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Indonesian Stock Market Efficiency Analysis Based on Abnormal Return and Trading Volume: Tapering Off Policy Evaluation

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Abstract: ***Federal Reserve made an announcement in tapering off their Quantitative Easing (QE) monetary policy on May 22, 2013. This policy made foreign investors withdraw their capitals from Emerging Markets. Indonesia is one of Emerging Market Countries that got their foreign capitals from Quantitative Easing policies. In turn, that announcement made investors in Emerging Market Economies (EMEs) lose their tolerance to risk. The purpose of this research is to analyze tapering announcement effect to return and trading volume for nine sectors of Indonesian Stock Market (IDX). We used event study methodology in conducting this research with data provided from daily price and volume consisted of three companies each sector. We found that tapering announcement give significant positive return before and significant negative return after the announcement. However, tapering announcement did not show significant return before and after event date at each sector. It shows that trading volume activity made a significant difference in two sectors (Finance and Agriculture). This research limited by only using three companies from nine sectors chosen by their market caps with no corporate event on event window. The result implicated that there is negative sentiment because of this announcement but the fact is there is no significant difference in return. Also, because of the event, there is a significant increase in trading volume at two sectors that implicate that those sectors had the biggest negative sentiment from the investors.***

Keywords: tapering, return, trading volume, Indonesian Stock Market

1. Introduction

In 2008, the global financial crisis made United States issued monetary policy called Quantitative Easing (QE). Through the policy, The Fed bought bonds issued by Freddie Mac, Fannie Mac, and Federal Home Loan Bank, including the purchase of asset-backed securities. It hoped that with that many cash reserves, those banks would not restore their liquidity balance using debt, therefore could stabilize the banking system and stimulate the economy (Lu 2013). US companies invested that money to many emerging market countries, which one of them is Indonesia. Post QE, The Fed starts to signal their plan for tapering. The expectation of tapering made tolerance reduction of risk and possible reduction of return in emerging market stock investment (Nechio 2014). The Fed issued QE1 in September 2008. This policy influenced JSX (Jakarta Composite Index) by value increased in the beginning of 2009. The next phase (QE2) issued in June 2011. This policy pushed JSX value again because after this policy issued, there is a large capital inflow to EME's such as Indonesia. But, there is also decrease of JSX in 2013 after reaching its peak in June 2012 because of QE3. This value decrease could be happened because of tapering off announcement by Federal Reserve on 22 May 2013. Tapering off gradually enacted from December 2013 till October 2014 (Rai & Suchanek 2014).

JSX itself gives a picture of stock market development and could be a guideline in investing. Companies that were incorporated within JSX are 506 companies in 2014. Within JSX there is a variety of index. The Index is created to facilitate investors in making their stock portfolio. One of that indexes is sectoral index. This index clustered each company by their industrial categories in each sector. Sectors that exist within Indonesian Stock Market are Agriculture, Mining, Miscellaneous Industry, Basic Industry, Property, Consumer Goods, Infrastructure, Trade and Service, and Finance (IDX 2016).

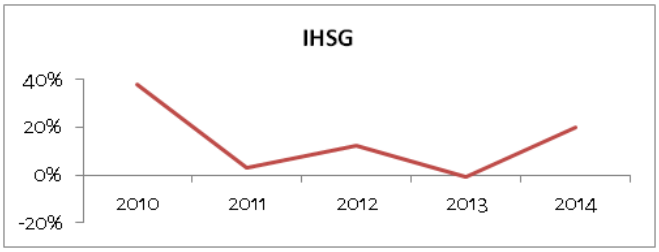

Figure 1: JSX Return Fluctuation 2010-2014 (Source IDX: data processed)

Figure 1 shows return fluctuation of JSX. From the period of 2011 till 2013, there are decreases of return that could happen because of tapering announcement.

1.1 Problem Formulation

Indonesian Stock Market ones hold the status of semi strong efficiency within Efficient Market Hypothesis (Husnan 1998 in Imelda *et* al. 2014). It means that investors could not predict stock prices by historical pattern and public information. But, based on historical data that we had shown

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before, there is return and value decrease of JSX. Because of that, we had a few question:

1) Is tapering announcement gives significant influence in the reduction of return for each sector within Indonesian Stock Market?
2) Is tapering announcement have significant influence in trading volume activity fluctuation for each sector within Indonesian Stock Market?
3) Which level of efficiency is Indonesian Stock Market?

