



PRIMARY RESEARCH

The effect of market volatility and firm size towards the difference of market reaction around stock-split announcement in Indonesia stock exchange

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Index Terms

Stock split
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Firm size
market capitalization
Cumulative abnormal return
Investors' reaction
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Abstract. The primary objective of a company is to increase the wealth of the shareholders. Every decision, policies or action must be made to favor the shareholders. Corporations conduct corporate actions to improve their performance or increase the wealth of the shareholders. Stock split is one of the several corporate measures perceived to be a positive corporate action. In this paper, the researcher wants to study factors that can affect investors' reactions towards the same corporate action: stock split. It is believed that market volatility can cause a difference in investors' reactions towards the same positive corporate action (stock split) as studied before. To analyze this, the researcher will first classify the stock split result in Cumulative Abnormal Return (CAR) based on the volatility of the period that the stock split is conducted in and the firm size that performs the stock split. The researcher will use one-way ANOVA to find out if there is a statistically significant difference in market reaction towards the stock-split event based on those two classifications. The researcher found that investors react differently towards the stock-split event in different market volatility conditions. It is also found that there is no difference in investors' reaction towards stock split based on firm size. The researcher also conducts further research and found that investors react differently in different market volatility conditions in firms with small and medium market capitalization. While as in firms with large market capitalization, it is found that there is no statistically significant difference in investors' reaction towards stock splits that are conducted in various market volatility conditions.

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INTRODUCTION

The primary purpose of a company is to add benefit for the shareholders. This means that all corporate actions conducted by a corporation must benefit the shareholders to establish long-term cooperation. In a listed company, the liquidity of the stock is one of the factors that can increase the attractiveness for investors to invest in the enterprise.

When the stock price has already reached certain level of price, the liquidity decreases as more individual investors can't afford the high price of the stock. To make sure the liquidity of the stock is maintained at the same time without changing the value of the company, company usually executes "stock split." In a stock split, a specific number of new shares are substituted for each outstanding share. The

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main changes are par-value and number of shares outstanding adjusted by the split variable. All publicly-traded corporations have a set number of shares that are being traded on money markets. A stock split is a choice by the corporation's board of director to build the quantity of shares by issuing more shares to current shareholders. For instance, in a 2-for-1 stock split, each shareholder with one stock is given an extra share. Along these lines, if an organization had 10 million shares outstanding before the split, it will have 20 million shares outstanding after a 2-for-1 split.

A stock's price is likewise influenced by a stock split. Brennan & Hughes (1991) after a split, the stock price will be diminished following the quantity of shares outstanding has expanded. In the case of a 2-for-1 split, the offer cost will be divided. Along these lines, in spite of the fact that the quantity of outstanding shares and the stock value change, the business sector capitalization stays consistent. Conroy & Harris (1999) a stock split is generally done by organizations that have seen their share price increment to levels that are either too high or are past the value levels of comparative organizations in their division. The essential thought process is to make shares appear to be more reasonable to small investors despite the fact that the underlying value of the corporation has not changed. Ikenberry & Ramnath (2002) while a stock split is just a change in the denomination of the value of a firm on paper, it has been researched that a positive cumulative abnormal return usually occurs around the announcement dates for the splits (Fama, Fisher, Jensen & Roll, 1969).

These mean stock splits can also result in a stock price increase following the immediate decrease after the split. Since many small investors perceive the stock is presently more reasonable and purchase the stock, they wind up boosting interest and drive up share price. Another explanation behind the cost increment is that a stock split gives a sign to the market that the organization's offer cost has been expanding and individuals accept this growth will proceed later on, and once more, lift demand and prices. The primary concern is that a stock split is utilized essentially by corporations that have seen their share price increase generously and despite the fact that the quantity of outstanding shares increments and the decrease in price per share, the market capitalization (and the value of the corporation) do not change. Therefore, stock splits make shares more buyable to small investors and give more noteworthy attractiveness and liquidity in market. Martin, William, Arthur & David (1999) mentioned several reasons that managers perform stock split which are:

- a. To prevent the share price from being too expensive so the number of shareholders can keep growing.
- b. To return the price and average trading volume of the stock back to the targeted range.
- c. To signal information about future investment opportunity regarding profit growth and dividend.

