3.1 Introduction

The objective of this chapter is to explain the methodology of the research that is used in this study. In order to set the stage for the methodology, there is need to restate the objectives of the research as outlined in chapter 1. The objective of the research is to investigate the impact of domestic political events on stock market. Specifically the objective is to examine:-

whether the domestic political events generate abnormal returns to security holders; and

whether the average abnormal returns before and after the events are different significantly.

Semi-strong form of Efficient Market Hypothesis is used as the theoretical framework in this study. If the market is efficient, then the stock prices will fully reflect all the information that is publicly available.

In this study, two variables are employed, namely: domestic political events as independent variables and abnormal returns as dependent variables.

Figure 3.1: Theoretical Framework
3.2 Events Identification

The source of information on the occurrence of the domestic political events used in this study will be the headlines appearing in the "Kompas" newspaper, the leading newspaper in Indonesia. The headline will be defined as the stories appearing on the front page of the newspaper. This newspaper is selected because it is one of the most trusted and influential newspapers and has the widest coverage of circulation in the country.

Many events cannot be classified exactly as to time and duration of occurrence. In order to revise the dating on these occasions, subjective considerations would have to be made. For those political events that are accompanied by a large price change, however, there is evidence that an event has occurred and did have an effect on a particular day. If the event occurred two hours before the close of the market, then the next day was considered as day zero. Similarly, if the event occurred on Saturday or Sunday, or on any public holiday, then the next trading day would be assumed as an event day. For example, President Wahid removed two economic ministers, Laksamana Sukardi and Jusuf Kalla on Monday, April 24th, 2000, at 18.30PM. Therefore, the next day, April 25th, 2000, was considered as the event day. Similarly, a bomb exploded on a Sunday, May 28th, 2000, at one of the churches in Medan and injured 23 people. In this case, Monday was then considered as the event day. Some events occurred on public holidays or at a time when the stock market had closed. For examples, the explosion in the Attorney General's office, and the announcement of a new cabinet when Vice-president Megawaty was not present, occurred on public holidays. For these cases, a similar treatment as the above-mentioned cases is performed.

In this study, political events are excluded from the analysis if the occurrences of two or more events are closed to each other, that is, if another event occurs in the event period of one event. This omission is performed to avoid the noise effect. For example, the presidential election was held on 20th-21st October 1999 and the announcement of the new cabinet (another event) occurred on the third trading day after the election. Therefore, these events were not included in the study. Similarly,
the events of the explosion in Jakarta Stock Exchange, a loan released by IMF and
the Police Chief's removal were excluded because they were close to each other
and, therefore difficult to treat them as separate events. The explosion in Jakarta
Stock Exchange occurred on September 13th and the next day, September 14th, IMF
released a U.S$ 399 million loan to Indonesia. Furthermore, on September 18th,
2000 President Wahid sacked the Police Chief Rusdiharjo.

One political event was also excluded from the study because there was no trading
for some days after the event occurred. On December 24th, 2000, a series of
Christmas Eve church bombings occurred in few regions including Jakarta, Medan,
Bandung, Mojokerto and Sukabumi in Java, Batam, and Mataram in Lombok. In the
incident, at least 16 people were reported killed. The market indices are not

After having gone through all the screening process, finally there are 11 domestic
political events identified as follows:

1. November 26th, 1999

Hamzah Haz, the head of Partai Persatuan Pembangunan (PPP party)
resigned from the cabinet.

2. December 22nd, 1999

A clash broke out between Christians and Muslims in Maluku. It led to over
100 deaths and many Christian fled to Ambon.

3. February 14th, 2000

President Abdurrahman Wahid removed General Wiranto, Minister of
Defense, from the cabinet.

4. April 24th, 2000

President Abdurrahman Wahid dismissed two economic ministers,
Laksamana Sukardi and Jusuf Kalla, from the cabinet. Many Golkar and PDI-
P representatives in the assembly were unhappy.
5. May 28th, 2000

Church bombing in Medan injured 23 people.

6. June 20th, 2000

A fresh violence, which led to the death of 114 people, broke out in Halmahera, Maluku.

7. July 4th, 2000

A bomb exploded in the building that house the Attorney General’s office in Jakarta.

8. August 1st, 2000

President Wahid, Megawaty Sukarnoputri, Amien Rais, and Akbar Tandjung met at the Kraton Yogyakarta on the invitation of Sultan Hamengkubuwono X. After private discussion, they issued a public agreement that conflicts among the leadership were not good for the country as a whole.

9. August 23rd, 2000

President Abdurrahman Wahid announced the new cabinet when Megawaty was not present.