1.2 Research Purpose

1) Analyze the influence of tapering announcement toward the stock return for each sector in Indonesian Stock Market within each date and analyze the return difference between before and after the event.
2) Analyze the influence of tapering announcement toward trading volume activity for each sector in Indonesian Stock Market within each date and analyze the return difference between before and after the event.
3) Analyze the level of Indonesian Stock Market efficiency.

1.3 Research Scope

Research restricted in analyzing abnormal return and trading volume activity for three companies within nine sectors of JSX.

2. Research Method

2.1 Data and Data Source

The type of data used is secondary data. Those data are time series from investors transaction. Data taken are from three companies chosen from nine sectors within BEI. We then took daily transaction data from those 27 companies sample. Thus, all data taken are from daily data from 110 days before and 10 days after tapering announcement.

2.2 Actual and Market Return Calculation

Actual return is the real return and we calculated it daily during estimation and event period. The Capital gain could be obtained when the present stock price is higher than the previous day. On the contrary, when the present stock price is lower, then it became the capital loss. We could calculate this return with a simple calculation. Amenc & Le Sourd (2005) claimed that actual return could be calculated using mathematical calculation and if possible, plus dividend. The requirement for the companies that used for this research is it doesn't have a compounding effect, thus we could ignore dividend in its calculation. Market return calculation similar to the actual return, the difference is by using JSX as its component.

2.3 Market Model

The Market model used to calculate expected return or normal return. This return calculated using market model formula (MacKinlay 1997):

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Notes,

R_{it} = expected return stock index i day t
α_i = stock i intercept
ε_{it} = error term
βi = stock i beta
R_{mt} = market return

The Market model is a better model than Constant mean return model because this model ignores return portion related to the variation that exists in market return so it could decrease abnormal return variation. It means that this model is more sensitive in detecting the effect of one event (MacKinlay 1997).

2.4 Trading Volume Activity (TVA)

Trading volume level within event window calculated using Trading Volume Activity (TVA) (Gunaasih & Nursasmito 2015). The formula is:

$$TVA = \frac{stock\ x\ trade\ in\ day\ h}{total\ outstanding\ stock}$$

2.5 Research Hypothesis

Abnormal return calculated so we will get AAR (Average Abnormal Return). Before we do a further calculation, we test AAR and TVA to see its significance toward tapering event. These test used the confidence level of 90% with its hypothesis:

H1
H0: AAR = 0
H1: AAR ≠ 0

H0 means that there is no difference of stock AAR between before and after tapering event. Vice versa, H1 meant that there is a difference in stock AAR between before and after tapering event. TVA result also used the same test with hypothesis

H2
H0: TVA = 0
H1: TVA ≠ 0

3. Result and Discussion

3.1 Chosen Companies for Each Sector

This research chose three companies with the largest value of capitalization within each of 9 sectors. Capital value became the reference in choosing these companies because it shows companies size. But, it is not the only factor that we used. One of the requirements in research using event study method is there is no compounding effect that could affect our analysis. Corporate events such as General Meeting of Shareholders, Outstanding General Meeting of Shareholders, dividend payment, and stock split belong to compounding effect. According to that consideration, then companies that fall under our categories are companies with the largest capitalization value and had no corporate event during the event period.

3.2 Normality Test

Ideal data are data that had a normal distribution. A statistical method such as regression, correlation, t test, etc can be used

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only with the assumption they have a normal distribution (Ghasemi & Zahediasl 2012). The larger the size of the sample, then the more we can assume those data have a normal distribution. The size of the sample that had normal distribution meant that the sample mean equal population means. To find out our sample had normal distribution or not, first, we must test it. Normality tests that we used are Kolmogorov-Smirnov and Shapiro-Wilks (Field 2009). These test recommended for research with sample size under 50 (Ghasemi & Zahediasl 2012).

AAR data each sector before and after event had pass Kolmogorov-Smirnov and Shapiro-Wilks test. According to those test, data for each sector had p value > 0.05. It means that it had normal distribution, and meets the requirement for t test. But, one sector, which is Agriculture sector did not meet the requirement with p value < 0.05. Thus, t test of Agriculture sector replaced with non-parametric sign test. Sign test used to test whether there is a difference between two correlated samples, but sign test did not show the magnitude of difference. The advantage of this test is it is simpler in determine the difference (Field 2009).

3.3 AAR and CAAR Tapering Announcement

During event window, the highest significant AAR value achieved nine days before tapering announcement (0.0180) and the lowest significant at nine days after it (-0.0149).

