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INDONESIAN CAPITAL MARKET REVIEW

Trading Friction and Spread Decomposition in Indonesian Stock Exchange

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We examine the intraday trading and price change for frequently traded stocks in Indonesian Stock Exchange. Using bid and ask price, trade price, number of trade, trade volume, we estimate trading friction and spread decomposition. The objective of the estimation is to infer what is the biggest component of trading friction. The result of 50 most frequently traded stocks in the Indonesian Stock Exchange using trading friction estimator conclude that the average trading friction of high market capitalization and the most relatively liquid stocks, scattered in various fractions price is equal to 1% per year, and the highest trading frictions derived from the information and it is consistent with spread decomposition estimator.

Keywords: Trading friction; Spread decomposition; High market capitalization; Frequently traded stock; Liquid stock.

JEL classification: G10, G12, G14, G23

Introduction

Some empirical studies, at least since Demsetz who examined the determination of prices in security market argued that the balance can be obtained by agreeing on a certain price as cost of immediacy (Demsetz, 1968). This cost could be either explicit or implicit. Explicit cost arising for example from charge levied by a particular market and its existence can be felt directly by investors such as brokerage fee and government tax, while implicit reflecting cost connected with the immediate executing trading, arose because unlike in the Walrasian auction, trading had a time dimension. If the number of trader wishing to sell immediately did not equal the number who wished to buy

immediately, the imbalance of trade would make it possible to find a market clearing price at a given time t . Demsetz argue that this lack of equilibrium could be overcome by paying a price of immediacy (Demsetz, 1968). This implicit costs referred to the price of immediacy. Implicit transaction cost is an invisible cost and its existence cannot be felt, such as bid-ask spread and missed trade opportunity cost. The view of the transaction cost continues to grow with the discovery of the composition of transaction cost which includes order processing cost, inventory holding cost and asymmetric information cost (adverse information cost). These transaction costs are the obstacles for investors to reach the balance in market, Stoll called it trading friction (Stoll, 2000).

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Empirical study of trading friction for the first time is carried out by Stoll (2000). Trading friction is defined as a constraint for traders when trading their assets, which caused unbalanced. Trading friction on Stoll's research stated as a cost on each transaction or half spread, while similar research that had been done previously is the cost for two times transactions (round trip) or the spread. Stoll classified friction into real friction and informational friction. Real friction as consequence to used resource such as order processing cost and inventory holding cost, and informational friction arising from adverse information.

Trading friction in financial market is an important determinant of the liquidity of securities and the price efficiency. The importance of trading frictions and their impact on asset pricing is illustrated by the large number of studies that examine the interrelationship between transaction costs, expected returns, liquidity and informational efficiency.

Cai, Hillier, Hudson, and Keasey (2008) examine trading friction in hybrid system (both electronic order book and competitive dealer market). Using bid-ask spreads, they present evidence which suggests that while real frictions associated with the costs of supplying immediacy are less in order-driven systems, informational frictions resulting from increased adverse selection risk are considerably higher in these markets. Firm value, transaction size and order location are all major determinants of the trading costs borne by investors.

Consistent with earlier studies, see for example Huang and Stoll (1997), Stoll (2000), Cai et al. (2008) initial results suggest that the total cost of trading is lower on order driven systems. This is characterized by a significantly higher number of small transactions that go through the order book in contrast to a low number of large transactions with dealers.

Trading friction is a determinant of stock liquidity. Informational friction or friction, which is caused by asymmetric information on order driven market, is higher than real friction (Stoll, 2000). The high of informational friction on order driven market is because limit order book market is dominated by small trader, con-

sidering that limit order is a market which has a strong foundation so it is profitable for a small trading (Glosten, 1994).

Allen (2014) examine how such information frictions affect trade. Using data on regional agricultural trade in the Philippines, he documented a number of observed patterns in trade flows and prices that suggests the presence of information frictions and conclude that information frictions are quantitatively important.

