DOES PRE-OPENING SESSION IMPACT MARKET VOLATILITY AND LIQUIDITY?

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Abstract

On February 4, 2004, the Indonesian Stock Exchange (IDX) was implemented the changed its trading rules from continuous open to opening call, called pre-opening session. The purpose of this trading rules changed is to improve market liquidity. Previous study found that the opening call would reduce the volatility and spread at the opening call than the continuous open. These studies analyze market volatility and liquidity (trade base and order base) using intra-day data from the Indonesian Stock Exchange, where this market uses pre-opening session as the opening call. More than 100,000 transactions were used in this study with one- month period. The results of this study are contradicts to the previous studies. Using the opening call does not reduced market volatility, especially at the opening trade. The opening trade is more volatile then closing trade. Using the opening call do not impair on liquidity, especially for high volume stocks, based on trade or based on order. This phenomenon was contradicts to the conventional wisdom which suggests that thinly traded stocks is better in call trading method while the continuous auction method is preferred for heavily traded stocks.

Keywords: volatility, liquidity

Abstrak

Pada tanggal 4 Februari 2004, Bursa Efek Indonesia melakukan implementasi perubahan aturan perdagangan dari terbuka langsung menjadi *opening call*, yang disebut sebagai sesi pra-pembukaan. Tujuan dari aturan perdagngan ini adalah untuk meningkatkan likuiditas pasar. Penelitian sebelumnnya menunjukkan bahwa *opening call*, akan mengurangi volatilitas dan *spread* pada saat *opening call* hingga sesi pembukaan. Penelitian ini menganalisis volatilitas dan likuiditas (*trade base* dan *order base*) menggunakan data harian dari bursa efek Indonesia, dimana pasar menggunakan sesi pra-pembukaan sebagai (*opening call*). Lebih dari 100.000 transaksi digunakan dalam penelitian ini dengan periode satu bulan. Hasil dari penelitian menunjukkan kontradiksi dengan penelitian sebelumnya. Penggunaan *opening call* tidak mengurangi volatilitas pasar, khususnya pada saat pembukaan perdagangan. Pembukaan perdagangan lebih berfluktuasi daripada penutupan perdagangan. Penggunaan *opening call* tidak berdampak pada likuiditas, khusus pada saham dengan volume tinggi, berdasarkan pada perdangan dan pemesanan. Fenomena ini berlawanan dengan kebijakan konvensional yang menyatakan pada saham yang sedikit diperdagangkan adalah baik pada saat metode *call trading*, sementara metode lelang secara langsung baik untuk saham yang banyak diperdagangkan.

Kata kunci: volatility, liquidity

JEL Classification: G12, G14

1. Research Background

On February 4, 2004, the Indonesian Stock Exchange has implemented the changed its trading rules from continuous open to opening call, called pre-opening session. This opening call procedure was designed to maximize the trading volume. In the previous study (Comerton-Forde, 1999) when compared the opening procedures between the ASX and the IDX on the

period of 1995 to 1997 reports that the time taken to trade after the open is on average 27 minutes shorter on the ASX than IDX. It also reports that relative volume and trading frequency are 5% higher on the ASX than IDX in the first 10 minutes after opening. The relative spreads are also lower on the ASX. It seems that increasing on liquidity and lowering on volatility were enhanced by call market at the open. Furthermore, it suggests that the use of a call market at the open may increase to the efficiency of the IDX.

Should liquid stocks and illiquid stocks be traded in different trading rules? How the effect of trading rules on market volatility and market liquidity? These questions will be answered in this study as an important issues related to the market design. Some argues that since illiquid stocks was traded in the same trading rules with liquid stocks; illiquid stocks will always be a looser. Suggestion, illiquid stocks should be traded at a call market and liquid stocks should be traded at a continuous market. Under the call market (also known as periodic auction or clearing house), orders are batched for execution at a single price to maximize the number of shares traded, while under the continuous auction, orders are executed whenever submitted bids and offers cross during a trading sessions. This two trading method usually found in an order-driven market where traders submit orders before price are determined.

