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Liquidity and Volatility on Indonesia Stock Exchange (IDX): An Evidence of JSX and SSX Merger

Luluk Kholisoh
STIE Nusa Megarkencana,Yogyakarta, Indonesia

At the end of November 2007, Jakarta Stock Exchange (JSX) and Surabaya Stock Exchange (SSX) have announced their merger into Indonesia Stock Exchange (IDX) and it was applied on 1st December 2007. The merger would surely have positive impacts on the Indonesian capital market. As for importance of research in stocks' behavior, this study makes a first-pass attempt to provide an analysis of the impact of Indonesia capital market merger on liquidity especially on the level of firms' stock. This research used more than 350,000 intraday transactions data of 45 liquid stocks as LQ45. One statistical test, the parametric paired *t*-test is used to test whether the changes in the variables from pre and post of the merger are significant. The result shows no significant effect of merger on stock behavior in IDX, especially in the term of liquidity. The result contradicts from the theoretical wisdom and empirical research which suggests the capital market merger affects the stocks' performance positively, especially in liquidity in the level of the stock.

Keywords: market microstructure, liquidity, volatility, merger

Introduction

At the end of November 2007, Jakarta Stock Exchange (JSX) and Surabaya Stock Exchange (SSX) have announced their merger into Indonesia Stock Exchange (IDX) and it was applied on 1st December 2007. The merger would surely have positive impacts on the Indonesian capital market. The IDX Composite Index increased by 0.57% on 3rd December 2007 and continued increasing by 0.74% on 11 December 2007. Positive response followed by the listing of two companies at the middle of December 2007, i.e, Cowell Development Corp. with 250 million stocks offering and Asian Bond Fund Indonesia Bond Index Fund (ABF IBI Fund) as Exchange Traded Fund (ETF).

Merger between stock exchanges doesn't represent something new, especially at national level. The local stock exchanges in a country accept the merger between them in order to create a significant capital market at national level (Stoica, 2010). Intuitively, the capital market merger might affect the stocks' performance positively, especially in liquidity in the level of the stock. Liquidity is an important feature of capital markets. A better understanding of their changes may increase the credence of capital markets, investors, and listed companies. It must also be noted that many previous researches have documented that liquidity was associated with stock prices, trading activity, and returns' volatility. Hence, previous researches provided empirical

Luluk Kholisoh, Dr., Market Microstructure, Management Department, STIE Nusa Megarkencana, Yogyakarta, Indonesia.
Correspondence concerning this article should be addressed to Luluk Kholisoh, Griya Karang Gondang A-1, RT.013/RW.09, Pendowoharjo, Sewon, Bantul 55185, DI.Yogyakarta, Indonesia.

evidences in the different markets (Stoll, 1978; McInish & Wood, 1992; Aitken & Frino, 1996).

Liquidity refers to how quickly and how cheaply investors can trade an asset when they want to. Harris (1990) noted that a perfectly liquid market is one where any amount of a given security can be instantaneously converted to cash and back to securities at no cost. In a less than perfect world, a liquid market is one where the transaction costs associated with this conversion are minimized.

Understanding of the change in liquidity is also important from public and firms' policy point of view. Amihud and Mendelson (1988) argued that firms had incentives for the liquidity increase of the financial claims they issued since this might increase their values. Therefore, the decreasing liquidity in emerging markets may also induce corporations to cross-list their stocks in more liquid and developed markets, and thereby hindering domestic market development (Tandelilin, 2002).

The results of the analysis provide insights of the factors in which the observed differences in the periods before and after the Indonesian capital market merger can be attributed. It has important implications for investors to seek liquid assets in their portfolios. Despite of the importance of research in stocks' behavior, this study makes a first-pass attempt to provide an analysis of the impact of Indonesian capital market merger on liquidity especially on the level of firms' stock. The objective of this study is to highlight the changes in liquidity of the level of stocks in JSX before and after merge to become IDX.

The reminder of this paper is organized as follows. Sections 2-4 provide literature review, research method, and results and discussion. Conclusion of the paper is in the last section.

Literature Review

Merger is one of the strategies adopted by companies to develop and grow the company. Mergers derived from the word *mergere* (Latin), meaning (1) joined together, united, and combined; (2) causes a loss of identity because it is absorbed or swallowed something. Mergers are defined as a merger of two or more companies, and then there is only one company that survives as a legal entity, while others were suspended its activities or disband.

