SEMI-STRONG EFFICIENCY TEST OF INDONESIAN SECURITY PRICES IN THE CONTEXT OF STOCK SPLIT ANNOUNCEMENT IN PERIOD 2006-2016

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ABSTRACT

The aim of this research is to investigate the semi-strong form of market efficiency of Indonesian capital market in the context of stock split announcement. This research use 123 companies who conduct stock split during 2006 – 2016 as the sample. In order to prove the market efficiency, this study use abnormal return and nonparametric test. Market model was used to find the abnormal return, while normality test and Wilcoxon Signed Rank Test were used to analyze the data.

The result showed that all companies who conduct stock split during 2006 – 2016 do not have abnormal return, and almost all companies in Indonesia has no significant differences in stock return during stock split announcement event. The empirical result showed that Indonesian capital market follows semi-strong form of market efficiency.

Keywords: Abnormal Return, Stock Split Announcement, Semi-Strong Market Efficiency, Shapiro-Wilk Test, Wilcoxon Test

Research Background

Capital market is a place where companies and investors do monetary transaction. Companies assume capital market as a place to earn money to pay its operational cost by selling some shares while investors assume capital market as a place to invest their money through buying several securities which can give them good return. In capital market, securities prices are affected by information available about the companies. The information include company's current financial performance and future events that will happen in the company. These information are important for investors when analyzing shares to predict return value in the future.

Corporate action is one of many types of information available for investors. One example of corporate action is stock split. Stock split is the event where companies divide one particular stock into several stocks with smaller value. Usually, companies conduct stock split when the price of their stock is too high so investors will not interested to buy those securities since it is too expensive. After companies have conducted stock split, the value of one stock become smaller and the proportion of available stocks for investors will increase, so stock split will attract new investors to invest in that company. Besides that, investors who already have securities of that company will own more proportion of stocks.

In research by Dwimulyani, Susi. (2008), it is listed that stock split will not result in changes to the value of company (the amount of capital and cash flow), so theoretically, stock split event do not have economic value. Although the theory said that stock split has no economic value, there are many companies who do stock split in the capital market. This shows that stock split is an important tool in the practice of capital markets.

Recently, Indonesian capital market is in a condition known as bullish market, which means the capital market is facing uptrend. Bullish is a condition where the value of domestic currency becomes stronger toward foreign currency. This bullish condition is affected by economic condition in Indonesia, where the government is quite strict in managing the country's financial condition so the value of Rupiah can be stronger.

As the impact of this bullish market, the value of securities owned by firms listed in IDX increased. In IDX itself, there are some companies who have good reputation due to their financial performance and liquidity. As investors are interested to invest in those companies, their stock prices can increase up to thousand rupiah so they need to conduct stock split to cut securities price and keep their liquidity. Before stock split event is being held, companies will give an announcement to public and investors that there will be stock split in the future so public and investors can expect to that new information.

Since companies announce the upcoming event to public, there is a chance for investors to find special information from inside the company which can make them get abnormal return. In another side, there is also a chance that the information about upcoming event will affect securities prices immediately before investors are able to get abnormal return, which also known as efficient market. These potential possibilities make researcher want to analyze stock price movement of several companies listed in Indonesian Capital Market which conduct stock split during

2006-2016, whether there is abnormal return during stock split event and whether specific information about upcoming event affects Indonesian securities prices immediately.

Problem Statement

The problem of the research is the performance of Indonesian securities prices in the context of stock split. This study focuses to analyze the abnormal return and testing whether Indonesian capital market follows semi-strong market efficiency. The problem statement of this research will be as follows:

a) Is there abnormal return in Indonesian securities prices in the context of stock split announcement?
b) Does Indonesian capital market follows semi-strong form of market efficiency?

Research Objective

Based on the problem statement above, the research objectives of this study are listed as

a) To examine whether there is abnormal return on Indonesian securities prices as impact of stock split announcement.
b) To test whether Indonesian capital market follows semi-strong form of market efficiency.

LITERATURE REVIEW

Capital Market

Capital market or stock market is the place where supplier of funds (public) and user of funds (corporation) do transaction. In capital market transaction, companies will get equity funds from public as a source of financing, in addition to debt financing or retained earnings financing while public will get a specific proportion of ownership rights which is known as shares after investing some money, also payment from companies namely dividend.