10. October 26th, 2000

Riots broke out in Pontianak, Kalimantan and caused the death of at least 3 people.

11. February 18th, 2001

A clash between Dayaks and Madurese settlers broke out in Sampit, central Kalimantan, and on the same day, riots broke out in Selat Panjang, Riau where one police station and several Chinese-owned shops were burned.

3.3 Data

Daily returns data was primarily obtained from Jakarta Stock Exchange website: www.jsx.co.id on May 2nd, 2001. The sample data used in this study are the daily
sectoral indexes, namely agriculture, mining, basic industry, consumer, property, infrastructure, finance, trade, manufacturing, LQ45, and miscellaneous industries. The all sectoral indexes covered is for the period of May 1999 to February 2001. Domestic political news was obtained from Indonesia's leading newspaper, Harian "Kompas".

3.4 Hypotheses

There are two hypotheses used in this study:

1. \( H_0: \) Domestic political event produces zero abnormal returns.
   \( H_a: \) Domestic political event produces significant abnormal returns.

2. \( H_0: \) Average abnormal returns post event are not different significantly from those of pre event.
   \( H_a: \) Average abnormal returns before and after the event are different significantly.

3.5 Methodology

Event methodology is employed in this study to analyze the response of the stock market to domestic political events. The proper length of the event window is an empirical issue. Too long a window allows other news and events to offset the ones that are of interest to this study, while too short a window means that the effect of the event may not be fully observed. The nature of politics in Indonesia changes very rapidly and most of the information are possibly absorbed in a short period of time, the estimation period that is used in this study, therefore, is 100 trading days prior to the event period, i.e. 6 days to 105 days before the event day, while the event period is 11 days. The estimation period is the time period to determine the expected returns of sectoral indexes. An event period is a time period used in the calculation of abnormal returns.
The time line for this study employing 100 days of estimation period and 11 days of event period may be described as follows:

\[
\begin{array}{c|c|c|c}
\text{estimation period} & \text{event period} \\
\hline
\hat{t}_b & t_{pre} & t_e & t_{post} \\
-105 & -5 & 0 & 5 \\
\end{array}
\]

where,

\[\hat{t}_b\] = The first period used in the estimation of a normal security return;

\[t_{pre}\] = The first period used in the calculation of abnormal returns;

\[t_e\] = The event day; and

\[t_{post}\] = The last period used in the calculation of abnormal returns.

The \[t_{pre}\] and \[t_{post}\] are selected so that any wealth effect upon the security is expected to occur within that period.

In this study, mean-adjusted returns model is employed to estimate normal or expected returns. Mean-adjusted returns are even period returns minus a constant, the constant being the average return for that industry during its estimation period. Mean-adjusted return is employed because it is seen as the most appropriate than the other models such as market models and market-adjusted model, when an event seems to affect the stock market as a whole. Market models employ an ordinary least square to estimate the expected return of an industry by regressing the industrial index against the market index. If, for example, an event is expected to affect the whole share prices to move together, then a higher expected return is expected to be obtained. Since the actual return is also expected to increase, the excess return (obtained from subtracting the actual return from the expected return) will be expected to be low. Thus, a significant abnormal return is difficult to observe. Similarly, by employing the market-adjusted returns, an excess return is obtained by subtracting the market return for the period from the return on the industry for the same period. They involve no estimation process and no estimation period. An
event that causes both indexes to move in the same direction will result in low abnormal returns.

Since political events do not affect certain share prices or certain industrial indexes, the mean-adjusted return model is better employed than the market model and the market-adjusted model.

The mean-adjusted return model assumes that the expected return of industry \( i \) is a constant, \( R_{i}^{*} \). For example,

\[
R_{i}^{*} = (1/T) \sum_{j=1}^{T} R_{ij}
\]

where

\( T \) = number of days in the estimation period.

The excess return (also referred to as the abnormal return or the prediction error) for a sectoral index for a given period is the difference between the observed or actual return for that period and the expected or predicted return for the same period:

\[
AR_{it} = R_{it} - R_{i}^{*}
\]

where

\( AR_{it} \) = Abnormal sectoral index return or prediction error for sector \( i \) in day \( t \) in the event period;

\( R_{it} \) = Return on sector \( i \) in day \( t \) in the event period; and

\( R_{i}^{*} \) = Mean return of industry \( i \) over the \( T \) periods within the estimation period.