The theoretical wisdom suggests that merger creates wealth and capital market efficient and affects the stocks' performance positively, especially in liquidity in the level of the stocks. Merger between stock exchanges doesn't represent something new, especially at nationally level. The local stock exchanges in a country accept the merger between them in order to create a capital market significant at national level (Stoica, 2010). Empirical research has been examined and finds some evidence of the affects of merger on liquidity (Stoica, 2010; Nielsson, 2009). In Indonesia, some researches have studied the impact of the merger of two companies on performance and stock returns. Some researches such as Payamta and dan Setiawan (2004), Widjanarko (2006), and Wibowo and Pakereng (2001) found evidence that after the merger there is no significant increase in stock returns, especially to obtain a positive abnormal return.

Research Method

Data

The data used in this study are taken from the JATS database maintained by the Database Pasar Modal Universitas Gajah Mada (DPMUGM). The JATS database provides details of all orders and trades placed on the IDX. These records provide details of the number order, date, time, price, volume, buy/sell order, type of investor, and broker ID for every order and trade.

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[1] by referring to the JATS (Jakarta Trading System). On 4th February 2004, IDX (before is JSX) used pre-opening session in regular market as every exchange market. The pre-opening session is open from 09:10 to 09:25 to input the buying and selling orders from the members, and 09:25:01 to 09:29:59 to allow JATS process the pre-opening price forming and allocate every done transaction.

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 the opening trading session at the next Trading Day.

This study considers the period of two months before and after 1st December 2007, in which Indonesia Stock Exchange was applied. The 45 most active stocks (LQ45) that were listed two months prior 1st December 2007 at JSX and two months after 1st December 2007 at IDX are included. In order to compare the liquidity and volatility before and after the implementation of Indonesia Stock Exchange, it is necessary to determine the period of the study.

Liquidity and Volatility Measurement

A classical trading activity is measured using four different variables. Aitken and Comerton-Forde (2003) found approximately 68 measurements of liquidity and have not reached an agreement. This study used four metrics: trading volume (number of shares traded), relative volume (number of shares traded, divided by the number of shares on issue), frequency (the number trades), and value (value of shares traded). Volatility measurement is used in two metrics: Return variance and coefficient of variation (CV). Using differences in liquidity measurements provides insight of the appropriateness measurement.

Research Analysis

One statistical test, the parametric paired *t*-test is used to test whether the changes in the variables from pre and post merger to be Indonesia Stock Exchange are significant. The use of this test is common in testing the effect of event (some called event study). The test is divided by three categories: whole stocks, high volume stocks, and low volume stocks.

Results and Discussion

Statistical Descriptive

Table 1 reports the whole stocks, high volume stocks, and low volume stocks before and after the merger. Almost value of the volume, frequency, and value before the merger on average is almost higher than that after the merger period. It is necessary for statistical tests to determine the impact of the merger for liquidity.

[1] The longer trading break on Friday allows the mainly Muslim population to comply with religious commitments to prayer.

Table 1

Statistical Descriptive of the Sample Stocks

Variable	Before merger		After merger	
	Minimum	Maximum	Minimum	Maximum
Whole Stocks				
Volume	104,758	8×10^9	5,509,000	1×10^{10}
Frequency	1,268	128,230	464	95,692
Value	4×10^{10}	2×10^{13}	9×10^9	2×10^{13}
High Volume Stocks				
Volume	7×10^8	8×10^9	2×10^8	1×10^{10}
Frequency	9,242	128,230	5,491	95,692
Value	5×10^{11}	2×10^{13}	3×10^{13}	2×10^{13}
Low Volume Stocks				
Volume	104,758	1×10^9	5,509,000	9×10^8
Frequency	1,268	45,910	464	40,888
Value	4×10^{10}	1×10^{13}	9×10^9	9×10^{12}

Results

Table 2 presents the comparison of liquidity measurements based on trade for the whole stocks, high volume stocks, and low volume stocks. For all stocks categories there is no significant effect of the merger on liquidity and there is significant effect on decreasing in liquidity.