In a classic article of the theory of information based security price establishment, Kyle (1985), identifies liquidity based on three indicators (dimensions), such as tightness, depth and resiliency. Tightness of bid-ask spread is about how much cost needed to turn a trader's position in a market in a short time, which means how much transaction cost to do a security sale and then repurchase it back or vice versa. Depth is a placement of minimum order quantity, which can cause a price changing. Resiliency is how long the price goes back to its original position after shock or bid ask bounce. Liquidity can be reviewed from immediacy aspect, how fast trade transaction in specific quantity and specific price (Harris, 2002).

Stock market is said to be liquid when bid and ask for investor who will sell and purchase stocks in a short period of time, are always available, with a lower bid-ask spread, and the stocks can be traded quickly in a small amount with market price or vice versa (Black, 1971). Bid is a cost where all market traders are ready to purchase and ask is a price when the traders are ready to sell. The difference between ask and bid shows the bid-ask spread. Some components of bid-ask spread that are faced by dealer are order processing cost, inventory holding cost and adverse information (Campbell, Lo, & MacKinlay, 1997).

The different between bid and ask spread has long been of interest to traders, regulators and researcher. While acknowledging that the bid-ask spread must cover the order processing cost incurred by the providers of market liquidity. Several statistical models empirically measure the components of the bid-ask spread. In one class pioneer by Roll (1984), inferences about the bid-ask spread are made from the serial

covariance properties of observed transaction process. Covariance serial price reversal model that is formulated by Roll (1984) has an important role in the first model of covariance spread that can define probability of price reversal (π) or continuation ($1-\pi$). Reversal will occur if after bid trading is ask trading and vice versa.

Statistical model of spread components have been applied in a number of ways for example to determine the source of spread components [(Huang and Stoll, 1997), (Stoll, 1989)]. Previous study of spread decomposition find that asymmetric information on order driven market is higher than real friction (Stoll, 2000). The high of informational friction on order driven market is because limit order book market is dominated by small trader, considering that limit order is a market which has a strong foundation so it is profitable for a small trading (Glosten, 1994). The high of effect of information on order driven market shows that there is a loss of uninformed trader in information ownership of informed trader.

Huang and Stoll (1996) compares the execution cost of stock trading on NASDAQ and NYSE using several friction measurement models such as quoted spreads, effective spreads, realized spreads and roll spreads, find that spread on NASDAQ which is dealer driven market is bigger than the NYSE which is order driven market.

Research result of Cai et al. (2008), consistent with previous research conducted by Huang and Stoll (1996) and Stoll (2000), find that total friction in order driven market is lower than dealer driven market, while asymmetric information is more high on order driven market. The low cost of friction in the order driven market is due to the high number of small-scale transactions through increased supply of liquidity in order book through the placement of limit orders. As a stock exchange that implements the order driven trading system, trading friction in Indonesian Stock Exchange may be caused by a higher informational effect than by non-informational effect.

Voetmann (2016) investigates the cost components of bid-ask spreads around earnings announcements on the small Danish stock market

in the 1990s. The results indicate that negative earnings surprises convey pricing information, suggesting the existence of significant information asymmetry between market makers and informed traders. Negative earnings surprises resulted in an increase in adverse-selection cost and trading volume while inventory-holding and order-processing costs decreased, leading to a combined decrease in the realized spread. The change in the realized spread is significant, while the change in the quoted bid-ask spread is negligible. Overall, the results suggest that informed traders' ability to assess firms' performance in the Danish stock market affects the bid-ask spread around announcements of earnings. The observed changes in cost components on the small Danish stock market are similar to those observed in larger and more active capital markets.

Luo (2017) compare the effective bid ask spread and examines the decomposition of spread in London Stock Exchange (LSE) and New York Stock Exchange (NYSE). Result indicate that order persistence cost is higher in NYSE than in LSE, while order processing cost is lower in NYSE. Higher proportion of bid ask spread is directly related to information inefficiency in LSE.