Standard deviation of the daily industrial returns during the estimation period from \( t - 105 \) through \( t - 6 \) is calculated as follows:

\[
\sigma_{i} = \sqrt{\frac{\sum_{j=105}^{t-6} (R_{ij} - R_{i}^{*})^2}{T - 1}}
\]

where

\( \sigma_{i} \) = Standard deviation of returns of industry \( i \) in the estimation period.
Each industry’s abnormal return for a given day in the event period can be tested by using the following equation:

\[
\text{t-statistic} = \frac{AR_i}{\sigma_i}
\]

The cross-industrial analysis can be performed with the following procedures. Firstly, aggregate the abnormal returns and standard deviations across the industries in the event period; that is, sum the abnormal return of each industry or sector for each day in the event period and divide by the number of industries in the sample, as shown below:

\[
AR_i^* = \frac{\sum_{i=1}^{N} AR_i}{N}
\]

Where

\[N\quad = \text{the number of industries or sectors in Jakarta Stock Exchange.}\]

There are 12 market indices in the Jakarta Stock Exchange. 10 out of 12 indices are the industrial indices, and the other two are the composite index and the liquid 45 index. In calculating the cross-industrial abnormal returns, the latter two are omitted. Thus, \(N\) is equal to 10.

The cross-industrial variances are the summation of the variance of all industries’ returns estimated during the estimation period and divide by the number of industries in the market. The square root of this sum is the cross-industrial standard deviation. The calculation of the standard deviation can be performed as follows:

\[
\sigma_N = \sqrt{\frac{\sum_{i=1}^{N} \sigma_i^2}{N}}
\]

Secondly, the test of cross-industrial abnormal returns is performed to determine if there are significant abnormal returns across industries in the event period.

\[
\text{t-statistic} = \frac{AR_i^*}{\sigma_N}
\]
If the t-statistic is significant on the day of the event but insignificant on the days following the event, a reasonable conclusion can be drawn that the event affects the industrial returns but that it does not contradict the efficient market hypothesis. In contrast, if the t-statistic continues to be significant on the days following the event day, a conclusion that the market is not efficient will be made. If the significant t-statistic is observed before the event occurs, the event might be anticipated.

In order to test the second hypothesis, first, we need to calculate average abnormal return before and after the event, that is, the averages of 5-day abnormal returns before and after the event.

\[
AR^*_{\text{before}} = \frac{\sum_{t=-5}^{t=n-1} AR_{\text{before},t}}{n}
\]

where

\[AR^*_{\text{before}} = \text{average abnormal return before the event day.}\]

and

\[
AR^*_{\text{after}} = \frac{\sum_{t=1}^{t=5} AR_{\text{after},t}}{n}
\]

where

\[AR^*_{\text{after}} = \text{average abnormal return after the event day.}\]

Secondly, we calculate standard deviation of average abnormal return before and after the event:

\[
\sigma_i,\text{before} = \sqrt{\frac{\sum_{t=-5}^{t=n-1} (AR_{\text{before},t} - AR^*_{\text{before},t})^2}{n-1}}
\]

and

\[
\sigma_i,\text{after} = \sqrt{\frac{\sum_{t=1}^{t=5} (AR_{\text{after},t} - AR^*_{\text{after},t})^2}{n-1}}
\]
In order to test the difference of means, a pooled standard error of the difference between means of the samples must be calculated first. The formula to calculate the combined standard error of difference between means is as follows:

$$
\sigma_{\text{pre-post}} = \sqrt{\left(\frac{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}
$$

where

$$\sigma_1^2 = \text{the variance of pre-event period};$$

$$\sigma_2^2 = \text{the variance of post-event period};$$

$$n_1, n_2 = \text{number of days pre and post-event periods}.$$  

The statistical t-test is used to observe whether there is a difference between the means of each industrial abnormal returns pre and post-event period. In this study, it is the difference between means of the five days industrial abnormal returns before and after an event. To calculate t, the following formula is used:

$$t = \frac{AR_{\text{after}}^* - AR_{\text{before}}^*}{\sigma_{\text{pre-post}}}$$

However, the statistical t-test across all the industries is different from the above-mentioned formula. The t-test to examine the means of the abnormal returns across industries can be performed using the following equation:

$$t = \frac{AR_{N, \text{after}}^* - AR_{N, \text{before}}^*}{\sqrt{\frac{\sigma_{N, \text{after}}^2}{N} + \frac{\sigma_{N, \text{before}}^2}{N}}}$$

If the t-statistic is significant, we might conclude that the market is inefficient because it does not quickly absorb new information. However, this conclusion can only be drawn if an event affects industrial returns. Moreover, an insignificant t-statistic does not necessarily mean that it supports an efficient market hypothesis. Two possibilities might cause that the t-statistic not to be significant. The first possibility is that the event does not affect industrial returns and therefore we cannot
conclude that the market is neither efficient nor inefficient. The second possibility is when the industries or the market immediately react to the release of information, and therefore the market is efficient.