Table 2

The Liquidity Measurements Based on Trade of the Whole Sample Stocks, High Volume Stocks, and Low Volume Stocks for Pre- and Post-Merger

	Before	After	Change	T-statistic
Whole Stocks				
Volume	1,177,216,205	830,306,148	-346,910,057	-3.525
Relative volume	0.127624	0.079776	-0.047848	-3.638
Frequency	17,590	13,687	-3,903	-3.698
Value	2,468,504,849,994	1,766,424,178,703	-702,080,671,291	-4.072
High Volume Stocks				
Volume	3,221,880,406	2,292,266,548	-929,613,858	-3.170
Relative volume	0.204942	0.111806	-0.093136	-3.449
Frequency	33,651	25,301	-8,350	-3.054
Value	4,477,836,852,284	3,239,861,317,987	-1,237,975,534,297	-2.892
Low Volume Stocks				
Volume	298,171,830	195,082,944	-103,088,886	-3.188
Relative volume	0.083836	0.048860	-0.034976	-2.055
Frequency	10,776	8,732	-2044	-2.331
Value	1,621,780,604,641	1,135,577,040,284	-486,203,564,357	-3.026

Table 2 shows that all liquidity measurements have no significant results. These results prove that the merger actually lowered the Indonesian capital market liquidity, especially at the level of individual stocks. It's the suspicion that the use of total trade activity makes the results not in line with expectations, and this research also tests for the average activity. This is done to reduce bias caused by differences in the number of trading days in the periods before and after the merger. In the period before the merger, the transaction of the number of days was as much as 42 days while in the period after the merger there was 36 days.

Table 3
The Average Liquidity Measurements Based on Trade of the Whole Sample Stocks, High Volume Stocks, and Low Volume Stocks for Pre- and Post-Merger

	Before	After	Change	T-statistic
Whole Stocks				
Average volume	56,113,685	45,590,293	-10,523392	-2.268
Average frequency	834	855	23	0.415
Average value	117,117,539,605	96,726,168,985	-20,391,370,621	-2.551
High Volume Stocks				
Average volume	153,328,540	125,409,710	-27,918,830	-1,914
Average frequency	1,593	1,581	-12	-0.082
Average value	211,521,641,154	177,152,586,497	-34,369,054,657	-1.682
Low Volume Stocks				
Average volume	14,302,571	10,818,361	-3,484,210	-2.069
Average frequency	511	546	35	0.735
Average Value	77,319,710,538	62,156,876,987	-15,162,833,551	-2.041

Table 3 shows the result of the average of volume, frequency, and value. The results from this table have no difference from the results listed in Table 2. All measurements show no significant effect on increasing liquidity. Only an average frequency of trading after the merger showed an increase compared to the period before the merger, but not significant. Thus, the merger does not give a positive effect on the level of liquidity in the level of stocks.

Table 4 shows the volatility before and after period of the merger. The result finds the evidence that there is no significant effect on volatility on the average. Return variance for whole sample stocks and low volume stocks is statistically significant at level 5% and 10%.

Table 4
Volatility Measurements Comparison and the Volatility Measurements of the Whole Sample Stocks, High Volume Stocks, and Low Volume Stocks for Pre- and Post-Merger

	Before	After	Change	T-statistic
Whole Sample Stocks				
Return variance	0.000005	0.000002	-0.000003	1.628**
Coefficient of variant (CV)	0.039624	0.036863	-0.002761	0.341
High Volume Stocks				
Return variance	0.000008	0.000003	-0.000005	0.777
Coefficient of variant (CV)	0.039114	0.037160	-0.001954	0.117
Low Volume Stocks				
Return variance	0.000004	0.0000002	-0.000002	2.197*
Coefficient of variant (CV)	0.040449	0.037322	-0.003127	0.336

Notes. * Significant at 10% level; ** significant at 5% level.

Discussion

Although the results of this study contradict with theoretical wisdom and empirical research such as Ulf Nielsson (2009), but the merger would surely have positive impacts on the Indonesian capital market. The IDX Composite Index increased by 0.57% on 3rd December 2007 and continued increasing by 0.74% on 11 December 2007. Positive response was followed by the listing of two companies at the middle of December

2007, i.e., Cowell Development Corp. with 250 million stocks offering and Asian Bond Fund Indonesia Bond Index Fund (ABF IBI Fund) as Exchange Traded Fund (ETF). In the long run it seems to differ from starting point of merger. This study used two months period before and after merger and all liquidity measurements used in this study tend to be decreased.

