S_t series is non-stationary, it needs to be stationary by taking the differencing form and a time series model according to the SIC criteria as follows:

$$\Delta S_t = a_0 + \sum_{p=1}^{P} a_p \Delta S_{t-p} + \sum_{q=1}^{Q} a_{P+q} e_{t-q} + e_t \tag{7}$$

It is estimated throughout the sample period to build a series of liquidity shocks. Unexpected changes in market liquidity on a day are defined as:

$$LiquidityRisk_t = -\frac{\hat{\eta}_t}{\hat{\sigma}_\eta}$$

or

$$LiquidityRisk_t = -\frac{\hat{e}_t}{\hat{\sigma}_e} \quad (3.8)$$

(8)

RESULTS AND ANALYSIS

Testing of the Yield Spread Model of Corporate Bonds

The researchers estimate the regression model in Equation 3.1 and using the panel regression analysis, model estimation results are shown in Table 1.

Table 1
Determinants of Indonesian corporate bonds yield spread

Panel A: Test the best panel method

Statistical Test		**Regression 4**
LM Test		123.864***
Hausman Test		10.087
Panel B: Estimate Model of Determinant of Corporate Bonds Yield Spread		
	Random Effect Method	**PLS Method**
Variable	**Regression 4a**	**Regression 4b**
Constant	0.176**	0.164***
	(2.497)	(22.415)
$CountryRisk_{i,t-1}$	-0.005***	-0.005***
	(-70.428)	(-68.553)
$Liquidity_{i,t-1}$	0.340***	0.296***
	(55.289)	(63.485)
$InformationRisk_{i,t-1}$	-0.003***	-0.001
	(-4.774)	(-1.596)
$LiquidityRisk_{i,t-1}$	-2.17E-04	2.13E-04
	(0.000)	(-1.395)
$PriceVariability_{i,t-1}$	0.002***	0.002***
	(9.603)	(9.023)
$Maturity_{i,t-1}$	0.001***	4.44E-04***
	(7.374)	(6.878)
$BidAskSpread_{i,t-1}$	0.011	-0.012
	(0.993)	(-1.016)
$TransactionVolume_{i,t-1}$	-0.026**	-0.040***
	(-2.087)	(-3.029)
$OutstandingBonds_{i,t-1}$	-0.005*	-0.004***
	(-1.814)	(-15.553)
Adj. R-squared	0.296	0.304
F-Statistic	1,010.552***	1,049.858***

Source: Regression 4 (a, b) is estimated from Equation 3.1. In regression 4, liquidity is included in the calculated market of the data aggregation (differencing) LOT size. The values in parentheses show 't-statistic'. The *** sign indicates significance at the 1% level. The ** sign shows significance at the 5% level. * Signs indicate significance at 10% level. The observation period was from October 17, 2006, to June 29, 2011.

DISCUSSION

Testing of Information Risk

The hypothesis of this study is PIN values negatively affect yield spread. Table 1 shows that PIN has a significant negative effect on bond yield spread. This suggests that the hypothesis built related to the negative effect of PIN on the yield spread of corporate bonds can be statistically accepted. In the context of information risk model developed by Easley et al. (1996a, 1996b, 2002), PIN reflects probability of the arrival of an order from an informed trader to a market maker. As a result, a market maker may experience the risk of incorrect decision making in addressing the order flow placed in the informed trader and may incur losses. To cover losses from transacting with an informed trader, the market maker will exploit transactions with uninformed traders, where they typically trade because they are driven by liquidity and not the result of information. The market maker will seek to profit from the difference of the transaction price (market excess return) with uninformed traders. Thus, the relationship between "market excess return" and the PIN as a measure of information risk is positive. This supports the hypothesis and is empirically proven by Li et al. (2009) on government bond markets in the US and by Easley et al. (2002) in the US stock market. The profit earned from the transaction ("market excess return") can only be obtained by the market maker when the difference between the selling price of a bond and the purchase price is positive, meaning that there is a price increase between buying and selling. When the selling price of the bond rises, the yield to maturity of the bond held by the market maker will fall, because prices and yields to maturity have a negative relationship. Therefore, it can be said that when the risk of information reflected on the PIN increases, the market maker will make a profit by raising the bond sale price, and then the yield to maturity of the bond will fall. That is, the relationship between yield to maturity and risk information is negative. In this study, researchers used the proxy yield spread instead of market excess return as shown by Easley et al. (2002) or Li et al. (2009). Empirically, researchers also found the results to be consistent with the negative relationship between yield to maturity with information risk; in other words, when the PIN increases, then the yield spread will decrease. However, when yields to maturities on government bonds are independent of corporate bonds, the rising yield to maturity of corporate bonds also means an increase in the yield spread, thus indicating the risk of information has a negative relationship with the yield spread.

