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Analysis of Differences in Stock Trading Volume, Bid-Ask Spread, and Abnormal Returns Before and After a Stock Split: Empirical Evidence from Companies Listed on the Indonesian Stock Exchange

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Abstract

A stock split is a company activity carried out in the capital market by splitting the number of shares when the share price does not increase to make it affordable for investors. The research objective is to analyze differences in stock trading volume, bid-ask spread, and abnormal returns before and after the stock split. The research population was all corporations listed on the Indonesia Stock Exchange (BEI) and practicing stock splits in 2018-2022, totaling 42 companies. The research sample included some corporations listed on the IDX and practicing stock splits in 2018-2022 and fulfilling the purposive sampling technique, namely not carrying out other corporate actions in the window period of 5 days before and 5 days after the stock split, totaling 36 companies. The data analysis technique uses the Wilcoxon signed-rank test. The research results show (1) no difference in stock trading volume and bid-ask spread before and after the stock split; (2) there are differences in abnormal returns before and after the stock split.

Keywords: *Stock Trading Volume, Bid-Ask Spread, Abnormal Return, Stock Split*

Abstrak

Stock split merupakan sebuah aktivitas perusahaan yang dilakukan di pasar modal melalui pemecahan jumlah lembar saham pada saat tidak naiknya harga saham sehingga dijangkau investor. Tujuan penelitian menganalisis perbedaan volume perdagangan saham, *bid-ask spread,* dan *abnormal return* sebelum dan setelah *stock split.* Populasi penelitian semua korporasi yang tercatat di Bursa Efek Indonesia (BEI) dan mempraktikkan *stock split* tahun 2018-2022 sejumlah 42 perusahaan. Sampel penelitian sebagian korporasi yang tercatat di BEI dan mempraktikkan *stock split* tahun 2018-2022 serta memenuhi teknik *purposive sampling* yaitu tidak melakukan aksi korporasi lainnya pada periode jendela 5 hari sebelum dan 5 hari sesudah *stock split* sebanyak 36 perusahaan. Teknik analisis data menggunakan uji beda *wilcoxon signed rank test*. Hasil penelitian menunjukkan (1) tidak terdapat perbedaan volume perdagangan saham dan *bid-ask spread* sebelum dan setelah*stock split*; (2) terdapat perbedaan *abnormal return* sebelum dan setelah *stock split*.

Kata kunci: Volume Perdagangan Saham, *Bid-Ask Spread, Abnormal Return,* Pemecahan Saham

1. Introduction

Economic factors and non-economic factors can encourage a country's economic growth (Olokoyo, Ibhagui& Babajide, 2020). One of the economic factors in economic growth that has an important role is business capital, which is related to increasing capital in the form of investment which will increase capital stock and increase income for investment functions as a source of funding. According to Al-Kandari & Abul (2019), economic growth factors are determined by high savings and investment where the preferred means of investing capital can be through the capital market. The capital market

functions in the development of the country's economy by bringing together investors and issuers.In addition, the capital market provides opportunities for fund owners to receive profits and returns based on the characteristics of the investment chosen (Onofrei, Cărăuşu& Lupu, 2019).

Investing in stocks in the capital market is a popular investment choice for trading. According to Nicolescu (2020), investors in making investment decisions need various information related to the shares they will own in order to get the expected benefits. One of the pieces of information that investors need to know is regarding the corporate actions carried out by the company. The corporate action that many companies carry out in the capital market is stock splits. Based on data for the last 5 years from 2018 to 2022, there are 42 issuers on IDX which applies the stock split (www.idx.co.id).

Stock splits are carried out with the aim of the company increasing the quantity of shares in circulation, when they see share prices rising too much and suppressing investors' ability to buy shares even though the upward trend in price movements attracts them (How & Tsen, 2019).Price movements that tend to rise indicate that stocks are in great demand, indicating high levels of supply and demand in the market. With stock splitting activities, stock prices can be affordable for investors and that price will make trading liquidity increasing (Putra & Suarjaya, 2020). This is consistent with Trading Range Theory which interprets stock prices that are too high to cause inactive stock trading and as a result encourage companies to carry out stock splits (Ferreira et al., 2019). Stock splits are carried out so that the share price is not too high for investors to obtain and share liquidity increases. According to Daadaa (2021), investors need to know the liquidity of a share, because the more liquid a share, the higher the interest in investing in that share. Testing stock liquidity is seen from stock trading volume and the difference in bid and offer prices, namely the bid-ask spread (Darmadji & Fakhrudin, 2011).