Any movement of a corporate stock is reported in the capital market. Public can access the information through capital market's websites and other forms of media (i.e. television, radio, etc.). Stock market is often used as predictors of economic activity and performance, so it is important to tell any movement of companies or capital market to public as soon as the event is planned. The announcement of particular event usually affects stock prices. If stock prices adjust immediately after a particular event announcement, then the market can be said as efficient.

Market Efficiency

According to Fama (1970), a market can be defined as efficient when current stock price fully reflects available information about the company. Fama argued

that a capital market will be efficient if nobody, include intelligent investors and insiders, cannot get return higher than average market return (also known as abnormal return), even after considering the risk and strategy used to gain profit.

Fama (1970) classifies three forms of capital market efficiency based on the type of information as follows:

a. Weak-form efficiency, where securities prices fully reflect all historical information.
b. Semi-strong form efficiency, where securities prices reflect all publicly available information.
c. Strong-form efficiency, where securities prices reflect all relevant information both public and private information.

Fama (1970) defines several market conditions that can help or hinder price adjustment after new information has released. These conditions should be fulfilled before a market can be called as efficient. The conditions are as follows:

a. Investors can interpret information well because securities price are affected by the demand and supply made by investors, and one investor cannot affect securities price by himself
b. All available information is free for all market participants at the same time
c. Information is released randomly so investors would not know when there will be new information from companies
d. Investors react quickly and fully to new information released so it will reflects on securities prices immediately.

When financial markets are in semi-strong form efficiency, there are some implications for the company and investors such as:

a. Publicly available information is not helpful in forecasting future prices.
b. Without private information, the best way to forecast future prices is by using current price.
c. Without private information, firms cannot set the optimal price to sell securities because all information is available in the market. Firms should expect to receive fair value for securities that they sell. Fair means the price they receive from issuing securities is the present value. Thus firms cannot receive profits from fooling investors in efficient market.

Active vs. Passive Portfolio Management

Active management is the attempt to improve investing performance either by identifying mispriced securities or by timing the performance of broad asset classes, i.e. increasing the commitment to invest in one stock when it is bullish on the capital market (Bodie, Zvi et al., 2011) while passive management is the attempt to hold portfolios or improve investing performance without any efforts or other resources, so it is only through security analysis. Passive management strategy focuses only at establishing a well-diversified portfolio of securities and it is characterized by buy-and-hold strategy (Bodie, Zvi et al., 2011). Since efficient market assumes that information reflects on securities prices, supporters of EMH believes that it is unnecessary for investors to have an active management strategy, since active management strategy wastes efforts and has high cost.

Information Asymmetry

Stiglitz (2002: 469) as cited in Connelly, B. L. et al., (2011) explains that information asymmetry happens when two parties have different proportion of information. In corporate events, not all investors have same proportion of information. Since some information are private and only few parties who know that information, party who holds private information have more advantages than another party who does not have private information.

Signaling Theory

Spence (2002) states signaling theory is associated with reducing information asymmetry between two parties (Connelly, B. L. et al., 2011). Firms need to send signal to investors when they will conduct an event to gain information whether outsiders interested with their following event, while investors need to get signal from firms in order to make better investment decision. In the context of stock split, investors see stock split announcement as signal of increasing dividend since companies who do stock split are companies who have good financial performance. Unfortunately, not all stock split event announcement can have the good response from market. Companies who are liquid will receive the positive response from market as feedback for their signals while companies who are not liquid may receive the negative response. Market and investors see companies who are not liquid or have less trading volume activity as not having good prospect in the future so they will not interested to invest in those companies.