Table 1: AAR and CAAR tapering announcement

Days	*AAR*	*CAAR*	*t-value*	*Sig. (2-tailed)*	*Conclusion*
H+10	0.0028	0.0118	0.4680	0.6437	Not significant
H+9	-0.0149	0.0090	-4.0985***	0.0004	Negative Significant
H+8	-0.0086	0.0239	-1.8048*	0.0827	Negative Significant
H+7	0.0151	0.0324	3.0964***	0.0047	Positive Significant
H+6	0.0034	0.0173	0.5865	0.5626	Not significant
H+5	0.0014	0.0140	0.7752	0.4452	Not significant
H+4	-0.0039	0.0125	-1.0471	0.3047	Not significant
H+3	0.0032	0.0164	0.7942	0.4343	Not significant
H+2	0.0020	0.0132	0.6347	0.5312	Not significant
H+1	-0.0118	0.0113	-2.3456**	0.0269	Negative significant
Tapering	-0.0019	0.0230	-0.0497	0.9608	Not significant
H-1	-0.0085	0.0249	-1.0234	0.3155	Not significant
H-2	0.0040	0.0284	1.0678	0.2954	Not significant
H-3	-0.0066	0.0244	-1.2225	0.2325	Not significant
H-4	-0.0084	0.0310	-0.7222	0.4766	Not significant
H-5	0.0035	0.0344	0.9014	0.3756	Not significant
H-6	0.0003	0.0309	0.1910	0.8500	Not significant
H-7	0.0018	0.0306	0.1917	0.8495	Not significant
H-8	0.0023	0.0288	0.5317	0.5994	Not significant
H-9	0.0180	0.0265	5.0270***	0.0000	Positive significant
H-10	0.0085	0.0085	1.9449*	0.0627	Positive significant

Notes:
*** : significant at 1%
** : significant at 5%
* : significant at 10%

This event also causes significant abnormal return at level of 5% a days after the announcement and seven day after. AAR positive significant before event shows that market had anticipated The Fed announcement. Schweitzer (1989), and Arulvel *et al*. (2011) states that market reaction that happens before D day indicate the presence of trading insider that could anticipate the event. The event that gives significant abnormal return during event period shows the existence of reaction in BEI. Information before the announcement had a positive reaction and we could say it as a good news (H-9, positive significant). But, a day after the announcement there is a negative significant AAR that shows market had an apathetically reaction. The market had its positive reaction six days after the negative reaction, but the day after, it turns back to negative return in H+8 and H+9. As a whole, firstly market had a positive reaction to the event, in connection with the hope for the Fed conference on 22 May that still in the scope of the third QE policy. A paper written by Fic (2013) state that there is positive economic growth in the US when QE3 issued since September 2012, that made the possible expectation of the policy continuation. Contrary, after the announcement, market react negatively. Activities in carrying out unconventional monetary policy able to give diverse significant reaction towards international stock market (Wang & Zhu 2013).

The announcement that happened at D day did not give a significant abnormal return. Significant result happened after the announcement (negative significant) that could be a sign there is a delay of investors reaction. Murogi (2014) states that significant reaction after D day shows market rather slowly in response an event. Abnormal return not only happened once after D day. H+7 and H+9 each had a significant abnormal return. But, it varies positively and negatively. This variation shows volatility in return. Veronesi (2000) and Agrawal *et al*. (2004) opine that return volatility indicates uncertainty in companies condition in the future. Murogi (2014) states that the total of a period in event window caused the difference in abnormal return. Longer event window enables more information or another event to enter the market and made a variation of positive and negative significant reaction.

For investors that invest their capital fundamentally, this announcement did not give much influence to return. CAAR value which is an accumulation of abnormal return always had a positive trend. If investors did not sell their stock during the event period, they still got a positive return.

3.4 Difference test for AAR and TVA each sector

Difference test is to see the difference before and after tapering announcement. The result of this test could be seen in Table 2.

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Table 2: Difference test of AAR for each sector before and after tapering announcement

Num	Sector	t value	Sig. (2-tailed)	Conclusion
1	Miscellaneous Industry	-1.4541	0.1798	No difference
2	Consumer Goods	2.2309*	0.0526	Significant difference
3	Finance	0.1871	0.8556	No difference
4	Basic Industry	1.5448	0.1567	No difference
5	Trade and Service	1.1460	0.2813	No difference
6	Mining	0.8920	0.3956	No difference
7	Agriculture	-0.0087	0.9932	No difference
8	Property	-0.4703	0.6493	No difference
9	Infrastructure	-0.1655	0.8721	No difference

The result of the AAR shows almost all sector had no difference in abnormal return between before and after tapering off announcement, except in Consumer Goods sector. Thus, we can conclude that market did not react to much either in positive response or negatively, it means that for each sector, companies that became the representative did not affected much by the announcement. Meidawati & Harimawan (2004), states that one event could give negative or positive sentiment to investors, but the trade did not always follow by profit that to be expected, or the investment yet to bear profit. According to the result, we reject hypothesis 1 that states there is no difference in AAR before and after tapering announcement because there is difference in Consumer Goods sector. This result analogous with research by Purnasari (2016) which research includes event that influenced particular sector. But, it contradicts research by Murogi (2014) and Nokowati (2016) that states there is no difference of AAR between before and after an event that occurs extensively influencing stock market.