Stock split is executed when the share price has already been considered too high that can limit the buying power of the investor. By performing the split, the stock price will fall and is expected to attract small investors. The stock split will automatically result in the increase in the number of shares so that investors related to the activity can rearrange their investment portfolio. For that, information about the stock split and the motives of the company are a crucial information for the investors in making the decision to buy, hold or sell the stocks based on the analysis of information that comes with the stock split (Ikenberry, Rankine & Stice, 1996) However, based on the history of stock split actions done by companies in Indonesia Stock Exchange (IDX), not all companies gain benefit as mentioned above. It is true that stock split is considered as good signal and many companies have gained benefit from the stock split announcement. But, there are several companies that experienced negative abnormal return on their share price after the announcement of the split.

The author wants to research if market volatility has a role in the different results of the stock split announcement. This paper concentrates on a more refined expectation of the data content hypothesis. On the off chance that the data substance of the declaration is value-pertinent, then it takes after that a signal might be more darkened amid times when market volatility is high and business sector "noise" rises, and that a sign might be better to be sent when the business sector is moderately quiet, such that hand-waving is more successful consideration. Also, we analyze whether any conclusion can be pulled out regarding stock split in large versus small firms. In this research, the researcher will focus on the stock split announcement, specifically the split-up only (excluding reverse stock split) of the companies done from 2010 to 2015. The research aims to test whether market volatility can affect the difference of stock split results between companies who experienced positive impact after the split and companies who experienced the negative impact regarding (CAR) before and after the split. The research will identify whether the stock split, whose initial purpose is to increase the liquidity and the price of the share by boosting the attractiveness of the company's stock price is affected by market volatility and firm size

which can cause the stock split news to be perceived differently. The researcher will determine the result to be positive or negative by dividing the stock split event into three major parts; The pre-split event which ranges for two days before the stock split announcement, the stock split day which is the date of the stock split being executed and the post-split event which is analyzed until two days after the stock-split execution. Within this time measure, the researcher will decide how the stock split affects the stock price performance. CAR was recorded during the window surrounding each stock split announcement. During the 5-day period, the researcher will analyze whether market volatility and firm size affect the result of the stock-split execution in terms of the cumulative abnormal return. The objectives of this research are:

1. To find the difference in abnormal return around the stock split announcement during high and low market volatility
2. To find the difference in abnormal return around the stock split announcement done by small firms, medium firms, and large firms
3. To find the interaction between market volatility and firm size that can affect the result of the stock split

THEORETICAL FOUNDATION

Stock split is executed when the stock price in the market has been considered too high, and the company believes a lower share price will result in better marketability and broader distributions. By this, the company can decide to exchange the shares outstanding by using a corporate action called a stock split. Stock split is a corporate activity that splits some shares into n number of shares, whereas the new price per share after the stock split is $1/n$ of the previous price per share (Jogiyanto, 2003). There are two kinds of stock split that can be executed; one is split up, and the other one is split down/reverse split. The reverse split is the increase in price per share and decreases the number of shares outstanding.

Example for reverse split are split factors of 1:2; 1:3; and 1:4. Split up is the decrease of price per share which results in the increase of shares outstanding. The example for split up are the split factors of 2:1; 3:1; and 4:1. The comparison between the previous number of shares outstanding and the new one is called split ratio. For example 2:1 means one share will be split into two shares with new nominal (Basir & Fakhruddin, 2005). A split up can attract the investor, making the stock be more liquid in the market (Widiastuti & Usmara, 2005). A split up executed by a com-

pany can be a two-for-one stock, which means each of the shareholders will receive two shares for each share owned previously, whereas the new share price will be half of the previous share, or with three-for-one- stock, which means the shareholder will receive 3 shares for each share owned previously, with the new share price for a third of previous share price and so on. By doing so, the total equity of the company stays the same and will not experience change (Rohana & Mukhlisin, 2003). According to Dewi (2000), the stock market in America that is represented by New York Stock Exchange (NYSE) has a regulation regarding the stock split. NYSE classifies the stock split into two, which are partial stock split and full stock split. The partial split is the increase of shares distributed by 25% but less than 100% of the current shares outstanding. The full split is the increase in shares outstanding as much as 100% or more based on the current shares outstanding. By all means, the purpose of stock split is to ensure the stock to be liquid due to the increased trading volume and attractiveness for the investor.