Event Study

In the research by Bodie, Zvi et al., (2011), it is listed that event study is a technique of empirical financial research that enables an observer to assess the impact of a particular event on a firm's stock price. In other side, Jogiyanto (2003) said that event study learns market reaction to an event whose information is announced to public as an announcement. General approach of event study is to analyze information content of an announcement and market reaction when there is particular event. Market reaction is shown by the changes in securities price and it can be measured using abnormal return. When there is abnormal return after an announcement released to public, then it can be said that announcement has information content. In opposite, if there is no abnormal return after an announcement released to public, then it can be said that announcement has no information content.
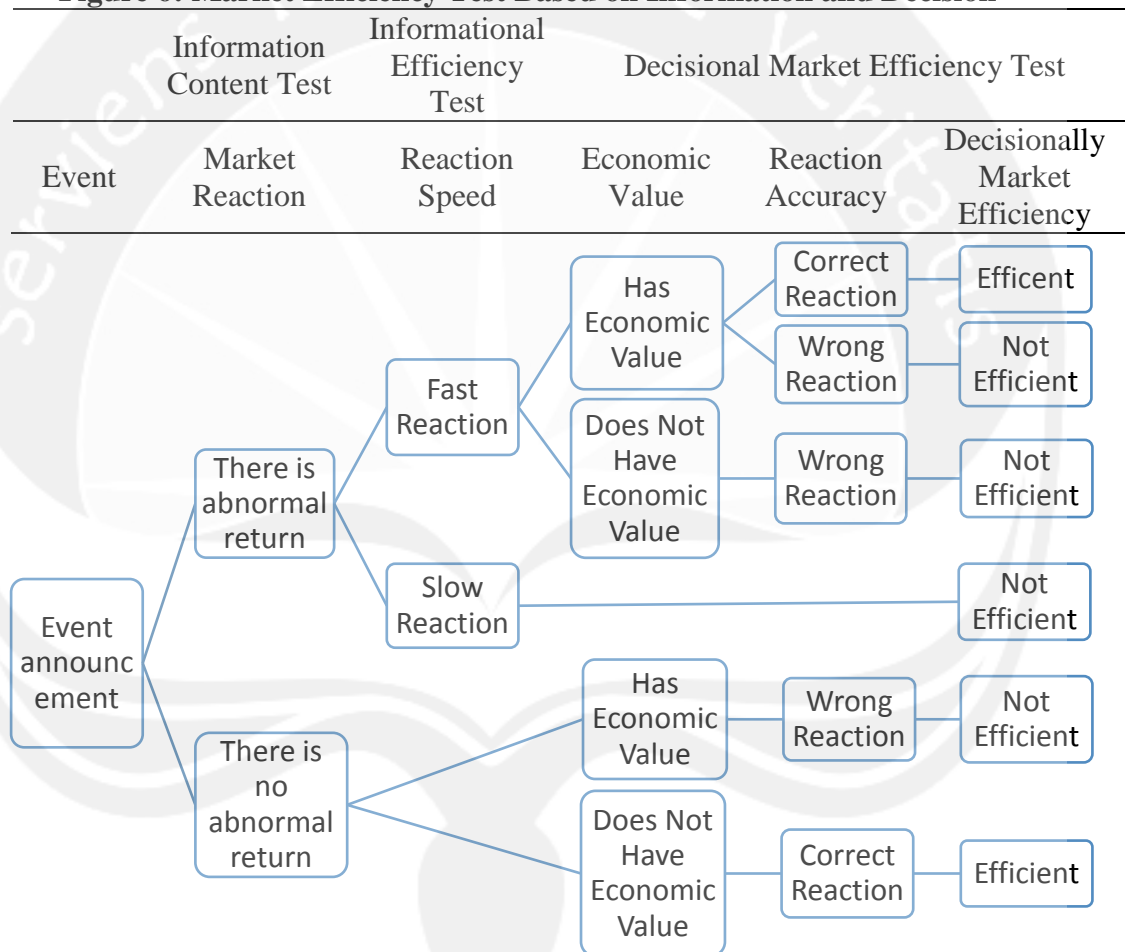
Figure 5: Information or Content of an Announcement

Event	Market Reaction	Result
event announcement	there is abnormal return	there is information in announcement
	there is no abnormal return	there is no information in announcement
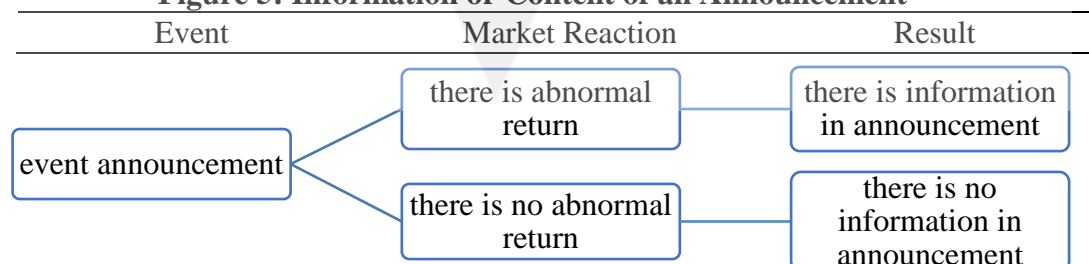
Source: Figure 14.2, Jogiyanto. (2003) pg. 411

