

Effects of The Japan Disaster 2011 on the Stock Return and Trading Volume in Indonesia Stock Exchange

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Abstract

This study aims to analyze international disaster event on the capital market activities, especially on the Indonesia Stock Exchange. Researcher analyzed the market reaction to the Japan disaster on March 11, 2011. This research using the data 45 companies (LQ-45) in Indonesia Stock Exchange and the event date is ten days before and ten days after the disaster. From the analysis showed that the event is not significantly affecting the stock return and trading volume activity between pre and post the event. These result indicate that the Japan disaster give no impact to the investor on Indonesia Stock Exchange.

Keyword: *Japan disaster, capital market, Indonesia Stock Exchange*

A. INTRODUCTION

As one of economic instruments, the movement of capital markets is strongly influenced by any kinds of information. There are some information that comes from events both in the economic and non-economic environment. One of the non-economics information that closely related with economic condition is the issue of safety and political stability. Those factors, whether direct or indirectly, will influence the performance of economic in the country through the capital market.

Even the issue is indirectly affecting the capital market, the information will be accepted by investor as a consideration to make investment decision. It is relevant because the more stable political and safety condition, the lower the risk investor faces and the better the performance of the economy of a country. With the same token, chaotic conditions will increase the risk and thus make the economy worse. (Suryawijaya & Setiawan, 1998)

Recently, Japan was hit by earthquake followed tsunami on Friday 11 March 2011. Japan is the most powerful country in term technology and economic in Asia. After the disaster, many expert worries about the effect, in term of economic condition, in some countries that have relationship with Japan. Reported that after the disaster in Japan, big automotive industry, makes the Europe demand for nylon is breaking down and the price for acrylic acid moved up. Unfortunately, besides economic effect, Japan faces new problem of socio-life that is nuclear disaster. From the evidence, people can see how big the effect of the Japan disaster to the world economic condition.

The disaster information is correlated with safety stability. Even though Indonesia is not categorized as the big country in term of economic, it still has relationship on the investment and export-import activity with Japan. After the disaster, how the event will impact to the market condition in Indonesia? This research aims to analyze the market reaction in Indonesia stock exchange after the event of Japan disaster.

1. Previous Research

Some scholars have been examining the effect of disaster to market condition. Hill and Schneeweis (1983) analyzed the effect of nuclear accident on Three Mile Island to the stock return of public utility firms. They found that the effect of the nuclear accident on nuclear based company is higher than non-nuclear utilities. Kalra, Henderson, & Raines (1993) found that Chernobyl marked the start of a new era for nuclear power in United States and the stock market quickly recognized the consequences for utility stocks, as the impact of market reaction in United States after the events of Chernobyl nuclear accident in Russia. Shelor, Anderson, & Cross (1990) tried to find the effect of California earthquake on the stock value of firms in the real estate industry. The study showed that the

earthquake drives significant negative stock returns among those firms operating in the area hit by the earthquake, but in other areas outside the earthquake was not. Angbazona (1996) found that Andrew Hurricane and the related regulations had industry-wide contagion effect since they significantly affected most insurers, regardless of whether these firms had any loss exposure in the hurricane affected places. Carter & Simkins (2004) investigated the September 11th attacks to the airline stock price in United States.

In Indonesian cases, Danupranata & Wahyoto (2003) analyzed the effect of J.W. Marriot Bombed to the market return and trading volume activity. Hamidi (2008) investigated the effect of flood in Jakarta to the stock liquidity of Chemical Industry. Farisi (2006) investigated the relation of the post Bali Bombed and increasing of gasoline price to the market price.

B. THEORETICAL REVIEW

1. Event Study

Event study is the technique of econometric used to estimate and draw inferences about the events effect in a particular or over several periods (Serra, 2002). Event study focuses on the impact of types of event on the price affected firms' securities, and this event studies provide the direct test to know market efficiency (Brown & Warner, 1980). The hypothesis of event studies starts on how an event affect value of the company and the abnormal return is the reflection of the changing of company value (Serra, 2002).

The purpose of event study as mentioned by Kritzman (in Suryawijaya & Setiawan, 1998) is to measure the relationship between events that affect return of these securities. In addition, event study can also be used to measure the impact of economic events on firm value.

Lamasigi concluded that the event study was developed to analyze the market reaction to an event, whether economic or noneconomic events, in order to determine whether there is abnormal return obtained by shareholders or not. The usage of event study in the last two decades was developed to the non-economic factor instead of economic (Suryawijaya & Setiawan, 1998).