Stock split can “wake” a “sleeping” stock that will be very beneficial to increase company’s performance in the stock market. Two possible factors can cause a stock to be inactive; the first is because the stock is prospective and issues regular dividend which means the stock is very attractive for the long-term investor, so the stock is not regularly traded due to the hold action by the investor. Secondly, the stock is considered unattractive and not prospective. With this condition, the stock split is responded by investor positively, which is shown by the increased transaction frequency that is resulted by the increased liquidity of the stock (Basir & Fakhruddin, 2005).

According Sutrisno, Soffy & Francisca (2004) stock distribution in the form of stock split is executed just for the sake of cosmetic changes because stock split doesn’t affect the cash flow of the company and investors’ ownership proportion. But, different opinion was stated by Sutrisno *et al.* (2004) which states that a stock split can bring back a stock price per share to an optimal trading range and increase the liquidity. Company that executes stock split on the stock will attract investor by lowering the share price which will result in the increase of shareholders after split announcement. The impact of stock split towards the return for investor was explained by Sutrisno *et al.* (2004) that there is abnormal activity in the stock trading around the split announcement. Meanwhile, Sutrisno *et al.* (2004) conclude that the existence of anomaly caused by the split will increase the company’s profit. Theoretically, the mo-

tives behind the stock split as well as the impacts are aligned with the theories below (Rohana & Mukhlisin, 2003):

a. Trading range theory

b. Signaling theory

Bar- Josef and Brown in Marwata (2001) stated that in signaling theory, the stock split provides information for the investor about the substantial return growth in the future. The growth in return can be predicted and is a signal for short-term and long-term profit. Doran in Khomsiyah (2001), stated that analyst would perceive the signal and use it to predict long-term-earning growth. Market reaction towards stock split is not because of the split action itself which is economically valueless, but about the future prospect of the company that is signaled by the activity. Not all companies can execute stock split. The only company that suits the signaling condition can benefit from the stock split. The company that provides invalid signal will receive bad impacts. If a company without good prospect tries to signal through stock split, it will instead lower the share price if the market knows the current bad condition of the company (Wahyu & Jogiarto, 2000).

Market Volatility

There have been numerous studies regarding stock market volatility. One clarification of business sector unpredictability relates liquidity danger to the current monetary change. Liquidity can be characterized in no less than two diverse ways. The principal identifies with that it is so natural to exchange the security, which is identified with exchanging volume and little offered ask spreads as depicted by (Brunermeier & Pedersen, 2009). The second is financing liquidity identified with the assets accessible to an imminent purchaser or seller. Volatility is defined using two methods; (1) the standard deviation of returns and (2) large single day price changes (Mansur, Cochran & Phillips, 1991).

Daily closing prices for the Jakarta Composite Index are used to calculate standard deviations on a monthly basis and for various four-year intervals for January 2011 through December 2015 period. Past research, including Lang & Lundholm (1993), states that high volatility might be an intermediary for the data environment. Docking & Koch (2005) in their investigation of profit change announcements, find that announcement to lower profits are trailed by a more prominent decline in stock cost amid times of volatility and high market returns. Since there is proof that diverse data situations influence abundance of stock returns around stock split announcements (Chern, Tandon, Yu & Webb, 2008), stock value instability can be utilized

as a measure of the data environment (Lang & Lundholm, 1993). Also, stock market volatility indeed has an impact on overabundance of stock returns around another corporate announcement (Docking & Koch, 2005). Our intent is to provide further insight by separately examining the price impact of stock splits during different volatility regimes by using the standard deviation of the market return as volatility measurement. Two techniques are utilized as a part of this study to measure volatility and evaluate changes in its level after some time: (1) substantial single day price changes and (2) the standard deviation of returns.