Testing of Bond Liquidity

Table 1 shows that liquidity had a significantly positive effect on yield spread. This suggests the positive effect of illiquidity on the yield spread of corporate bonds. This study used LOT to measure the amount of marginal cost that investors need to be willing to transact, in either buying or selling bonds. By definition, liquidity is the size of a bond quickly transacted at a large quantity, at a low cost, and without significantly altering the price (Amihud, 2002; Pastor & Stambaugh, 2003). Thus, the more liquid, the lower the transaction costs and the lower the yield obtained by investors, because the price is fixed or down but not significant. Based on the model of Lesmond et al. (1999), the greater the marginal cost investors demand for transactions, the less liquid a bond is, and the yield to maturity demanded by investors is also increasing. The results of the empirical model estimation in Table 1 show the positive and significant direction of the effect of bond illiquidity on yield spread. The rising cost of bond transactions in the market will lower the level of bond liquidity and encourage investors to increase their liquidity premiums as compensation for the uncertainty of bonds. Thus, based on this explanation, the hypothesis that LOT has positive effect on yield spread is supported and consistent with the concept of transaction costs discussed by Lesmond et al. (1999) and Chen et al. (2007). These findings support the results of previous studies, such as Chen et al. (2007), Jankowitsch, Mösenbacher and Pichler (2003), and Longstaff, Mithal and Neis (2005) who found a negative effect of liquidity on bond yields. They found the more liquid an asset is, the lower illiquidity risk demanded and the lower the required yield.

Testing of Systematic Market Liquidity Risk

Table 1 shows that Liquidity Risk has a negative effect on bond yield spreads and is significant with proxies that measure using bid-ask spread. These findings suggest negative effects of systemic liquidity risk on the market yield spread. Price and yield to maturity have a negative relationship (Ross, Westerfield, & Jaffe, 2003), therefore, these findings support those of Longstaff (2004), Pastor and Stambaugh (2003), Li et al. (2009), and Alquist (2010), who found that systematic market liquidity risk increased market excess return from government bonds. Investor demand on less liquid bonds is more sensitive to market systematic liquidity than liquid bonds and have an impact on the high price sensitivity on less liquid bonds (Chung, 2008; Longstaff, 2004). In times of crisis, investors will balance portfolios to more liquid bonds, although they have to sell less liquid bonds at a higher cost (Chung, 2008). Systematic market liquidity risk can be measured by standardised innovations of market liquidity, such as those proposed by Alquist (2010), and Pastour and Stambaugh (2003). The greater the innovation, the more sensitive a bond will be to changes in market liquidity; hence, the higher systematic market liquidity risk an investor faces when holding this bond (Li et al., 2009). Therefore, investors will ask for higher compensation on this bond. This compensation will be reflected in the high market excess return of the price difference (Alquist, 2010; Li et al., 2009) and the low yield spreads demanded. This is because, theoretically, prices have a negative relationship with yields to maturity (Ross et al., 2003). Thus, the higher the systematic liquidity risk of a bond market, the lower yield spread the investor will demand. In the bond market, as market conditions worsen, government bonds are relatively more active than corporate bonds. Moreover, the risk of default when holding government bonds is relatively lower than corporate bonds, so a phenomenon known as flight to quality (Longstaff, 2004). As a result, the corporate bond market liquidity will disappear and shift to the government bond market; this phenomenon is known as flight to liquidity (Alquist, 2010; Chung, 2008; Longstaff, 2004). The next impact is the price discount on the government bond market that seems much higher than the corporate bonds. When the market in general worsens, the price discounts on corporate bonds will be very high (due to quality and liquidity), so investors will choose to sell government bonds to meet their liquidity requirements rather than selling corporate bonds. As a result, government bond prices will move down (discounted) and cause yields to maturity to rise. At the same time, the price of corporate bonds is relatively silent because of the hold action of investors, resulting in a relatively fixed yield to maturity. Thus, the yield spread of corporate bonds will be inverted, and this negative yield spread gets bigger along with falling government bond prices due to the worsening market conditions.

CONCLUSION

There is very limited analysis of information risk in the market microstructure literature in Indonesia. Based on the results of the study on the impact of risk information and liquidity on the yield spread of corporate bonds in Indonesia using intraday data, this research can draw several conclusions as follows. First, liquidity has a negative effect on the corporate bonds yield spread. The lower the liquidity, the greater the cost of the requested transaction, thus causing the bond to become less liquid and driving up the yield spread demanded by investors. Liquidity measured by Lesmond Ogden Trzcinka model reflects the marginal cost demanded by investors in order to transact. Therefore, the larger LOT value actually reflects the low liquidity or increased illiquidity so that the LOT value will have a positive effect on the yield spread of corporate bonds. The liquidity of Indonesian corporate bonds is quite low when compared with the bond market in the United States. By using the LOT proxy, the average transaction cost in Indonesia reached 3.10% (or 310 bps), while in the US, it reached only about 26-54 bps for investment category bonds and 22.5-95.5 bps for speculative bonds (Chen et al., 2007). This shows that Indonesia's corporate bond market is still less liquid than that in the United States. Second, information risk negatively affects the corporate bonds yield spread. As the risks of information increase due to the increased arrival of informed transactions, the market maker will make a profit by raising the bond sale price. When the sale price of the bond increases, the yield spread of the bond held by the market maker will decrease. Thus, when the risk of information as estimated by Probability of Informed Trading (PIN) increases, it will cause the yield spread of corporate bonds to decline. The average value of Indonesian corporate bond issuance is 7.98%, and this value is lower than government bonds in the United States according to the findings of Li et al. (2009), which is 26%. The low PIN value of the Indonesian market indicates that the informed trader's exploitation rate is lower than that of the US bond market. Third, systematic liquidity risk of the market negatively affects the yield spread of corporate bonds. Investor demand on less liquid bonds is more sensitive to systematic liquidity of the market than liquid bonds and has an impact on the high price sensitivity on less liquid bonds (Chung, 2008; Longstaff, 2004). Thus, the higher the systematic liquidity risk of a bond market, the lower yield spread the investor will demand.

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