A number of important results emerge from this paper. Using the opening call does not reduced market volatility, especially for high volume stocks. High volume stocks are more volatile then low volume stocks. Using the opening call do not impair on liquidity, especially for high volume stocks, based on trade or based on order. These phenomenon contradicted to the conventional wisdom which suggests that thinly traded stocks is better in call trading method while the continuous auction method is preferred for heavily traded stocks. Furthermore, based on our results, this research suggest that pre-opening session doesn't impact on market volatility and market liquidity. The liquid stocks will always preferred at any kind of trading methods. The reminder of this paper is organized as follows. Section 2 provides a review of related studies. Section 3 presents IDX institutional background. Section 4 describes the data and research methods. Section 5 details and discusses the results and the last section concludes the paper.

2. Literature Review
2.1. Related Studies

One of the most important in market design of securities market is the trading rule at which market participants (i.e., liquidity suppliers and demanders) quote and trade. The primary difference between countries is whether they use a call market or continuous market, order-driven market or quote-driven market. A perfectly liquid market is one where any amount of given security can be instantaneously converted to cash and back to securities at no cost. In a less then perfect world, a liquid market is one where the transaction costs associated with this conversion are minimized.

The most common trading mechanism adopted by exchanges at these times of the day is a call opening. The pros and cons of the impact in changing the trading rules on liquidity had been pronounced. Whether Kling (2002) found evidenced that that liquidity is not depend on trading mechanism, some were not (Amihud, 1991; Chang, Rhee and Soedigno 1995; Chang et. al., 1999; Comerton-Forde, 1999; Aitken and Commerton-Forde, 2003; Comerton-Forde, et. al., 2007, etc.), which suggests that thinly traded stocks is better in call trading method while the continuous auction method is preferred for heavily traded stocks.

Commerton-Forde, et al. (2007) report that the introduction of the opening auction increased the relative volume traded at the start of the day for IPO firms without any significant impact on volatility and find a statistically significant reduction in bid ask spreads at the end of the trading day after the introduction of call trading. These results are consistent with the results of Rhee et al. (2004) who examine the same event using an alternative methodology. They analyze the impact of the introduction of the call auctions on inter-day return volatility measures.

They report a decline in return volatility and reduced negative correlations between trading day and overnight returns. This indicates reduced noise or improved price discovery in the trading process.

2.2. Institutional Background

Trading on IDX takes place five days a week (Monday to Friday). Trading hours are from 9:30 to 12:00 and 13:30 to 16:00 on Monday to Thursday and between 9:30 to 11:30 and 14:00 to 16:00 on Friday (the longer trading break on Friday allows the mainly Muslim population to comply with religious commitments to prayer). The IDX is a computerized and fully order driven market without any designated market makers or specialists. The IDX is also a highly transparent market. Market participants can see the entire limit order book and identify the different brokerages. Moreover, there are no "hidden orders" that are invisible to traders.

The IDX has three categories of trading boards: the Regular Board, Cash Board, and the Negotiated Boards. Regular Board orders must be in round lots of 500 units. These orders are matched continuously according to price and time priority. Orders may be amended or withdrawn prior to execution, but only limit orders may be entered. All orders expire at the end of each Trading Day, but it is still possible to enter the orders each morning before at the opening trading session at the next Trading Day.

For the period of study, the IDX use multiple tick sizes for different price categories. Table 1 shows the tick size for each price range, together with the median, minimum, maximum relative tick sizes. The IDX appears to maintain uniform relative tick sizes across different tick size. On February 4, 2004, the Jakarta Stock Exchange was implemented the changed its trading rules from continuous open to opening call, called pre-opening session. This call market system is designed to maximize the trading volume. The pre-opening session is between 9:10:00 to 9:25:00 for entering buy/sell order and between 9:25:01 to 9:29:59 JATS for performing the pre-opening price and allocating the executed transactions.