Considering the main technique, the essential issue is the way everyday price changes ought to be figured. Frequent volatility in the stock exchange is represented by outright price changes. At the point when looking at information after some time, which is the embodiment of market volatility, percentage price changes must be utilized. Moreover, percentage price changes or returns can be figured in a few courses with, perhaps, the most broadly utilized being the number arithmetic return. Notwithstanding, it is desirable over figure rate cost changes in log contrast structure as a result of this present technique's symmetric treatment of cost increments and declines, and this is the methodology that is used as a part of this study. Characterizing P_t as today's cost and P_{t-1} as yesterday's value, today's return or log rate change in value, R_t , might be composed as,

$$R_t = (\ln(P_t) - \ln(P_{t-1})) \times 100 = \ln(P_t/P_{t-1}) \times 100 \quad (2.1)$$

The second measure of instability is the standard deviation of returns, which is figured on both a month to month premise and for different five-year intervals. For every month or five-year interval, costs are changed over into natural logarithms, and the mean and standard deviations are ascertained for the log contrasts between days inside every month or five-year interval. Both measures of volatility, single-day price changes in log difference form and standard deviations of returns, are calculated over the January 2011 - December 2015 period utilizing day by day information for the Jakarta Composite index.

Firm Size

Yasmin & Yusuf (2008) stated that market capitalization (usually called Market Cap) is a measurement of company size. Market cap refers to the value obtained from the company's number of shares outstanding multiplied by the current share price (current stock price). Briefly, Market Cap can be interpreted as a price needed to be paid by someone

to become the largest shareholder of a company. The size of the company is the basic determinant (basic determinant) on asset allocation (asset allocation) and the risk-return parameters for stocks and mutual fund shares. According to Yocelyn & Christiawan (2013), classification of market capitalization in Indonesia can be categorized into:

1. Blue Chip stock– Big Cap Company with total market capitalization above 40 trillion Rupiah
2. Second Layer stock – medium cap Company with total market capitalization between 1 trillion Rupiah and 40 trillion Rupiah
3. Third Layer stock – small cap

Company with very small total market capitalization, which is below 1 trillion Rupiah. Little (2014) explains that the stock market and investors treat companies differently, depending on the size of the company. Market Cap is used as the means most convenient to compare one company with another company. Furthermore, Little (2014) also explains that the Market Cap is an easy concept to grasp. Market Cap is the answer to the question: How much should we pay to buy all the outstanding shares of a company? The importance of market cap in decision making by investors can be seen on the popular investment trend in recent decades. In investing, investors tend to judge companies based on size. Several investors limit their choices only to firms of a certain size, even not few investors who use Market Cap as the main criteria in investing. Not a few investors who choose to deploy money into the various companies with diverse market cap (Yasmin & Yusuf, 2008).

Market Model-Adjusted Return

The expected return is calculated based on single index market model. α_i and β_i will be used as the parameters of the market model. This model is estimated using Ordinary Least Square (OLS) regression over the estimation time. This method is often found being used as the model to calculate expected return in previous event studies because this method can control the relationship between market returns and stock returns. Moreover, this method allows the risk to vary based on the associated stock.

$$(R_i, t) = \alpha_i + \beta_i * R_{m, t} \quad (2.2)$$

Abnormal Return

Abnormal return or excess return is the difference between the expected return and the actual return on time (t) of an individual stock (Sitthipongpanich, 2011). The abnormal return will be positive if the actual return is greater than

the expected return. Meanwhile, the abnormal return will be negative if the actual return is smaller than the expected return. Abnormal return can happen because of the certain events such as national holiday, the beginning of a month, uncertainty in the political climate, initial public offering, stock split, and some other extra-ordinary phenomena. Event study will analyze the abnormal return from stock that might happen because of the announcement of certain event.

$$AR_{i,t} = R_{i,t} - E(R_i, t) \quad (2.3)$$

Cumulative Abnormal Return

Cumulating abnormal return across time yields the cumulative abnormal return measure:

$$CAR_i(\pi_1, \pi_2) = \sum_{t=T_1}^{T_2} AR_{i,t} \quad (2.4)$$

Previous research by Johnson & Stretcher (2009) expressed that while positive abnormal stock returns around stock split declarations that have been archived for a considerable length of time, new proof was found that these abnormal stock return shifts depend on the level of market volatility. Positive CARs around stock split declarations, 1) are driven by times of low unpredictability and 2) are more critical for small firms. For small firms, in times of low volatility, there may exist gains from declaring a stock split. There exists prove that small firms abhor the same gains amid times of medium and high volatility. Lang & Lundholm (1993), conjecture that high volatility may be a proxy for the information environment. Stock price volatility can be used as a measure of the information environment.