Gregoriou and Rhodes (2017) examine the empirical relationship between trades undertaken by informed agents (managers) and the proxies for informed trades computed by bid-ask spread decomposition models in London Stock Exchange. He find overwhelming evidence of non-stationary behaviour between the actual and predicted informed trade prices. The findings suggest that there is a clear need for an alternative to extant spread decomposition models perhaps incorporating findings from behavioural finance. Originality/value given the importance of stock market liquidity and the extensive use of spread decomposition models in predicting informed trades.

This study focuses on the intraday high frequency data activity of the most liquid stock in Indonesian Stock Exchange for 3 months trading in 2006, 2 months trading in 2007 and 3 months trading in 2008. Using three periods in this research to know the difference of trading

friction at the time of crisis in 2008 with trading friction at the time before crisis in 2006 and 2007. We find that, the percentage of trading friction at the time of crisis in 2008 is 0.75%, is higher than trading friction at the time before the crisis, 0.69% in 2007 and 0.68% in 2006.

For high frequency data, the trade off is limit of quantity of stock. As comparison, the similar research used high frequency data is Stoll (2000) which used same duration 3 months, (Bowsher, 2007) used 2 sample of stocks for 2 months, and Darminto (2010) used 4 sample company Stocks for 1 month trading on January 2008 (20 day exchange). This research use secondary data which are order data, intraday trade price transaction, Indonesian Composite Index.

Based on literature study, research on trading friction and spread decomposition is still limited. Empirical studies on asset pricing that develop recently have loosen assumptions on frictionless market (riskless), imperfectly liquid market and symmetric information. There is no trading transaction can be done without cost, the market was not always in the condition of equilibrium because to achieve the balance required costs and not all of the investors can access the information that develop as a consequence of its presence in the market not all the time or the existence of asymmetric information.

Further research on trading friction and spread decomposition was not much be done. Considering that evidence, our further investigation to measure trading friction and spread decomposition can be a contribution of this research. We find that the average trading friction is 1% per year and the friction of 1% per year is a friction generated at relatively liquid company and the highest trading frictions derived from the information and it is consistent with spread decomposition estimator.

The rest of the paper proceeds as follows: Section one describes introduction. Section two explores measurement of trading friction and spread decomposition. The research methods is presented in section three. Section four report results and discussions and the paper is concluded in section five.

Literature Review

Friction in financial markets measures the difficulty with which an asset is traded (Stoll, 2000). Trading friction is defined as a constraint for traders when trading their assets, which caused unbalanced. Moreover, trading friction is also defined as implicit transaction cost. A certain price is needed to overcome it (Demsetz, 1968). Demsetz named it price for immediacy or cost of immediacy and Stoll (2000) named price for immediacy as a friction.

Measurement of Trading Friction

In this study, we use quoted half spread, effective half spread, traded half spread and covariance price reversal or covariance of transaction price change to measure trading friction. These are based on the models proposed by Stoll (2000).

Quoted and Effective Half Spread

The quoted and effective spread is used to measure total friction that reflect both real and informational friction. A quoted half spread is associated with each transaction while quoted spread measures spread in round trip trade. Quoted half spread defined as

$$S=(A-B)/2 \quad (1)$$

where A is the ask price and B is the bid price. The daily average value of the quoted half spread is calculated by weighting each spread by number of trades at that spread. An alternative measure of friction is the effective half spread. The effective half spread defined as

$$ES=|P-M| \quad (2)$$

where P is the trade price and M is the quote midpoint. The daily average value of the effective half spread is calculated by weighting each spread by number of trades at that spread. The research result from Cai et al. (2008), Huang and Stoll (1996) and Stoll (2000) show the ef-

fective half spread is lower than quoted half spread. Effective half spread is an actual total friction measured because using a stock price variable than quoted half spread with bid and ask.