2. Efficient Capital Market

The idea of efficient capital market was developed independently by Paul A. Samuelson and Eugene Fama in 1960s (Lo, 2007). Efficient capital market is a condition when the price reflects all of the available information. a market can be called efficient if no one, individual or institution investor, gains abnormal return. The key point of the efficient market idea is the information that affects market that reflects in the changing of stock price. (Gumanti & Utami, 2002).

Haugen (in Gumanti & Utami, 2002) divided the information into three categories; (a) information of stock price history, (b) all public information (c) all available information including private information. Jones (1998) stated that the current price of stock is reflects two kinds of information, which all of them are tend to financial information. First information is known, and the second is information needs to be predicted. Known Information is divided into two kinds; past and present. The information of profit and dividend is a good example of known information. The example of predicted information is changes in rate.

There are four conditions to have an efficient market. (a) Investor is a rational investor who analyze the market price, (b) Information is free and easy to get (c) random walk information (d) fast response from the investor regarding the new information which enters the market (Gumanti & Utami, 2002).

From the definition, there are differences of explanation from the expert about the categories of efficient market hypothesis. According to Fama (1970) efficient market can be categorized into three forms, weak, strong, and in between. Unlike Fama, West (1975) categorized it into two, operationally or internally efficient market and price or externally efficient market. The other side, (Beaver, 1986:130) explain the definition of efficient market from the information distribution point of view. This definition try to explain that price in the capital market is the reflection from the comprehensive understanding about the information. So, if the price contains information, the price formed is reflecting all information system.

3. Expected Return and Abnormal Return

Jogiyanto (2008) defined expected return as an expectation from investor to gain the return of the investment. It will be one of the

considerations from investor to make the investment decision (Nurheini, 2009). Brown & Warner (1980) explained that there are three approaches to calculate expected return; Mean-adjusted Return Model, Market Model, and Market-adjusted Model. In this study, the calculation of expected return is using the Market-Adjusted Model. This is to convince that the reaction that occurs is a result of events that were observed, not caused by the other events that could affect the events that would be observed. Moreover, since the study using purposive sampling method by specifying criteria sample, the market adjusted-model is to avoid the decreasing sample selection.

Abnormal return is the return earned by investors which does not fit the expectations. Abnormal return is the difference between the expected return and actual return. Actual return is a return that happens at the time-t which is the current difference in price relative to the previous price, while the expected return is the return of expectation of the investment. The abnormal return will be positive if the actual return is greater than the expected return. At the other side, the return will be negative if the return is less than the expected return.

Abnormal returns can occur because of events that correlated with economic or non-economic. For example, national holiday, the political condition, extraordinary events, disaster, stock splits, initial public offering of stock, and others.

4. Trading Volume Activity (TVA)

TVA is an instrument that can be used to view the stock market reaction to information via the parameter volume of shares traded in the market. McDowell (in Foejisanto, 2010) argued that TVA is the number of shares or securities traded in capital markets during the given period. Investors can find indicator out what is really happen in the capital market. TVA approach is used to test the hypothesis of weak-form market efficiency. This is because the state of the market, price changes does not immediately reflect the information available, so that researchers just observe the reaction of capital markets through the movement of stock trading volume on the market researched. (Nurhaeni, 2009)

5. Hypotheses Formulation

H_1 : There is difference in average abnormal return before and after the disaster Japan 2011.

H_2 : There is difference in average trading volumes activity before and after the disaster Japan 2011.

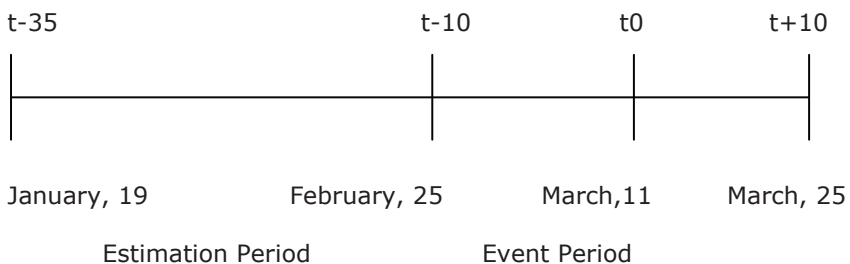
C. RESEARCH METHOD

This research was conducted using event study method. It studies the market reaction to the event that the information is published (Jogiyanto, 2000). The selected event is Japan disaster 11 March 2011. This research was conducted to test the market reaction in the form of stock trading activity and the level of profit share. The variables studied were the trading volume activity of stock and the level of abnormal return.