Atiase (1985) and Freeman (1987) provide evidence that a greater proportion of earning information is impounded in stock prices prior to corporate announcements for large firms than for small firms, suggesting that the amount of information provided by and about firms is increasing in firm size. Docking & Koch (2005) in their study of dividend change announcements, find that announcements to dividends are followed by a greater decrease in stock price during periods of high volatility and high market returns, which means that stock market volatility does have an effect on excess stock returns around another corporate announcement, dividend changes (Docking & Koch, 2005).

RESEARCH METHODOLOGY

In this research, author will analyze the effect of market

volatility and firm size towards the reaction of the stock split announcement to know whether there is significant correlation between them. The existence of cumulative abnormal return will be analyzed to know how the market perceives the event. After that, the cumulative abnormal return is then grouped twice, first is grouped based on the volatility and the second is based on market cap. Lastly, we combine the result based on volatility and market cap to draw conclusion whether these two factors have impact on the results. In this research, the population is the stocks of the companies which are listed in Indonesia Stock Exchange and then stock split (split up) will be conducted. The reason in choosing the company that only conducts split up is to make it more comparative. The sample used in this research will be chosen with purposive sampling method which is limited to several criteria:

1. The stock is listed in Indonesia Stock Exchange which is enlisted during the event period.
2. The stock of companies that conduct stock split up
3. The stock is actively traded during the research period judged from daily volume and price changes.
4. The stock's data are still available at yahoo finance.

Analysis Steps

Analysis is conducted by event study method to organize and discuss the data collected. The event study method will follow the following procedures.

1. Determine the stock samples of the events that will be observed

The stock samples of the events will be taken via purposive sampling from companies listed in Indonesia Stock Exchange that execute stock split up.

2. Determine the market volatility

$$R_t = (\ln(P_t) - \ln(P_{t-1})) \times 100 = \ln(P_t/P_{t-1}) \times 100$$

3. Classify the market volatility

Low volatility: if the event occurs during standard deviation tertile 0

Medium volatility: if the event occurs during standard deviation tertile 1

High volatility: if the event occurs during standard deviation tertile 2

4. Determine the day of the event and the research pe-

riod for each stock

The research period for each stock will be conducted within 5 days; 2 days before the split announcement, the day of the split announcement and 2 days after the split announcement. If the day is holiday for stock trading activity, the next day will be used.

5. Calculate the daily return of all the stock samples

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

$R(i, t)$ = Actual return of stock i in the period t

$P(i, t)$ = The price of stock i in the period of t

$P(i, t - 1)$ = The price of stock i in the period of t-1

6. Calculate the expected return

$$E(R(i, t)) = \hat{\alpha}_i + \hat{\beta}_i * R_{m,t}$$

$E(R(i, t))$ = Expected Return of stock i in the period t

$R(m, t)$ = Market Return in the period t

7. Calculate the abnormal return

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

$AR_{i,t}$ = abnormal return of stock i in the period t

R_i, t = actual return of stock i in the period of t

$E(R_i, t)$ = expected return of stock i in the period of t

8. Calculate the cumulative abnormal return

$$CAR_i(\pi_1, \pi_2) = \sum_{t=T_1}^{T_2} AR_{i,t}$$

Analysis Techniques

Methods to answer research questions of difference in car based on volatility

To answer research question 1, the researcher will classify the CAR based on the volatility of the month the stock split was conducted in. The market volatility is classified into three groups, low volatility, medium volatility and high volatility using the mean and ranking method. The researcher will then calculate each split's cumulative abnormal return and group it based on the month of the split. The results will be:

Category	Mean CAR	S. D of CAR
Low	CAR0	STD0
Medium	CAR1	STD1
High	CAR2	STD2

CAR0 = for stock splits occurred during low volatility

CAR1 = Average CAR for stock splits occurred during medium volatility

CAR2 = Average CAR for stock splits occurred during high volatility

STD0 = Standard deviation of CAR for stock splits occurred during low volatility

STD1 = Standard deviation of CAR for stock splits occurred during medium volatility