A step function tick size system is one of the key institutional features of the IDX. Table 1 shows the tick size for each price range, together with maximum price step. The IDX appears to maintain uniform relative tick sizes across different price categories.

Table 1. Multiple Tick Sizes on Indonesian Stock Exchange

Price Range	Tick Size	Maximum Price Step
< Rp200	Rp1	Rp10
Rp200 to < Rp500	Rp5	Rp50
Rp500 to < Rp2,000	Rp10	Rp100
Rp2,000 to Rp5,000	Rp25	Rp250
> Rp5,000	Rp50	Rp500

3. Research Method

This study used one-month period before and after pre-opening session was implemented with the 25 most active stocks in LQ45. The implementing of this new trading rule was divided into 5 time periods. Four stocks were implemented on February 5, 2004; 6 stocks were on March 8, 2004; 5 stocks were on March 23, 2004; 5 stocks were on April 6, 2004 and 5 stocks were on April 19, 2004. The data used in this study is taken from the JATS database maintained by the Database Pasar Modal Universitas Gajah Mada (DPMUGM). The JATS database provides details of all transactions and order books data.

The transactions and order books data set contains date transaction, date of settlement, stock identification, order number, price, volume, value, time, broker identity, broker origin (foreign or domestic), board type, and investor identification (foreign, domestic, and broker account. This study focuses on transaction and order on the regular market. Liquidity is measured by two based measurements: 1) trade based by four metrics: volume, relative volume,

total trading frequency, and value; 2) order based by four metrics: spreads, relative spread, depth, and relative depth. Volatility is measured by two metrics: return variance and price volatility (measured by coefficient of variant: CV).

4. Results and Discussion

The sample of 25 stocks represents approximately 80% of the volume traded on the IDX. Table 1 provides descriptive statistics about the average trading frequency, volume and value for two-month periods of the whole sample stocks, high volume stocks and low volume stocks for pre-and post-opening call. There are no significant different between high volume stocks and low volume stocks in number of trades and value. Whether in the sample stocks in this study divide into two categories, high and low volume, but all the samples in this study are the most liquid stocks (LQ45).

Table 2. Descriptive Statistics

Descriptive statistics of the average trading frequency, volume and value for two-month periods of the whole sample stocks, high volume stocks and low volume stocks for pre- and post-opening call.

	Trades	Volume	Value (Rp)
Whole sample stocks	39.4645	52,865.72	$8.75 \times 10^{+7}$
High volume stocks	52.5794	62,352.12	$8.8 \times 10^{+7}$
Low volume stocks	41.33978	39,661.51	$7,1 \times 10^{+7}$

Table 3 and Table 4 presents a comparison the liquidity measurement base on trade and order of the whole sample stocks, high volume stocks and low volume stocks for pre- and post-opening call. The tables also report the *t*-statistics for different trading rules in each liquidity measurement. These results demonstrate that there is significant effect in liquidity for high volume stocks. At the level of 1%, the opening call improved market liquidity, especially for high volume stocks. For the whole stocks there are no significant effects on market liquidity based on trade or based on order. This seems that changing in trading mechanism only impact on the high volume stocks. This indicates that High volume stocks had been always superior in any trading mechanism than low volume stocks.

Table 3. Liquidity Measurements Based on Trade

Comparison the liquidity measurements based on trade of the whole sample stocks, high volume stocks and low volume stocks for pre- and post-opening call.

	Before	After	Change	t-statistic
Whole sample stocks				
Volume	48,614.66	57,116.78	8,502.12	0.73
Relative volume	0.0006	0.0007	0.0001	1.24
Frequency	38.8254	40.1036	1.2782	0.56
Value	$7.5 \times 10^{+7}$	$1.0 \times 10^{+8}$	$2.7 \times 10^{+7}$	1.65*
High volume stocks				
Volume	25,201.64	54,121.38	28,919.75	6.70***
Relative volume	0.0004	0.0009	0.0004	4.71***
Frequency	27.1204	55.5591	28.4387	9.00***
Value	$5.8 \times 10^{+7}$	$8.4 \times 10^{+7}$	$2.5 \times 10^{+7}$	3.45***
Low volume stocks				
Volume	70,582.86	54,121.38	-16,461.5	−1.08
Relative volume	0.0008	0.0009	0.0001	0.58
Frequency	49.5996	55.5591	5.9596	1.60*
Value	$9.2 \times 10^{+7}$	$8.4 \times 10^{+07}$	$-8,2 \times 10^{+6}$	-0.75

* Significant at the .10 level; *** Significant at the .01 level.