Decreasing in volume, frequency, and value of LQ45 stocks doesn't mean in the long run liquidity will decrease. It might mean the period used in this study is too short and there are seasonal effects biases in results. Figure 1 shows this phenomenon. The average liquidity and return volatility sharply decline in December 2007 and tend to increase in January 2008. It seems that declining in liquidity and return volatility was caused by seasonal effect.

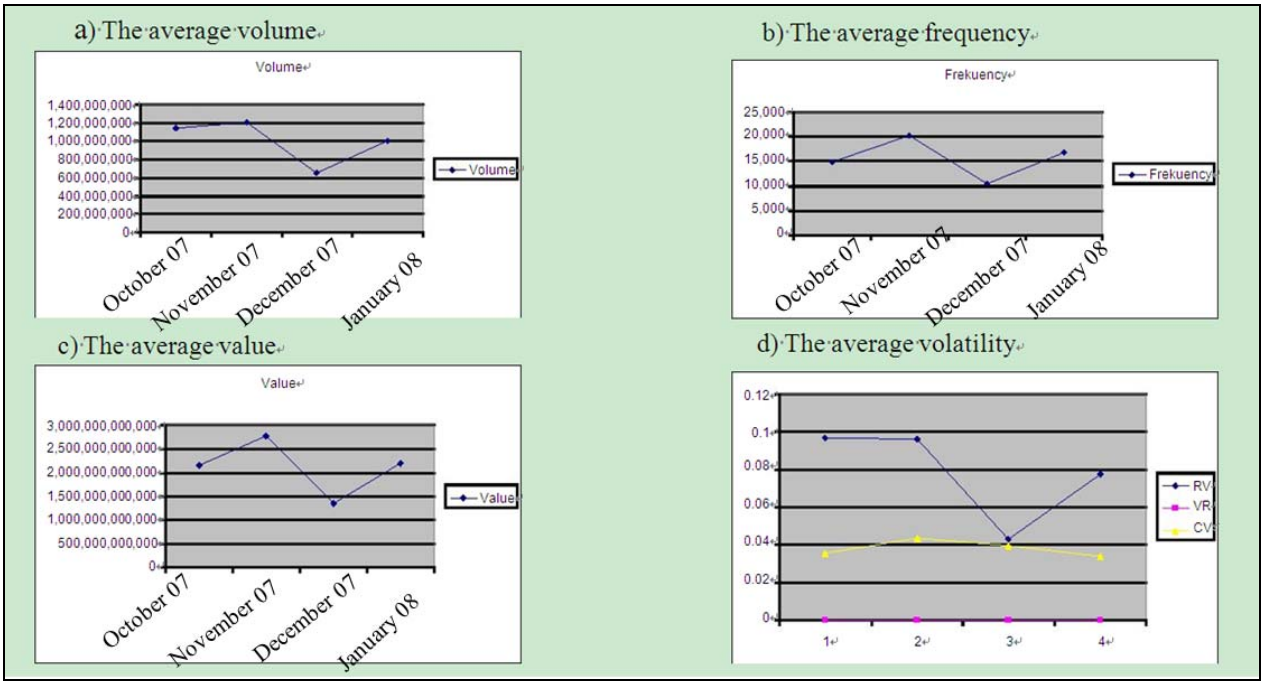

Figure 1. Liquidity and volatility measurement for over four month periods.

Conclusion

The results contradict from the theoretical wisdom which suggests the capital market merger affects the stocks' performance positively, especially in liquidity in the level of the stocks. However, the volatility in the rare was decreased. Not proven increasing liquidity in this study there may cause a relatively short observation in the period of two months before and two months after the merger. In addition, the period after the merger of observations in this research is two months in December and January, when relatively the trading activity is not too large, especially in December. This is because almost all companies perform year end closing book and not a lot of information released at the end of the year. In January 2008 it has shown an increase on trading activity, but not significant compared with October and November 2007. It might be that in the short run, the investor response to a merger is insignificant. Future research should be tested again for the effect of mergers on trading activities using longer periods and greater number of shares. Thus, the expected influence of the season can be avoided. However, for the era of globalization, the Jakarta Stock Exchange was supposed to merge with the

Surabaya Stock Exchange and became one stock exchange—Indonesia Stock Exchange.

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