STD2 = Standard deviation of CAR for stock splits occurred during high volatility

Methods to answer research question of difference in car based on market capitalization

Classify the firms into three groups (small, medium and big). The abnormal return of the stocks will be classified based on the market capitalization. Firm's size is classified based on the market capitalization under this category:

- a. Small Size (< 1 Trillion Rupiah market capitalization)
- b. Medium Size (1 - 40 Trillion Rupiah market capitalization)
- c. Large Size (>40 Trillion Rupiah Market Capitalization)

Category	Mean CAR	Standard deviation of CAR
Small	CAR0	STD0
Medium	CAR1	STD1
Large	CAR2	STD2

Whereas:

CAR0 = Average CAR for stock splits conducted by small firms

CAR1 = Average CAR for stock splits conducted by medium firms

CAR2 = Average CAR for stock splits conducted by large firms

STD0 = Standard deviation of CAR for stock splits conducted by small firms

STD1 = Standard deviation of CAR for stock splits conducted by medium firms

STD2 = Standard deviation of CAR for stock splits conducted by large firms

F-test is then conducted to see if there is a statistically significant difference in the abnormal return of the stock splits.

Data Analysis

The primary objective of this chapter is to present the gathered data and the analysis of the data. The objects of this research are stocks that conduct stock split (split up) dur-

ing the year 2010. The data of cumulative abnormal return, which are classified into two categories, the market volatility, and the firm size will be used to test the hypotheses. Lastly, the researcher also tests if there is an independent relationship between market volatility and firm size. The test will be conducted with the help of SPSS program and also Microsoft Excel. The data will be presented in form of the table followed by a brief description in words. This chapter consists of 3 sections. Section 1 provides the descriptive statistics of the data. Next section presents the data analysis results, and the last section presents the discussion of the findings.

CAR Classification Based on Market Volatility

This test is started by calculating the cumulative abnormal return of the stocks that conduct stock split. Then, the result is classified into 3 groups, which is based on the volatility of the month the stock split is conducted in. The volatility is classified into 3 groups based on the lower, middle and upper tertile of the volatility within 6 years. The descriptive statistics can be seen in Table 1.

TABLE 1 . Average car based on volatility classification

Category	Mean Volatility	Mean CAR	S. D of CAR
Low	0.029113	0.060076	0.017
Medium	0.040137	-0.028650	0.0695
High	0.080230	0.008226	0.04641

The data in the table report that: a) During low volatility period, the mean CAR recorded is 6% which shows that the companies in average experience a positive cumulative abnormal return during low volatility with a fairly lower standard deviation as well comparing to the other categories. b) During medium volatility period, the mean CAR recorded is -0.03% which shows that the companies in average experience a negative cumulative abnormal return during medium volatility with a high standard deviation comparing to the other categories.

c) During high volatility period, the mean CAR recorded is 0.008% which shows that the companies in average experience a pretty small positive cumulative abnormal return during high volatility with a fairly higher standard deviation comparing to the low category.

F-test is then conducted to test if the difference is significant. The test is conducted to check the significance of difference in the CAR during the 5-day window. Our null hypothesis is: CAR0 = CAR1 = CAR2. This shows that the stock market has reacted significantly different towards stock

split announcement in different market volatility which resulted in significant difference in CAR of the stocks that announce stock split. Therefore, the null hypothesis is rejected and the hypothesis which states that the stock market does react differently to the stock split that is conducted in different volatility is accepted.

TABLE 2 . Difference in CAR significance for volatility classification one-way ANOVA results

Category	Mean CAR	F-stat	Sig.
Low	0.060076		
Medium	-0.028650	7.141	0.003
High	0.008226		

CAR Classification Based on Firm Size

This test is started by calculating the cumulative abnormal return of the stocks that conduct stock split. Then, the result is classified into 3 groups, which is based on the firm size (market capitalization). The market capitalization is classified into 3 groups based on the lower, middle and upper tertile within 6 years. The descriptive statistics can be seen in table 3. Table 3 demonstrates the descriptive statistics of the mean of the CAR and the mean market cap of the company in which stock split is conducted. The data in table 4.2 report that:

TABLE 3 . Average CAR based on market capitalization classification

Category	Mean market Cap (in trillion Rupiah)	Mean CAR	S. D of CAR
Small	277.028	-0.019001	0.064984
Medium	11.954.413	0.004618	0.067552
Large	195.113.930	0.030767	0.025432

Average CAR based on market capitalization classification

- In firms with small size, the mean CAR recorded is -0.019% which shows that small companies in average experience a negative cumulative abnormal return with a fairly higher standard deviation than the larger company.
- In firms with medium size, the mean CAR recorded is 0.0046% which shows that medium companies in average experience a pretty small positive cumulative abnormal return with a higher standard deviation than the other categories.
- In firms with large size, the mean CAR recorded is 0.031% which shows that large companies in average experience positive cumulative abnormal return with a lower standard deviation than the other categories. F-test is then con-

ducted to test if the difference is significant. The test is conducted to check the significance of difference in the CAR during the 5-day window. Our null hypothesis is: $CAR_0 = CAR_1 = CAR_2$.

TABLE 4 . Difference in CAR significance for volatility classification one-way ANOVA results

Category	Mean CAR	F-stat	Sig.
Small	-0.019001		
Medium	0.004618	1.024	0.370
Large	0.030767		

One-way ANOVA result of CAR difference based on market capitalization classification

This shows that the stock market does not react significantly different towards stock split announcement in different firm sizes which resulted in insignificant difference in CAR of the stocks that announce stock split. Therefore, the null hypothesis is accepted and the hypothesis which states that the stock market does react differently to the stock split conducted by firms with different size volatility is rejected.

CAR Classification Based on Market Volatility and Firm Size Combined

This test is started by calculating the cumulative abnormal return of the stocks that conduct stock split. Then, the result is classified into 9 groups, which is based on the market volatility and firm size (market capitalization). The descriptive statistics can be seen in table 5.

TABLE 5 . Average CAR based on volatility and market capitalization combined classification

AVERAGE CAR volatility		Volatility		
		Low	Medium	High
Size	Small	0.067305	-0.05004	-0.06745
	Medium	0.059258	-0.02807	0.011321
	Large	0.049703	0.0511	0.021

The table demonstrates the descriptive statistics of the mean of the CAR based on the combined classification of market volatility and size of firm in which stock split is conducted. The data in table report that:

- Firms with small size experience a positive CAR during low volatility period and suffer negative CAR in other volatility period
- Firms with medium size experience a higher positive CAR during low volatility period than during high volatility period but suffer negative CAR in other volatility period

- c) Firms with large size experience a positive CAR in any kind of volatility period
- d) Firms that conduct stock split during low volatility period experience a positive CAR
- e) During low volatility period, small firms experience the highest CAR than firms with medium size and large size. Further testing is conducted to see a more specific relation of market volatility on firms with different size. The sample used is the companies with small, medium and large market cap that conduct stock split during low, medium and high volatility and the variable is measured by CAR, which is obtained from 2 days before until 2 days after. Our null hypothesis is: $CAR_0 = CAR_1 = CAR_2$

TABLE 6 . Difference in CAR significance for stock split conducted by companies with small cap in different market volatility one-way ANOVA results

Category	Mean CAR	F-stat	Sig.
Low	0.067305		
Medium	-0.05004	9.955	0.028
High	-0.06745		

One-way ANOVA Result of CAR Difference in Small-cap Firms based on Volatility Classification

This shows that the stock market does react significantly different towards stock split announcement in different market volatility for small firms. This proves that stock splits conducted by small firms are perceived differently by the market which resulted in significant difference in CAR of the stocks that announce stock split. Therefore, the null hypothesis is rejected and the hypothesis which states that the stock market does react differently to the stock split conducted by small-cap firms in different market volatility is accepted.

TABLE 7 . Difference in CAR significance for stock split conducted by companies with medium cap in different market volatility one-way ANOVA results

Category	Mean CAR	F-stat	Sig.
Low	0.059258		
Medium	-0.02807	3.489	0.050
High	0.011321		

One-way ANOVA Result of CAR Difference in Medium-cap Firms based on Volatility Classification

This shows that the stock market does react significantly different towards stock split announcement in different market volatility for medium firms. This proves that

stock splits conducted by small firms are perceived differently by the market which resulted in significant difference in CAR of the stocks that announce stock split. Therefore, the null hypothesis is rejected and the hypothesis which states that the stock market does react differently to the stock split conducted by medium-cap firms in different market volatility is accepted.