A market is efficient if investors react quickly to absorb information to have equilibrium price. If investors absorb information slowly, then market is not efficient in semi-strong form based on information available. Market efficiency test can be measured from information available and decision made by market participants. Market efficiency test which based on information only does not give attention to the sophistical of market participant, while market efficiency test based on decision can differentiate information which has economic value and has no economic value. Furthermore, they will analyze further information received so they cannot be fooled by companies.

Figure 6: Market Efficiency Test Based on Information and Decision

Event	Information Content Test	Informational Efficiency Test	Decisional Market Efficiency Test		
	Market Reaction	Reaction Speed	Economic Value	Reaction Accuracy	Decisionally Market Efficiency

Source: Figure 14.4, Jogiyanto. (2003), pp. 414

Hypothesis Development

Stock split is an event which gives advantages for both investors and companies, since stock split can increase company's liquidity, attract new investors to invest in the company, also increase the stock proportion owned by recent investors. However, some investors will try to obtain additional return from market (also known as abnormal return) after new information about upcoming stock split

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event released in order to get additional profits. Because of that, researcher develops a hypothesis as follows:

1. There is abnormal return in stock during stock split announcement event.

The theory above explains that there are three forms of market efficiency and efficient market has different reaction compared to inefficient market when new information is released. Commonly, the target of new information is public and that new information can affect securities prices in capital market immediately, which is known as semi-strong form of market efficiency. Based on the theory, researcher develops hypothesis as follows:

2. Indonesia Stock Exchange follows semi-strong form of market efficiency.

RESEARCH METHODOLOGY

Population of this study consists of companies listed in Indonesia Stock Exchange (IDX) which conduct stock split in period 2006-2016. There are 123 companies as the sample and the period of analysis is 201 days before and after stock split announcement. Types of data that will be used in this study are secondary data. This study uses daily close price of firms listed in IDX which conduct stock split during 2006 to 2016, and daily close price of market index return data. There are some criteria for selecting the sample, such as:

1. Capital market (IDX) and KSEI should have certain information about the date of stock split announcement held by companies.
2. Assume that there is no other corporate actions or events happen in the companies during observation period.

The length of time for event study determined as $t = -100$ to $t = +100$ with event date determined as $t = 0$. The estimation window has listed as $t_0 = -100$ to $t_1 = -11$, while the post event window has listed as $t_2 = +11$ to $t_3 = +100$. In another side, event window listed as $t = -10$ up to $t = +10$.

Method of Analysis

As stated in Jogiyanto's book (2003: 111), the formula of real return defined as follows:

$$R_{it} = \frac{Pi_t - Pi_{t-1}}{Pi_{t-1}}$$

where Pi_t is the price of stock i in current day, Pi_{t-1} is the price of stock i in the day before or yesterday.

To calculate the real market return, it requires the price of market index of current day subtracted by price of market index in the day before divided by price of market index the day before. The formula defined as follows:

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

where R_{mt} is the market return of market portfolio on day t, IHSG (Index Harga Saham Gabungan) is the market index of Indonesian Stock Exchange.

In his study, Chakraborty, Prithul (2011) stated the expected return of stock i for day t, $E(R_{it})$ calculated by putting the value of R_{mt} also respective OLS estimation of α_i and β_i into following equation:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt}$$

where R_{mt} is the market return of market portfolio on day t, α_i is the intercept term, and β_i is the systematic risk of the i stock, ε_{it} is the residual of market model with zero mean and constant variance.