Table 4. Liquidity measurements based on order

Comparison the liquidity measurements based on order of the whole sample stocks, high volume stocks and low volume stocks for pre- and post-opening call.

	Before	After	Change	t-statistic
Whole sample stocks				
Spreads	-11.1533	-10.1020	1.0513	0.351
Relative Spreads	0.0027	0.0011	-0.0016	-1.21
Depth	62,712.34	213,522	150,809.6	3.63***
Relative Depth	0.00003	0.00005	0.00002	2.67***
High sample stocks				
Spreads	-14.8233	-26.0816	-11.2583	-2.74***
Relative Spreads	-0.0068	-0.0088	-0.0020	-1.09
Depth	55,688.14	466,257.7	410,569.6	4.67***
Relative Depth	0.000008	0.0001	0.0001	4.98***
Low sample stocks				
Spreads	−9.1589	5.9605	15.1194	3.70***
Relative Spreads	0.0103	0.0110	0.0010	0.58
Depth	62,834.51	40,878.52	-21,956	-1.59*
Relative Depth	0.00004	0.00003	-0.00001	-1.54

* Significant at the .10 level; *** Significant at the .01 level.

Table 5 shows the comparison of the volatility measurement for each stock category based on trade. From this table there is a contradict result from the other result. Whether call opening can do improve the market liquidity but it can not reduce market volatility, but seems to be weakened. Only one of two volatility measurement is significant, i.e. Coefficient of variant (CV) at level of 5%. After opening call implemented is more volatile than before implementation, especially for high volume stocks.

The result describe that opening call didn't impact market liquidity and market volatility. The result of this study tends to confirm Kling (2002) that liquidity did not depend on trading mechanism. The high volume stocks tend to be the winner in any trading mechanism. Suggest that low volume stocks differentiate in trading rule than high volume stocks. The result of this study contradict with the other research that different in liquidity is because of different in trading mechanism (Commerton-Forde, 1999). The high volume stocks always the winner than low volume stocks. The liquid stocks will always preferred at any kind of trading methods.

Although this study show the conclusion remark of high volume stocks, but this study use the liquidity measurement base on trade and order in separately. Hope for the future research, using trade and order in the unity is a must. Combining data of trade and order will show the real time from order to execution. So, how fast the order is executed may a best measurement of liquidity.

Table 5. Volatility Measurements

Comparison the volatility measurements of the whole sample stocks, high volume stocks and low volume stocks for pre- and post-opening call.

	Before	After	Change	t-statistic
Whole sample stocks				
Return variance	0.0003	0.0078	0.0074	1.50
Coefficient of variant (CV)	0.0032	0.0050	0.0018	1.93**
High volume stocks				
Return variance	0.0005	0.0144	0.0140	1.43
Coefficient of variant (CV)	0.0005	0.0078	0.0036	2.01**
Low volume stocks				
Return variance	0.0002	0.0010	0.0007	0.91
Coefficient of variant (CV)	0.0023	0.0022	0.0001	0.58

** Significant at the .05 level.

Using the opening call did not reduce market volatility, especially for high volume stocks. High volume stocks are more volatile then low volume stocks. Using the opening call improve

liquidity only for high volume stocks, based on trade or based on order. This phenomenon was contradicts to the conventional wisdom which suggests that thinly traded stocks is better in call trading method while the continuous auction method is preferred for heavily traded stocks. Furthermore, based on our results, this research suggests that pre-opening session doesn't impact on market volatility and market liquidity. The liquid stocks will always preferred at any kind of trading methods.

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