Traded Half Spread

Traded half spread is one of the model used to measure real friction. The traded half spread is half the difference between the average price of trades at the ask side less the average price of trades at the bid side. A trade is at the ask side if its price is closer to the ask than to the bid. It is at the bid side if its price is closer to the bid than to the ask. There are two version of the traded half spread, differing in the weighting of trades are calculated. The first weights each trade equally. The second weights by trade volume. The first traded half spread defined as (Stoll,2000)

$$TS1 = \frac{\bar{P}_1^A - \bar{P}_1^B}{2} \quad (3)$$

$$\text{where } \bar{P}_1^A = \frac{1}{m} \sum_1^m P_i^A \text{ and } \bar{P}_1^B = \frac{1}{n} \sum_1^n P_i^B$$

\underline{m} is number of trades on the side of ask, \bar{P}_i^A is price in trade in i in the side of ask, \underline{n} is trade quantity in the side of bid, and \bar{P}_i^B is price in trade in i in the side of bid.

The second traded half spread defined as

$$TS2 = \frac{\bar{P}_2^A - \bar{P}_2^B}{2} \quad (4)$$

where

$$\bar{P}_2^A = \frac{1}{\sum w_i^A} \sum_1^m w_i^A P_i^A \text{ and } \bar{P}_2^B = \frac{1}{\sum w_i^B} \sum_1^n w_i^B P_i^B$$

w_i^A is share volume of the first buy in i and w_i^B is share volume of the first sell in i .

Stoll (2000) did not formulate a specific model for informational friction. In this case, informational friction is considered to be difference between total friction and real friction.

Covariance of Transaction Price Change

Covariance of transaction price change or covariance price reversal model which formu-

lated by Roll (1984) has an important role in the first model of covariance spread that can define probability of price reversal (π) or continuation ($1-\pi$). Reversal will occur if after bid trading is ask trading and vice versa. In efficient market where is assumed there is no adverse information and inventory holding cost or $\alpha=\beta=0$, covariance price reversal model is formulated as

$$\text{cov}(\Delta P_t, \Delta P_{t+1}) = -\frac{1}{4} S^2 \quad (5)$$

Based on the Roll assumed, spread is not from the information effect or inventory. Based on equation 5, then spread can be noticed as

$$S = 2\sqrt{-\text{cov}(\Delta P_t, \Delta P_{t+1})} \quad (6)$$

Equation 6 next called Roll price (Roll P) and half spread formulated as

$$S = \sqrt{-\text{cov}(\Delta P_t, \Delta P_{t+1})} \quad (7)$$

Spread Decomposition

Covariance return is an estimation of the realized spread as expected revenue in the efficient market. Covariance for transaction cost change is covP , covariance for quote at bid is covB and covariance for quote at ask is covA . The covariance of transaction price change is (Stoll, 1989)

$$\begin{aligned} \text{Cov P} &= \text{cov}(\Delta P_t, \Delta P_{t+1}) \\ &= S^2[\delta^2(1-2\pi) - \pi^2(1-2\delta)] \end{aligned} \quad (8)$$

$$\text{covB} = \text{cov}(\Delta B_t, \Delta B_{t+1}) = \delta^2 S^2 (1-2\pi) \quad (9)$$

$$\text{covA} = \text{cov}(\Delta A_t, \Delta A_{t+1}) = \delta^2 S^2 (1-2\pi) \quad (10)$$

The equation 8 to 10 can apply in regression equation such as in equation 11 and 12

$$\text{covP} = a_0 + a_1 S^2 + u \quad (11)$$

$$\text{covQ} = b_0 + b_1 S^2 + v \quad (12)$$

where u and v are random error. Intercept and slope in equation 11 and 12 can be formulated