To calculate abnormal return, Chakraborty, Prithul (2011) defines abnormal return (AR_{it}) is the difference between actual return (R_{it}) and the expected return $E(R_{it})$. The equation defined as

$$AR_{it} = R_{it} - E(R_{it})$$

Shapiro-Wilk Test

Saphiro-Wilk method for normality test developed by Samuel Saphiro and Martin Wilk in 1965. This method is chosen because the amount of data is less than thirty. Adopted Saphiro, S.S. and Wilk, M.B. (1965), the formula of Saphiro-Wilk defined as:

$$W = \frac{\left(\sum_{i=1}^{n} a_i y_i\right)^2}{\sum_{i=1}^{n} (y_i - \bar{y})^2}$$

where a_i is the coefficient of Saphiro-Wilk test, $\bar{y}$ is the sample mean, y_i is i^{th} smallest value of sample y, with the value of $y_1 < y_2 < \ldots < y_n$, and n is the sample size.

Parametric Test (Paired Sample T-Test)

Paired sample t-test used when the difference scores are random and independent, also the data comes from a population that is normally distributed. The aim of paired sample t-test is to determine whether there is a significant difference in a population based on mean. Paired sample t-test usually follows student's t distribution with n-1 degrees of freedom. Adopted from Doane, D.P. and Seward L.E., (2016: 401), the formula of paired sample t-test listed as follows:

$$T_{STAT} = \frac{\bar{D} - \mu D}{\frac{SD}{\sqrt{n}}}$$

where $\bar{D}$ is the mean of n differences, μD is the hypothesized difference (usually $\mu D = 0$), SD is the standard deviation of differences, n is the amount of sample data.

Mean of difference is found using the following formula:

$$\overline{D} = \frac{\sum_{i=1}^{n} Di}{n}$$

where Di is the difference between sample one and sample 2 (difference between X_1 and X_2)

Standard deviation of n differences can be found using the following formula:

$$SD = \sqrt{\frac{\sum_{i=1}^{n}(D_i - \overline{D})^2}{n-1}}$$

Non-Parametric Test (Wilcoxon Signed Rank Test)
    Wilcoxon signed rank test developed by Frank Wilcoxon (1892 – 1965), and the aim of this method is to compare a single sample using ranks of data (Doane, D.P. and Seward L.E., 2016: 693). Wilcoxon signed rank test as nonparametric test has some advantages compared to parametric test since this method is free from normality assumption, it's applicable to ordinal data, and due to its robustness to outliers (Doane, D.P. and Seward L.E., 2016: 693).

    To calculate the difference between each observation and hypothesized median, we need to rank each data from the smallest to largest by absolute value, then add the ranks of positive differences to get the Wilcoxon signed rank test statistic W (Doane, D.P. and Seward L.E., 2016: 693). Adopted from the book by Doane, D.P. and Seward L.E., (2016: 693), the formula of Wilcoxon signed rank test statistic W is defined as:

$$W = \sum_{i=1}^{n} R^+$$

where W is the sum of all positive ranks, R^+ is the positive ranks, n is the amount of sample.

Expected value of W statistics defined as:

$$\mu_w = \frac{n(n+1)}{4}$$

Standard deviation of W statistic defined as:

$$\sigma_w = \sqrt{\frac{n(n+1)(2n+1)}{24}}$$

    After W statistic, expected value of W statistic, and standard deviation of W statistic are found, we can carry out those values to Wilcoxon test statistic to find the significance difference using this formula:

$$Z_{calc} = \frac{W - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}} \quad or$$

$$Z_{calc} = \frac{W - \mu_w}{\sigma_w}$$

Consideration of Parametric or Non-Parametric Test

Both parametric and nonparametric test used to find any differences in data which is related or paired. These tests are commonly used to investigate the differences of data before and after an event occurred. It is already stated above that the decision of using parametric or nonparametric test is based on the normality test to see the distribution pattern, and parametric test is based on mean while nonparametric test is based on median.

The hypothesis of parametric test defined as:

$$H_0: \mu_d = 0$$

$$H_a: \mu_d \neq 0$$

while the hypothesis of nonparametric test defined as:

$$H_0: M_d = 0$$

$$H_a: M_d \neq 0$$

where H_0 means that there is no significant difference before and after an event and H_a means that there is significant difference before and after an event.

