THE IMPACT OF JAPAN TSUNAMI DISASTER ON INDONESIAN STOCK MARKET: AN EVENT STUDY

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ABSTRAK

Studi peristiwa adalah metode riset yang menguji bagaimana suatu peristiwa dapat mempengaruhi nilai suatu perusahaan. Tujuan dari Studi ini adalah untuk menganalisa reaksi pasar saham di Indonesia akibat peristiwa tsunami di Jepang pada tanggal 11 Maret 2011. Sample di penelitian ini adalah 30 perusahaan yang terdaftar di Indonesia stok market khususnya LQ45. Periode estimasi adalah 190 hari perdagangan, dengan periode peristiwa sebanyak 11 hari perdagangan.

Hasil dari studi ini menemukan bahwa selama periode peristiwa tidak ditemukan abnormal return, begitu juga dengan rata-rata abnormal return sebelum dan sesudah peristiwa tidak ditemukan perbedaannya. Pada pengujian aktivitas volume perdagangan yang abnormal juga tidak ditemukan perbedaan sebelum dan sesudah peristiwa.

Kata kunci : *studi peristiwa, pasar saham, tsunami Jepang, return tidak normal, rata-rata return tidak normal, rata rata volume perdagangan.*

1. INTRODUCTION

Event Study is research method that assesses how a particular event affects the value of a firm. According to Binder (1998), some popular paper by Fama (1969) introduced event study as a methodological revolution in accounting and economics as well as finance.

1.1 Study Background

Event study methodology has, in fact, become the standard method of measuring security price reaction to some announcements or events. In practice, event study has been used for two major reasons (Binder, 1998) : (1). To test the null hypothesis that the market efficiently incorporates information; (2). To examine the impact of some events on the wealth of the firm's security holders under the maintained hypothesis of market efficiency, at least with respect to publicly available information.

The reason why this study uses the tsunami in Japan is that Japan is one of the most important economies in the world. The Japanese Nikkei 225 is a broadly cited stock index, and the Japanese Yen is a frequently traded currency in international trades as well as in money markets. If the tsunami in Japan's have any impact on the Japanese financial markets, there is probably contagious effect on other money markets around the world. A study conducted by Achsani (2000) shows how the market responds to the shock from other money markets. According to Achsani, conversely if the shock in Singapore, Australia or Hong Kong, a fast shock will be transmitted to almost all stock markets in Asia Pacific, including the JSE. Research by Yang, Kolari and Min (2002) investigated the stock market integration in Asia around the time of the 1997-1998 Asian financial crises. The research found that the Indonesian market responded to shocks from other markets, such as Japan and US during the crises.

1.2 Research Question

Based on the background, the research questions that are proposed in this study:

1. Were there abnormal returns in Indonesian stock Market during the period of Japan Tsunami disaster?
2. Were there any differences in average abnormal return of stock shares in Indonesian stock Market before and after the event of tsunami in Japan?
3. Were there any differences in the average stock trading volume activities in Indonesian stock Market before and after the tsunami disaster in Japan?

1.3 Research objectives

1. To examine whether the event of the tsunami disaster in Japan contains information reflected by the presence of abnormal return during the events of the tsunami disaster in Japan.
2. To examine the impact of natural disasters of Japan's tsunami in abnormal stock returns, which is reflected by the differences in average abnormal return before and after the tsunami disaster in Japan.
3. To examine the impact of natural disasters of Japan's tsunami to stock trading volume activity, reflected by the differences in the average trading volume activity before and after events of the tsunami disaster in Japan.

2. LITERATURE AND HYPOTHESES

Event study methodology has a long history, as cited in Kinlay (1997) perhaps the first published study is started by Dolley's (1933) stock split study and the level of sophistication of event studies increased from the early 1930s until the late 1960s. Ball and Brown (1968) and Fama et al. (1969) conducted seminal studies in the late 1960s. These introduced the methodology that is essentially the same as that in use today.

2.1 The efficiencies of Stock Market

According Nursiam (2004), an efficient market is a market where securities traded reflects all the information that may occur quickly and accurately.

According to Hagin (1979), in *Modern Portfolio Theory* there are three types of efficient market form: (a).Weak Form, (b). Semi-strong Form, and (c). Strong Form

2.2 Previous Findings in market reaction on non-economic event

Field and Janjigian (1989) and Kalra et al. (1993) examined the effect of Chernobyl nuclear accident on the stock price of public utilities in United States. Both studies found significantly negative reactions to the Chernobyl event. Suryawijaya (1998) examined the impact of political turbulence event "*Peristiwa 27 Juli 1996*" to stock price movement and trading volume in Jakarta stock exchange. This study found that Jakarta stock exchange reacted to that event and it reflected the negative returns during event date.