1. Event Identification

Japanese tsunami disaster occurred on Friday afternoon on 11 March 2011. Many observers assumed that this would give the economic impact of Japan is one of the developed countries which are economically and politically influential in the international arena. Expert was worried about the impact of the disaster in the national economic condition.

Since the research is to examine whether the Japan disaster (event) affect to the return and trading volume activity, thus the research decide the event period that are taken from the ten trading days prior to the event ($t-10$) to ten trading days after the event ($t+10$).



2. Population and Sample

Population is the generalization which consists of objects or subjects that have a certain quantity and characteristics established by research to be studied and then draw the conclusion. In this study, the population is all companies included in the LQ-45 index in Indonesia Stock Exchange (IDX). The company data are obtained from the list of companies that have been published. The sampling technique used is purposive sampling, which means that the population to be sampled is the population studies that meet certain criteria of the sample stated by researcher. Samples taken are companies listed in Indonesia Stock Exchange (IDX) included in the group of LQ-45 during the study period from January 11, 2011 – March 28, 2011 and actively traded during the study period.

3. Data Source

Data to be used in this study are secondary data consists of:

- a) Date of occurrence and date of publication of the samples obtained from the mass media events.
- b) The number of stock of each company that circulated around the event date Japan disaster March 11, 2011.
- c) Daily stock price of each company around the date of the event of Japan disaster March 11, 2011 . The stock price used is the closing price.
- d) Daily stock trading volume of individual companies around the event of Japan disaster March 11, 2011
- e) Composite Index (IHSG) during the study period.

Table 1: List of Company Code and Name

Code	Company Name
AAJI	Astra Agro Lestari Tbk.
ADRO	Adaro Energy Tbk.
ANTM	Aneka Tambang (Persero) Tbk
ASII	Astra International Tbk
ASRI	Alam Sutera Realty Tbk.
BBCA	Bank Central Asia Tbk

BBKP	Bank Bukopin Tbk.
BBNI	Bank Negara Indonesia (Persero) Tbk
BBRI	Bank Rakyat Indonesia (Persero) Tbk.
BBTN	Bank Tabungan Negara (Persero) Tbk.
BDMN	Bank Danamon Indonesia Tbk.
BJBR	Bank Pembangunan Daerah Jawa Barat
BMRI	Bank Mandiri (Persero) Tbk.
BNBR	Bakrie & Brothers Tbk
BRAU	Berau Coal Energy Tbk.
BSDE	Bumi Serpong Damai Tbk
BTEL	Bakrie Telecom Tbk
BUMI	Bumi Resources Tbk
CPIN	Charoen Pokphand Indonesia Tbk
DOID	Delta Dunia Makmur Tbk
ELSA	Elnusa Tbk
ELTY	Bakrieland Development Tbk
ENRG	Energi Mega Persada Tbk
GGRM	Gudang Garam Tbk
GJTL	Gajah Tunggal Tbk.
INCO	International Nickel Indonesia Tbk.
INDF	Indofood Sukses Makmur Tbk
INDY	Indika Energy Tbk
INTP	Indocement Tunggul Prakasa Tbk
ISAT	Indosat Tbk
ITMG	Indo Tambangraya Megah Tbk.
JSMR	Jasa Marga (Persero) Tbk
KLBF	Kalbe Farma Tbk
LPKR	Lippo Karawaci Tbk
LSIP	PP London Sumatra Indonesia Tbk.
MEDC	Medco Energi International Tbk
PGAS	Perusahaan Gas Negara (Persero) Tbk.
PTBA	Tambang Batubara Bukit Asam (Persero)
SMCB	Holcim Indonesia Tbk.
SMGR	Semen Gresik (Persero) Tbk
TINS	Timah (Persero) Tbk.
TLKM	Telekomunikasi Indonesia (Persero)
UNSP	Bakrie Sumatra Plantations Tbk.

UNTR	United Tractors Tbk.
UNVR	Unilever Indonesia Tbk.

4. Research Variables

Based on the main issues and hypotheses, the variables to be studied include:

Dependent Variable:

- a. Level of stock return.
Stock return rate will be measured by abnormal returns. Abnormal return is the excess of the actual return to a normal return or expected return. Abnormal return is used to determine whether or not Japan's catastrophic events affect the level of return.
- b. Trading Volume Activity (TVA).
Stock trading volume is measured by looking at trading volume activity indicators, hereinafter referred to as TVA. TVA is used to see whether Japanese catastrophic events affect investors' decision to trade which is different from normal trade, so that will get abnormal return.