The next result used the movement of trading volume or TVA (Trading volume activity). TVA is an another indicator beside AAR and CAAR in seeing investors behavior at stock market. TVA values collected by each company and we average it to get TVA each sector. Next, we tested TVA value by using difference test t-test with confidence interval of 95%. The result could be seen in Table 3.

Table 3: Difference test of TVA for each sector before and after tapering announcement

Num	Sector	t value	Sig. (2-tailed)	Conclusion
1	Basic Industry	-0.8369	0.4243	No difference
2	Consumer Goods	1.7567	0.1128	No difference
3	Finance	-3.2808***	0.0095	Significant difference
4	Basic Industry	0.8636	0.4102	No difference
5	Trade and Service	-0.8821	0.4006	No difference
6	Mining	-0.4432	0.6680	No difference
7	Agriculture	-2.7997***	0.0207	Significant difference
8	Property	-1.4505	0.1809	No difference
9	Infrastructure	-1.1156	0.2935	No difference

Almost all sectors did not give significant result. It means that tapering announcement did not influence trading activity in almost of all sectors. But, two sectors which are Finance and Agriculture react differently. It is analogous with research by Gunaasih & Nursasmito (2015), that states other country policy that influenced globally can affect trading level in BEI. These sectors had a fluctuation of trading level before the event. But, sharp increase happened after 22 May, especially in Finance sector. BI (2014a) and BI (2014b) state that global economic condition is less conducive in main export countries for commodities. It decreases demand and lowering the export performance for the commodity. Besides that, there is a signal in reduction of the Fed stimulus, that lowering liquidity intake to Indonesia. Thus, the decrease of capital flow also causes the decrease of Rupiah exchange rate and financial market performance. Negative perception continues to grow along with inflation expectation and increase of current account deficit.

3.5 Managerial implication

Tapering announcement is a part of the third QE policy by Federal Reserve. It did not significantly influence return difference for almost all sector during before and after announcement. It influenced trading volume in Financial and Agriculture sectors and trading return as a whole. Thus, we can conclude implication for stakeholder within stock market

Investors. Tapering announcement made significant negative return, but there is no difference in return between before and after announcement except for Consumer Goods sector. Trading volume had significant result during event period. It means that Indonesian investors either foreign or domestic had a negative view towards the announcement. Investors predict the decrease of return and sold it in hope that they did not get any loss. Investors shouldn't hastily sell their capital, or if there'll be similar event because almost all sectors did not give significant result.

Companies: Tapering announcement influenced significantly in trading level of two sectors, which is Finance and Agriculture and also significantly influenced return in Consumer Goods sector. Companies of these three sectors recommended to keeping stabilized their stock price to anticipated change that happened because of the event.

Financial Service Authority of Indonesia (OJK): Tapering off is an event that gives negative sentiment in BEI. Government especially OJK as monetary regulator recommended to issuing policy that can stabilize companies stock prices because basically there is no difference in return during event window between before and after tapering announcement except in Consumer Goods sector.

4. Conclusion and Suggestion

4.1 Conclusion

1. According to data formulation, AR shows positive and negative result between before and after event. But, there is no difference in AAR before and after in each sector except in Consumer Goods. As a whole, this event influenced BEI. In each sector, the event did not give much influenced. Accumulation of AAR and CAAR always positive even if there is a fluctuation of return. Investors still get positive return when they invest during event period, even if negative significant return exists.

2. Generally, tapering announcement did not affect trading activity, but two sectors affected by it. It affects it by increase in trading activity in those sectors. This increase shows that this event is not a good news for investors in those two sectors.

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3. BEI level is at inefficient semi strong. Because abnormal return still exists during event.

4.2 Suggestion for Future Research

The next research should be researching another event such as policy implemented by monetary authority of Indonesia or of a neighboring country e.g. how this should affect the stock market of Indonesia (IDX). Other example are the next research could be researching about event issued another country that influence extensively.

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