2.3 Hypotheses

Research conducted by Suryawijaya (1998) about the use of abnormal return, average abnormal return and average trade volume activity to explain the reaction of Indonesia Stock Market during the "27 Juli 1996" event found a significant reaction. The abnormal return are significantly negative during the event date and after three days it rebound to positive. On average trade volume activity there is significant reaction before and after the event. Because past study found a significant reaction, Thus this study about the impact of Japan tsunami event to Indonesia stock market, Researcher propose three alternate hypotheses:

Ha1: There is an abnormal stock return during periods of tsunami disasters in Japan.

Ha2: There is difference in average abnormal return before and after Japan's tsunami.
Ha3: There is the difference in average stock trade volume activity before and after the japan Tsunami disaster

3. RESEARCH METHODOLOGY

This study examines the effect of Japan's Tsunami on March 11, 2011 which crippled and devastated Japan's Economy on the stock returns in Indonesia Stock Exchange.

3.1 Scope of Research

A research requires a scope of discussion so that it would not be out of range. The scopes of this research are as follows: (1). Stock Market examined in this research is Indonesia Stock Market; (2). The sample in this research is 30 companies listed in Indonesia Stock Market especially in LQ45 on March 2011; (3). Secondary data used in this research are daily stock index closing prices of 30 sample companies, and Jakarta Composite Index issued by Yahoo Finance.

3.2 Observation period

In the event study, the observation period is divided into two periods: estimation and event periods.

3.3 Method of Analysis

Analysis models in this research are the models used in the Suryawijaya (1998) research:

a. Formulation model to detect abnormal return

1. In order to calculate actual return of each stock, this equation is used,

$$R_{it} = (P_{i,t} - P_{i,t-1}) / P_{i,t-1}$$

Where: $R_{i,t}$ = actual stock return i in the period t
$P_{i,t}$ = stock price i in the period t
$P_{i,t-1}$ = stock price i in the period t-1

2. In order to calculate market return

$$R_{m,t} = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

3. In order to calculate expected return:

$$E(R_{i,t}) = \alpha_i + \beta_i E(R_{m,t})$$

Where: $E(R_{it})$ = expected return stock i in the period t
R_{ij} = realized return stock i in the period t

4. In order to calculate abnormal return:

$$AR_{I,t} = R_{i,t} - E(R_{i,t})$$

Where : $AR_{i,t}$ = abnormal return stock i in the period of t
$R_{i,t}$ = actual return stock i in the period of t
$E(R_{i,t})$ = expected return stock I in the period t

5. In order to calculate average abnormal return in the period of t :

$$AAR_t = \frac{\sum_{t=1}^{k} AR_{i,t}}{k}$$

Where: k = all stocks which are observed
AAR_t = average abnormal return in period t
$AR_{i,t}$ = abnormal return stock i in the period t

6. In order to calculate Cumulative Average Abnormal Return (CAR):

$$CAAR = \sum_{k=-5}^{t=+5} AARt$$

Where: CAAR = average cumulative abnormal return
AAR_t = average abnormal return in the period t

b. Model Formula to find the difference of abnormal return before and after Japan's tsunami disaster

1. Model for average abnormal return before the event

$$AAR_{before} = \frac{\sum_{t=-5}^{t=-1} AAR_t}{5}$$

2. Model for average abnormal return after the event

$$AAR_{after} = \frac{\sum_{t=+1}^{t=+5} AAR_t}{5}$$

c. Model for Calculate Trade volume Activity before and after Japan's tsunami disaster

1. Trading Volume activity (TVA)

$$TVA_{i,t} = \frac{\sum stock\ i\ that\ trade\ in\ period\ t}{\sum stock\ i\ in\ period\ t}$$

2. Average Trading Volume Activity (AVTA)

$$ATVA_t = \frac{\sum_{t=1}^{k} TVA_{i,t}}{k}$$

Where : $ATVA_t$ = average trade volume activity in the period t
$TVA_{i,t}$ = trade volume activity for stock in the period t
k = all stock sample that affect by the event

3. Average trading volume activity in all stocks, used as a sample before the event

$$ATVA_{before} = \frac{\sum_{t=-5}^{t=-1} ATVA_t}{5}$$

4. Average trading volume activity in all stocks, used as a sample after the event

$$ATVA_{after} = \frac{\sum_{t=+1}^{t=+5} ATVA_t}{5}$$

4. STUDY RESULTS AND DISCUSSION

This study attempts to understand how the stock market reaction in Indonesia towards the events that occurred in the non-economic environment which was tsunami in Japan on March 11, 2011. March 11, 2011 was on a Friday (which was the last day in Indonesia Stock Market to trades company shares), and was the day when devastating tsunami hit Japan east coast. Period estimates for 190 trading days, while the period of the event for 11 trading days consist of 5 days before the event (pre-event), 1 day at the time events (event day), and 5 days after the event (post-event).