Table 1. Trading Stock Data

	Year		
	2006	2007	2008
Observation Period	3 months	2 months	3 months
Average Trading Day	51	41	50
Total Transaction	541.875	804.785	1.719.175
Average daily Transaction	277	453	693

$$a_1 = \delta^2(1-2\pi) - \pi^2(1-2\delta) \quad (13)$$

$$b_1 = \delta^2(1-2\pi) \quad (14)$$

Next spread decomposition can be used to measure adverse selection cost is

$$1-2(\pi-\delta) \quad (15)$$

to measure inventory holding cost is

$$2(\pi-0.5) \quad (16)$$

and to measure order processing cost is

$$1-2\delta \quad (17)$$

According to Huang and Stoll (1997), it is assumed $\pi = \frac{1}{2}$, and $\beta = 0$ or nothing inventory holding cost, so equation 8 can be formulated :

$$\text{cov}(\Delta P_t, P_{t+1}) = -(1-\alpha) \frac{S^2}{4} \quad (18)$$

Research Methods

Friction measurement and spread decomposition will be tested in some samples from the go public companies in Indonesian Stock Exchange. This research use secondary data which are order data, intraday trade price transaction, Indonesian composite index, trade volume, number of trade and market capitalization.

Our samples are consist of 38 liquid stocks in 2006 or 10,9 % from the population, 43 liquid stocks in 2007 or 12 % from the population and 50 liquid stocks in 2008 or 12,3 % from the population. Observation period is divided in three points, which are in 2006, 2007 and 2008. It is to analyze the influences of trading friction especially when crisis happened in dropped time of Lehman Brothers in 2008, and the period before the crisis is in 2006 and 2007.

Table 1 present our research data from three years, consist of three months in 2006 and 2008 (August, September and October) and two months in 2007 (July and August). The average number of trading days for 3 months of 38 stocks that researched in 2006 is 51 days with the trading transactions of 541.875 transactions. In 2007, the average numbers of trading days for 2 month of 43 stocks that researched are 41 days with the number of trading transactions of 804.785 transactions. In 2008, the average number of transactions days for 3 months of 50 stocks that researched in 50 days with the number of trading transactions of 1.719.175 transactions.

The samples are chosen purposively. All of the population in observation period is sorted based on the market capitalization and tick size, from the biggest to smallest. Next, we determine 50 stocks that have highest value of market capitalization, which represent four categories of tick size in 2006 and five categories of the tick size in 2007 and 2008. Order data and transaction is collected only from the regular market, because regular market is suitable with mechanism of open market auction and proceed continuously with price and quantity, which are standardized by exchanges.

Furthermore, we construct several hypothesis to identify the source of trading friction (real friction or informational friction) and to prove that the informational friction is bigger than real friction and for spread decomposition. Moreover, we want to measure and to prove that inventory holding cost is the littlest spread decomposition.

Before calculating the trading friction, first, we determine the bid and ask price per transaction in 5 second before trading. After that, we calculate trading friction using quoted half spread (S), effective half spread (ES), first traded half spread (TS1), second traded half

Table 2. Measures of Friction and Proportional Friction

Year	Friction									
	S	ES	TS1	TS2	Roll P	%S	%ES	%TS1	%TS2	%Roll P
2008	22.364	23.677	9.632	8.716	3.166	0.010	0.012	0.006	0.005	0.002
2007	20.516	21.404	8.698	7.984	3.180	0.012	0.012	0.003	0.003	0.002
2006	20.283	20.048	9.264	8.951	3.505	0.011	0.011	0.005	0.005	0.002
Difference (2007-2008)	18.478	22.735	0.935	0.732	(0.014)	(0.001)	(0.000)	0.002	0.002	0.000
Difference (2006-2008)	20.808	36.292	0.368	(0.235)	(0.339)	(0.000)	0.000	0.000	0.000	0.000

spread (TS2) and Roll price (Roll P). Trading friction is calculated to all sample of each stock research (individual) during observation period. Further, correlation test between some alternative trading friction measurement is done to know whether that measurement of trading friction are correlated with each other. Then, based on spread decomposition tests, we find which of the three component of spread, is the most dominant in the Indonesian Stock Exchange. Moreover, we calculate proportional half spread. Although the Indonesian Stock Exchange is a pure order driven market, which in its trading system does not play the role of market maker, in fact, every trader will consider the consequences of holding inventory, in case of changes in asset prices owned or in the case of inflation. Trader will take into account the present value of the real return earned.