DATA ANALYSIS AND DISCUSSION

Result of descriptive statistics show that all companies have negative abnormal return during stock split announcement event. Negative abnormal return means there is no insider trading or leaked information from insiders to investors before public announcement. There is a possibility that investors and market are not enthusiast to stock split announcement held by companies since they think there is no information content in the announcement. Besides that, they may see a not good prospect in those companies so they decide to give negative response to company shown by negative abnormal return. This assumption is in line with the theory of Jogiyanto (2003: 411) in Figure 5 that shows if there is no abnormal return, it means there is no information content in the announcement. As we can see on Figure 6, it shows that if there is no abnormal return and the announcement has no economic value, then market is said as giving correct reaction so capital market is efficient. Since empirical result shows that market are not reacted to the announcement which shown by negative abnormal return, then Indonesian capital market can be said as efficient.

The result of normality test shows that all companies are not normally distributed with significance value less than alpha (0.05). It also shows that from 123 companies, Citra Tubindo Tbk is omitted from the test due to constant daily return. Since the pattern is not normally distributed, then nonparametric test is choosen. According to Wilcoxon signed rank test result, almost all companies have no significant differences in stock return before and after stock split announcement. From 122 companies, there are only five companies who have significant differences in stock return before and after stock split announcement event, they are Jaya Real Property Tbk in 2006; Mitra International Resources Tbk and Timah (Persero) Tbk in 2008; Berlina Tbk in 2012; and Kresna Graha Sekurindo Tbk in 2016.

During stock split event, market expects to receive high dividends from company after stock split announcement and or after effective date. However, stock split event may cause increasing dividend or decreasing dividend, so the impact of stock split event is anomalous. Litner (1956) cited in Fama et al., (1969) said when a company is going to have stock split, it will send an announcement to public as a signal if company's directors are confident that their future earnings are enough to give investors more dividend. If market accepts the signal, then market expects company will earn high earning in the future so they will earn more dividends. This will cause large stock prices increasing and there will be significant differences in shares.

Study of Fama et al., (1969) said that stocks which experienced increasing dividend after stock split event will resume their normal relationships to market return after a moment, while stocks which experienced decreasing dividend after stock split event will resume their normal relationships to market return immediately because the anticipated dividend increase is not coming, so the effect of stock split seems to be completely wiped away.

Since empirical result shows there is no abnormal return and no significant differences in stock return, it means stock prices adjusted immediately after announcement and stock split event does not lead to increasing dividend received by investors. Here, we can say that stock return is not affected by stock split announcement as public information so Indonesian capital market can be said as semi-strong efficient.

CONCLUSION

The conclusion of this research study are originated from the hypothesis testing to answer the problem statement. Those conclusions are defined as follows:
1. The hypothesis which investigates whether there is abnormal return in stocks prices during stock split announcement event is **not supported.**
2. The hypothesis which states that Indonesia Stock Exchange follows semi-strong form of market efficiency is **supported.**

LIMITATION AND SUGGESTION

In this study, researcher only use one corporate event which is already common used in research study and for the criteria of sample, and researcher uses assumption that there is no other corporate events in companies during observation period while in reality there may be other corporate events happen in companies during observation period. Furthermore, this study has a limitation for using data of announcement date which derive from KSEI and not the date from general meeting of shareholders (RUPS). The actual announcement date of stock split as corporate event derives from the general meeting of shareholders when more than half shareholders agree to conduct stock split in the future. The announcement made by KSEI seems like a reminder to their account holders because it is only few days before cum date. Since researcher uses the announcement date from KSEI, it means that researcher uses reminder date instead of actual announcement date although KSEI has the real data from general meeting of shareholders. Besides that, there is a possibility that several stocks have been traded in money market after the result of general meeting of shareholders released and before the announcement in KSEI.

For further research, the writer suggests that the next researcher can use other corporate event aside from stock split announcement event as the main event to prove semi-strong form of market efficiency, also looking for deeper information about corporate action or event so the criteria of sample will be clearer. The writer also suggests next researcher to use announcement date derives from general meeting of shareholders (RUPS) instead of KSEI. The delay of RUPS announcement date and it's cum date is four weeks, while in KSEI, the delay of announcement date and it's cum date is only around three days. This huge difference in announcement date creates possibility that investors already conduct trading activity in money market before the announcement in KSEI is being released. This activity will affect validity of stock return analysis few weeks before cum date and ex-date. Because of that, it will be better if next researcher use the date from general meeting of shareholders and make longer period of analysis.

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