4.1 Data analysis

The data used in this study is the stock price data at daily closing (closing price), daily stock trading volume, and the number of outstanding shares of the company is listed in the LQ45 during the period August 2006 until January 2011. Appendix 1 provides a list of 30 companies that are listed in the LQ45 during the period August 2006 until January 2011. The sample taken was 30 companies in terms of total population of companies listed on the Jakarta Stock Exchange. It is sufficient representative of the population with the consideration that the frequent entry of samples into LQ45 means samples are stocks that have the largest a market capitalization in the Jakarta Stock Exchange.

Indonesia stock market reaction to the events of the tsunami disaster is reflected by the abnormal return during the event period, differences in average abnormal return before and after the event, the difference average stock trading volume activity before and after the event tsunami disaster in Japan. The model used to calculate abnormal return is the market model, where the abnormal return is the difference between the actual return with the return expectations for the day. Market model that used in this study are the Indonesia Stock Market Index (Jakarta Composite Index).

4.2 Results of Analysis Testing

4.2.1 Testing Results of Hypothesis I

Before the event, the t_{-5} investor obtain abnormal return is negative but the t_{-3} investors gain positive abnormal return resulting cumulative abnormal return increased. On t_{-2} investor earn a negative abnormal return, but after t_{-1}, past the day of tsunami in Japan and until the end of window period at t_{+5} the cumulative abnormal return are positive and increased. The increase of cumulative abnormal return can be assumed that tsunami in japan had a little concern to the investor that invest in Indonesia, this showed on day t+1 investor get positive abnormal return and though after the Japan tsunami event the cumulative abnormal return keep increasing. At the time before the event there is no abnormal return due to the events of the tsunami disaster in Japan an unexpected event, where the event was not at all expected to before by market participants prior to the event date so that there is no significant abnormal return obtained by investors.

4.2.2 Testing Results of Hypothesis II

Testing hypothesis II in this study is intended to determine the difference in average abnormal return on stocks before and after events of the tsunami disaster in Japan. Based on probability values obtained from these tests can be concluded that average abnormal stock returns prior events was not significantly different from the average abnormal stock returns after the event. It can be recognized by looking at the probability value greater than 0.05. The underlying reason for this is that the investor immediately gave a positive response to the developments in japan because the Japan government quick response to help the tsunami disaster area and there is a lot of country and from abroad quickly provide assistance to deal with natural disasters tsunami in Japan. Based on the results of statistical tests and explanations above, it can be concluded that Ha2 is rejected, because there is no significant difference between the average abnormal return before and after the event.

4.2.3 Testing Results of Hypothesis III

Hypothesis III testing in this study is intended to determine the difference in the average trading volume activity on the Indonesian stock market before and after the tsunami disaster in Japan. Average stock trading volume activity occurring just moving around numbers 0.002 and did not experience a large increase or decrease. The obtained results show that trading volume mean activity 5 days before the event is equal to 0.00198 with standard deviation of 0.00144, while trading volume activity mean five days after the event is equal to 0.001980 with a standard deviation 0.00186, probability of 0.991 and a significance level of 5%. Thus, based on probability values obtained from these tests can be concluded that average stock trading volume activity was not significantly different with the average stock trading volume activity after the event. it is can be determined by looking at the probability value greater than 0.05. Based on the results of statistical tests and explanations above, it can be concluded that Ha3 is rejected, because there is no significant difference between the average trading volume activity before and after the event

V. CONCLUSIONS AND RECOMMENDATIONS

This study attempts to understand how the stock market reaction in Indonesia towards the events that occurred in the non-economic environment which was tsunami in Japan on March 11, 2011, thus after conducting a series of tests on all hypotheses the conclusions are obtained as follows :

1. In the event of the tsunami disaster in Japan according to hypothesis I, there was no abnormal stock returns during the period of the event, it is mean Investor that trade in Indonesia Stock Exchange did not get any abnormal return during the period of the event.
2. In the event of the tsunami disaster in Japan, there was no difference to the average abnormal stock returns before and after the period events. These mean no significant reaction in Indonesia Stock Market before and after the event of Japan tsunami.
3. In the event of the tsunami disaster in Japan, there is no difference to the average stock trading volume activity before and after events. These mean no significant reaction in trading volume of stock that traded in the Indonesia Stock Market, before and after the Japan Tsunami.

According to the results of this research indicate that there is no significant average abnormal return reaction before and after the Japan tsunami event. It mean Investor do not change their stock trade strategy because the Japan tsunami event. Japan Tsunami considered as a natural disaster, and the tsunami struck the area away from the Jakarta Stock Exchange although after the tsunami many major factories in japan are closed. Investor already know that although the factory in Japan are closed, the fast response by the Japan government to help the area that get the disaster give relief and fasten the japan recovery. Another reason because many japan industrial already moved their production to China and ensures the supply to Indonesia. The conclusion is that the investors consider that the impact of Japan Tsunami will not influence Indonesia economic significantly

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