Results and Discussions

Some alternative of friction measurements

Table 2 present the result of some alternative of friction measurement. Effective half spread (ES) and quoted half spread (S) are total frictions which consist of order processing cost, inventory holding cost and adverse information cost. Based on the calculation of frictions during the observation period, it is known that the average amount of frictions in Indonesian Stock Exchange on large capitalized stocks is 1%. The average proportional quoted half spread (%S) at Indonesian Stock Exchange in 2006 is 1.1%, and the average proportional effective half spread (%ES) is 1.1%. In 2007 the average of proportional quoted half spread (%S) is 1.2%, and the average of proportional effective half spread (%ES) is 1.2%. While in 2008, the average of proportional quoted half

spread (%S) at Indonesian Stock Exchange is 1.%, and the average of proportional effective half spread (%ES) is 1.2%. The total frictions in 2008 is higher than in previous years, corresponding to the results of the Pedersen research (2005), which stated in the time of crisis the frictions were greater.

By defining trade friction as the constraints that are faced by investors in trading transactions which is implicit cost consists of real friction and informational friction, it can be seen that the highest trade friction are sourced from adverse information cost. Table 3 shows the test result for all data describes average difference between informational friction and real friction.

The difference of average result between informational friction measured based on the differences % quoted half spread with % first traded half spread (%S-%TS2) describes informational frictions significantly higher than real fiction (%TS2) in all data. The difference of average result between informational friction measured based on the differences % effective half spread with % first traded half spread (%ES-%TS1) describes informational friction is significantly higher than real fiction (%TS1) in all data process especially in 2006 and 2007. All of average proportional informational friction measured based on differences % effective half spread with % second traded half spread (%ES-%TS2) higher than real friction (%TS2). It is similar with the difference of average result in every year observation, it shows significant result with average 23% significant to α 5% in 2006, the average 50% significant to α 1% in 2007 and the average 8% significant to α 10% in 2008.

The high of informational friction at the order driven market like in Indonesian Stock Exchange is similar with the previous research by Glosten (1994) and Cai et al. (2008). The high effect of information of order driven market

Table 3. Average Difference between Informational Friction and Real Friction

	Average Difference between Informational Friction and Real friction			All Data
	2006	2007	2008	
Panel A: %S-%TS1 and %TS1				
Average of %S-%TS1	0.61%	0.8%	0.47%	0.62%
Average of %TS1	0.54%	0.37%	0.58%	0.5%
Average Different	0.07%	0.43%	-0.11%	0.12%
st dev.	0.57%	1.81%	0.6%	1.16%
t-stat	0.8835	16.787	-1.3437	0.725
Sig	0.1913*	0.0503**	0.0926**	0.2349
Panel B: %S-%TS2 and %TS2				
Average of %S-%TS2	0.63%	0.82%	0.5%	0.64%
Average of %TS2	0.51%	0.36%	0.55%	0.48%
Average Different	0.11%	0.46%	-0,05%	0.17%
st dev.	0.63%	1.66%	0.56%	1.08%
t-stat	1.282	19.671	-0.5964	10.924
Sig	0.1039*	0.0279***	0.2768	0.1383*
Panel C: %ES-%TS1 and %TS1				
Average of %ES-%TS1	0.61%	0.84%	0.59%	0.68%
Average of %TS1	0.54%	0.37%	0.58%	0.5%
Average Different	0.08%	0.47%	0.01%	0.18%
st dev.	0.57%	1.83%	0.48%	1.14%
t-stat	0.9541	18.086	0.1516	11.141
Sig	0.1731*	0.0388***	0.4401	0.1336*
Panel D: %ES-%TS2 and %TS2				
Average of %ES-%TS2	0.63%	0.86%	0.63%	0.7%
Average of %TS2	0.51%	0.36%	0.55%	0.48%
Average Different	0.12%	0.5%	0.08%	0.23%
st dev.	0.62%	1.69%	0.45%	1.07%
t-stat	13.582	21.012	12.127	15.118
Sig	0.0913**	0.0208***	0.1155*	0.0665**

* significant at 10% level, **significant at 5% level, ***significant at 1% level

shows that there is secretion or loss market participant for the information from the informed trader. In general order driven market tends to have higher informational friction and real friction than dealer driven because the information of small trader is higher.