Independent Variables

The independent variable of this study were Japanese catastrophic events on March 11, 2011 against the Indonesia stock exchange.

a. Abnormal Return

Abnormal return in this study is defined as the difference between the actual returns investors earned at the time of an event and expected return of investors in the event. Mathematically abnormal return is expressed as follows:

Where:

$RTN_{i,t}$ = Abnormal Return security i at period-t

$R_{i,t}$ = Actual Return securities i at period-t

$E [R_{i,t}]$ = Expected Return for the event period

b. Expected Return

Expected return is defined as an expectation from investor to gain the return of the investment. In this study, the calculation

of expected return is using the Market-Adjusted Model. This is to convince that the reaction that occurs is a result of events that were observed, not caused by the other events that could affect the events that would be observed. The formula:

Where:

$E [R_{i,t}]$ = Expected return from security to-I at period-t

$R_{M,i,t}$ = Market Return i in the estimation period t

c. Market Return

This study uses data composite index (IHSG) as the market return. (Meidawati & Harimawan, 2004)

Where:

R_{Mt} = market return in period t

$IHSG_t$ = IHSG index on day t

$IHSG_{t-1}$ = IHSG on the previous day.

d. Calculating the average abnormal return of all stocks sampled before and after the event.

And

Where :

ARbefore = average abnormal return before event

ARafter = average abnormal return after event

AR before = abnormal return before event

AR after = abnormal return after event

t = time period

e. Calculating the average standard deviation of returns before and after the event.

and

Where:

σ before = standard deviation of abnormal return before the event

σ after = standard deviation of abnormal return after the event

t = time period

f. Calculating the statistical t-test (at significant level $\alpha = 5\%$):

Where:

AR_{before} = average abnormal return before event

AR_{after} = average abnormal return after event

σ_{before} = standard deviation of abnormal return before the event

σ_{after} = standard deviation of abnormal return after the event

n = total share sample

g. Calculating the standardized abnormal return for each of the securities by the formula:

where:

SAR = Standardized abnormal stock return at time t

AR_{it} = Abnormal return of stock i in time t

Σ_{it} = standard deviation of stock i

h. Perform test analysis significantly to the value of abnormal return with t-test:

Where:

ΣSAR_{nt} = total standardized

n = total shares sample

Trading Volume Activity**a. Calculating the volume of stock trading activity i in period t :****b. Calculating the average of all stock trading volume activity used as a sample before and after the event:**

And

Where:

TVA before = average trading volume of activity before the event

TVA after = average trading volume of activity after the event

c. Calculating the average standard deviation of returns before and after the event:

and

Where:

TVA before = average trading volume of activity before the event
 TVA after = average trading volume of activity after the event
 σ before = standard deviation of abnormal return before the event
 σ after = standard deviation of abnormal return after the event
 t = time period

d. Calculating the statistical t test (at significant level $\alpha = 0.05\%$):

Where:

TVA before = average trading volume of activity before the event
 TVA after = average trading volume of activity after the event
 σ before = standard deviation of abnormal return before the event
 σ after = standard deviation of abnormal return after the event
 n = total shared sample

Method of analysis

To prove the hypothesis I and II in this study using T-Test with paired samples T-test, different test t-test was used to determine whether two samples are not related to the average values are different by comparing with standard error of the difference in average of two samples. (Nurhaeni, 2009). In accordance with this study is to analyze the difference between the average abnormal return and trading volume activity obtained by investors between before and after the disaster of Japan, the test matches in this research is to use a T-Test.

D. DATA ANALYSIS

1. Abnormal Return

This test begins by calculating the average abnormal return (AAR) for the 45 companies, and then the AAR is divided into two groups, namely ex-ante AAR and ex-post AAR. This data then tested for significance with SPSS program. The test finds that mean and standard deviation for each variable of abnormal return as described in table 4.1.

Table 2: Statistical Descriptive of Variable Abnormal Return

Variable	Condition	Mean	Standard Deviation
Abnormal Return	ex-ante	-0.001091641	0.0124560501
	ex-post	0.001091701	0.0046170901

Source: Data Processed

The table showed an increase in abnormal return of the condition pre and post the disaster Japan, from -0.001091641 became 0.001091701. On the other hand, the standard deviation shows decrease, from 0.0124560501 to 0.0046170901 for the conditions after disaster. The reduced standard deviation shows the homogeneous of abnormal return after the disaster Japan.