TABLE 8 . Difference in CAR significance for stock split conducted by companies with large cap in different market volatility one-way ANOVA results

Category	Mean CAR	F-stat	Sig.
Low	0.049703		
Medium	0.0511	0.835	0.515
High	0.021		

One-way ANOVA Result of CAR Difference in Large-cap Firms based on Volatility Classification

This shows that the stock market does not react significantly different towards stock split announcement in different market volatility for large firms. This proves that stock splits conducted by large firms are perceived similarly by the market which resulted in insignificant difference in CAR of the stocks that announce stock split. Therefore, the null hypothesis is accepted and the hypothesis which states that the stock market does react differently to the stock split conducted by large-cap firms in different market volatility is rejected.

RESULTS AND DISCUSSION

Based on the research, it is found that the market does react differently to stock-split announcement during different market volatility. In other words, what currently is going on in the market matters to the company that wants to conduct stock split. This is seen on the significant difference in the CAR experienced by the companies that conduct stock split in different market conditions measured by market volatility. It is also shown that during low volatility condition, stock split which is generally perceived as good news is accepted well by the market and thus resulting in positive abnormal return for companies that conduct stock split during the low volatility condition. Additionally, during medium and high volatility, the good news is believed to be mixed by other sentiments that might make the news to be exaggerated, positively or negatively. Based on the research, it is found that the market does not react differently to stock-split announcement conducted by firms with small, medium and large market capitalization. In

other words, the size of the company that wants to conduct stock split does not matter much for the investor. This is seen by the insignificant difference in the CAR experienced by the companies with different market capitalization that conduct stock split. But interestingly it is found that small-cap firms experienced significantly more positive cumulative abnormal return when the stock-split announcement is conducted during low market volatility condition. Medium-cap firms also experienced the same when the stock-split announcement is conducted during low market volatility condition. Although the medium-cap firms still experience a positive cumulative abnormal return during high volatility, it might be because there are still several medium-cap firms that are already trusted and believed by the market to be a good company. On the other hand, it is found that large-cap firms experienced positive cumulative abnormal return when the stock-split announcement is conducted regardless of the market volatility condition. In other words, the market volatility condition does not matter for large-cap firms when they want to conduct stock split. This is supported by the one-way ANOVA test that shows insignificant difference in the CAR of the stocks that conduct stock split conducted in different market condition. Looking at the statistics, most large-cap firms experience positive CAR in every market condition. This might be caused by the market positive perception about large-cap firms which are generally perceived to be a strong company. So, investors might perceive stock split conducted by large-cap firms as good signaling, thus the stock split is reacted positively regardless of the market condition.

CONCLUSION AND IMPLICATIONS

Based on data analysis, conclusions that can be made are:

1. Indonesia stock exchange market does react differently

towards stock split announcement based on different market volatility conditions. This is caused by the difference in information absorption during low, medium and high volatility market conditions.

2. Indonesia stock exchange market does not react differently towards stock split announcement based on the firm size. This is caused by the fact that stock split might be perceived as good news regardless of firm size, therefore no significant difference in the reaction.

3. There is a significant difference in investors' reaction for small firms and medium firms during different market volatility condition. But, there is no difference in investors' reaction for large firms during different market volatility condition. This is caused by investors' perception that low and medium firms are not strong enough to handle different market volatility. On the other hand, large-cap firms are perceived by the market as strong companies that can endure different market volatility conditions, that is why investors do not react differently for large firms.

The result of this paper can be the consideration for investors to anticipate events related with stock split. They should put more concern on the market volatility and at the same time determine the category of the firms based on size for reference to get more accurate investment. If the investor wants to trade small and medium-cap stocks, it is recommended to trade during low volatility period since it brings a better excess return. For large cap stocks, volatility is not a main factor but it is still recommended to trade all corporate actions during low volatility period since the information is received better by the market. To improve this research, for the next study on events related to stock split, further study regarding why the difference exists can be conducted to add more reference for investors.

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