Spread Decomposition

To measure spread decomposition, we use Stoll model (1989) that assumed there is three form components of spread, consist of order processing cost, inventory holding cost and adverse information cost and Huang and Stoll model (1997) that assumed there is two form components bid-ask spread, consist of order processing cost and adverse information cost

Table 4 present the result of spread decomposition using Stoll model (1989). Based on the result of spread decomposition test using this model, the components of transaction cost in Indonesian Stock Exchange include adverse in-

formation cost 70,3%, inventory holding cost 49,34% and order processing cost -19,65%. As well as hypothesis based on the earlier research, that the highest component transaction cost at the order driven market is adverse information cost. In general during observation period, order processing cost is the lower cost, moreover has percentage negative, which indicated decrease order cost during observation period.

The comparison analysis between years show that adverse selection cost in 2008 is the lowest, while inventory holding cost is the highest cost. In crucial moment 2008, the low order processing cost is compensation from the higher inventory cost, as a effect so many investor, who has not active transaction and choose not active in trade exchange, so in one side inventory cost increase, and the other side order processing cost decrease.

If we compared with the normal situation in 2007, show that transaction cost dominated with adverse selection cost, than inventory holding

Table 4. Spread Decomposition according to Stoll (1989) Model

Cost Parameter	2006	2007	2008	All Data
Adverse Selection	0.7327	0.7783	0.5853	0.7031
Inventory Holding	0.3218	0.1568	0.7579	0.4934
Order Processing	-0.0545	0.0649	-0.3433	-0.1965

Table 5. Spread decomposition using Huang and Stoll (1997) Model

Cost Parameter	2006	2007	2008	All Data
Adverse Selection	0.5792	0.6594	0.5939	0.5069
Order Processing	0.4208	0.3406	0.4061	0.4931
Sig	0.2628	0.0242	0.1843	0.9221

cost and order processing cost. Similar in 2006 adverse information cost is the highest cost, follow with inventory holding cost and decrease order processing cost. Compare with 2006 and 2007, adverse information cost in 2008 is the lowest, it show that during the crucial, spread the publish information or private information is more open and spread fast, so decrease asymmetry effect. This result verify the early hypothesis that the highest cost component in Indonesian Stock Exchange is adverse information cost, but the inventory holding cost not suitable with the prediction.

Comparing the calculated result of spread decomposition use Stoll model (1989) with quote half spread and effective half spread models, there is a consistency result. The result of trading friction showed, during observation period (2006 – 2008) quoted half spread and effective half spread (both of them as total friction) increase, while the roll price, which reflect order processing cost is decrease, it's also with the result of spread decomposition, where the proportion of order processing cost is the lowest and negative.

Table 5 present spread decomposition used Huang and Stoll (1997). Based on this model, transaction cost will use to two cost type, order processing cost and inventory holding cost. This result consistence with the research

conducted before by Cai et al. (2008), Glosten (1994) who declared that the decrease friction and high informational friction in order driven market caused the market limit order book dominated with small trader, who profitable in small trade, but it frequently secretion or loss information from the informed trade.

Conclusions

The average trade friction generated in this study is 1% per year. Considering the stocks samples in this study are the high market capitalized stocks, which are scattered at various prices of friction, and then the friction of 1% per year is a friction generated at relatively liquid company. By defining trade friction as the constraints that are faced by investors in trading transactions which is implicit cost consists of real friction and informational friction, it can be seen that the highest trade friction are sourced from adverse information cost.

Based on the result of spread decomposition test using Stoll (1989) model, as well as hypothesis based on the earlier research, that the highest component transaction cost at the order driven market is adverse information cost. In general during observation period, order processing cost is the lower cost and it is consistent with trading friction estimator.

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