2. Trading Volume Activity

This test begins by calculating trading volume activity (TVA) each sampled company. The calculation of TVA is comparing the trading volume and total share. T-test then conducted to the two averages of TVA before and after the event. The test finds that mean and standard deviation for each variable of abnormal return as describe in table 4.2

Table 3: Statistical Descriptive of Trading Volume activity

Variable	Condition	Mean	Standard Deviation
Trading Volume	Before	0.002088153	0.0015486824
	After	0.002158924	0.0014863119

Source: Data Processed

Shows an increase in trading volume activity of the condition pre and post the disaster Japan, from 0.002088153 became 0.002158924. On the other hand, the standard deviation shows decrease, from 0.0015486824 to 0.0014863119 for the conditions after disaster. The reduced standard deviation shows that trading volume activity in capital market almost homogeneous.

3. Hypothesis Testing

Hypothesis 1

Table 4: Paired Sample Test Variables Abnormal Return

		Before-after	
Paired Differences	Mean	- 0.0021836420	
	Std. Deviation	0.0127850937	
	Std. Error Mean	0.0019058892	
	95% confidence Interval Of the difference	Lower	-0.0060247094
		Upper	0.0016574254
t		-1.146	
df		44	
	Sig. (2-tailed)	0.258	

Source: Data processed

Paired sample test above shows the t-value of $|-1.146|$ with (sig) 0.258. Therefore, sig at $0.258 > 0.05$, then the inference drawn is accept the null hypothesis at the level of 95%.

This result is inconsistent with the research from Aktas & Oncu (2006). They explained that the published information or event will influence the abnormal return for investor. However, the result is consistent with the research Danupranata & Wahyono (2003) explaining that event of J.W. Marriot bomb in 2003 did not influence the abnormal return in the Jakarta Stock Exchange.

Hypothesis II

Table 5: Paired Sample Test Variable of Trading Volume activity

		Before-after	
Paired Differences	Mean	-0.0000707709	
	Std. Deviation	0.0010158592	
	Std. Error Mean	0.0001514354	
	95% confidence Interval of the difference	Lower	-0.0003759688
		Upper	0.0002344270
t		-0.467	
df		44	
	Sig. (2-tailed)	0.643	

Source: Data processed

Paired sample test above showed the t-value of $|- 0.467|$ with (sig) of 0.643. Therefore, sig at $0.643 > 0.05$, then the inference drawn is accept the null hypothesis at the level of 95%.

This result is inconsistent with the research from Nurheini (2009) explain that the event of election are influencing the trading volume activity in the Indonesia Stock Exchange. However, the result consistent with the research of J.W. Marriot bomb in 2003 by Danupranata & Wahyono (2003) explain that the event are not influences the trading volume activity in Jakarta Stock Exchange.

4. Explanation

The result of analysis explained that the Japan disaster on Friday March 11th, 2011 did not have significant positive influences to the Abnormal Return and also to the trading volume. If there is a difference in average abnormal return between pre and post the event, it means that the event influencing the investor preferences to take investment decision. The result of this study, however, give the opposite result that the event gave no impact to the preference of investor or it means that the event is not have the content of information for investor.

Theoretically, if there is a shocking information, market will react quickly by the significant change in stock price or in the trading volume. This result explicitly conclude that capital market in Indonesia are not categorized as half-strong efficient market because the stock price does not reflect the available event information e.g. Japan disaster 2011. Possible explanation for this condition is because the event happened in abroad. Investor may prefer to keep calm regardless the condition there.

The result of the trading volume is similar with the abnormal return. There is no fluctuation traded stock in significant number between pre and post event. These condition means that there is no profit taking from investor to response information of the event. Moreover, maybe there are other conditions such as stability in politic, economics, social, etc in home country that may lead investor to keep calm during the Japan disaster 2011.

The other condition that may influences investor not to take profit from this condition, there are sense of believing that Indonesia capital market are strong enough to defend the negative effect of the disaster in

Japan. Moreover, investor believes that Japan no longer will have stable condition after disaster. Even though it is fact that Japan is one of the developed country in Asia, and even in the world, that may influence the other country, investor might assume that the direct influences of Indonesia capital market occurred only in the sector that has close relationship with industry in Japan.

E. CONCLUSION

Based on the statistical test to the average abnormal return of the stock in the event period, there is no significant difference in average abnormal return in the pre and post the event of Japan disaster 2011. It means that the information of Japan disaster 2011 did not influence the stock price in Indonesia Stock Exchange.

T-test of difference in average trading volume activity between before and after the Japan disaster 2011 showed that statistically there is no significant difference before and after the event. It means, investors did not have preference to take profit from this condition and tend to ignore the information.

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