According to Harjoto et al. (2019), stock trading volume is a parameter used to see the impact of the number of shares traded on a particular event which is tested using Trading Volume Activity (TVA). Companies that carry out stock splits will increase demand for shares so that they can increase share trading volume (Khajar, 2016).The more shares traded, the greater the TVA value. This indicates that more and more investors are interested in investing in shares traded by companies (Gunarti, 2018). However, there are several conflicting research results related to stock trading volume with stock splits. It includes the studies conducted by Luh & Yasa (2019); Tanoy (2020);Irvangi& Rahmani (2022) which shows that before and after the stock split announcement there were differences in TVA. In contrast to this research, the research results of Amin (2020); Zakiyah &Nurweni (2020) stated that before and after the stock split announcement there was no dissimilarity in TVA.

The next indicator of stock liquidity is the bid-ask spread. Based on Le & Gregoriou (2020), they describe the bid-ask spread as the difference between the highest buying price and the lowest selling price at the end of each stock trading session on the IDX. Therefore, it will encourage companies to carry out stock splits to lower share prices to make them more accessible to investors and cause demand for shares to increase and end up becoming more liquid.There is research that has been conducted regarding bid-ask spreads and stock splits but has inconsistent results, including other research conducted by Luh & Yasa (2019);Irvangi & Rahmani (2022) which states that after the stock split there is a shrinking of the bid-ask spread which indicates an increase in stock liquidity. However, research results found by Safira &Simon (2016); Hagströmer (2021) stated that before and after the stock split there was no change in the bid-ask spread.

Investors can control shares with companies that carry out stock splits that are not too high, causing a market reaction and increasing share prices. The disparity between actual returns and expected returns is in the form of abnormal returns (Verawaty, Noviardy & Salindra, 2018).Abnormal returns occur because of stock split events. According to Signaling Theory, by conducting a stock split the company conveys information to current and potential investors about the possibility of a significant profits

grow in the future. Thus, investors will conduct stock transactions since they know the company's future prospects. The transaction actions indicate that the market is reacting. The market reaction can be assessed from the positive abnormal return value for good news and the negative abnormal return value for bad news (Tandelilin, 2017: 576). Abnormal returns that show a positive value indicate that the actual return is higher than the expected return so that investors are interested in carrying out stock transactions. On the other hand, stock split is considered to have no information if the market does not react.

There is research that had been conducted regarding abnormal returns and stock splits but has inconsistent results, including research conducted by Tanoy (2020); Zakiyah & Nurweni (2020); My, Syarif & Yusuf (2022) showing that there is a significant dissimilarityin abnormal stock returns before and after a stock split. However, the results of research done by Safira & Simon (2016); Satria & Adnan (2018); Amin (2020) state that there is no dissimilarityin abnormal returns before and after a stock split. Hence, it could be concluded that whereas some research results in line with the Theory of Stock Splits, there are research results that contradict the Trading Range Theory illustrates that with a stock split, trading volume will increase because share prices are more attractive to investors.

2. Literature Review

2.1. Stock Split

Stock split can be illustrated as a corporate activity to separate the nominal value of share prices according to a certain ratio to increase share liquidity (Yustisia, 2018). The stock split action has two theories which are the basic drivers and with these theories the company can predict the impact of the stock split, namely:

1) Trading Range Theory
   According to trading range theory, too much increase in share price value results in trading becoming less active. Worlu & Omodero (2017) show that carrying out a stock split has the effect of not increasing the share price so that it can be acquired by investors and ultimately increases share liquidity. Stock splits carried out by companies are driven by this trading range theory.
2) Signaling Theory
   Signaling theory is a signal given by company management to investors as an indication of the company's prospects (Brigham & Houston, 2016: 184). According to signaling theory, a stock split provides information regarding significant future profit growth to investors. Companies are given encouragement in signaling theory to carry out stock splits since it will create investment opportunities and the company's increasing future good progress possibilities.

2.2. Stock Trading Volume

Stock price is a matter to be considerate by investors in deciding whether they want to invest in certain stocks.A high share price indicates that many investors are interested in buying these shares. However, if share prices increase too much, it will reduce the capability of investors to be interested in buying shares, especially for those who have limited funds (Tanoy, 2020). Therefore, companies need to carry out stock splits so that shares can be maintained at a certain price range that investors can afford. The existence of a stock split allows demand for shares to increase which causes an increase in share trading volume, where the indicator used is share trading volume which affects share liquidity. Research conducted by Safira & Simon (2016); Luh & Yasa (2019); Tanoy (2020); Irvangi & Rahmani (2022) summarized that before and after the stock split there was TVA dissimilarity.Therefore, the following hypothesis is formulated:

H_1: There is a significant dissimilarityin TVA before and after the stock split

2.3. Bid-Ask Spread

The bid-ask spread represents the difference between the lowest selling price offered by a share seller and the highest share purchase price offered by a share buyer (Kurniawan, Sisdianto & Mustofa, 2022). Stock liquidity is observed based on the bid-ask spread, as if the bid-ask spread of a stock is low means the stock is actively trading (Le & Gregoriou, 2020). It indicates that the shares are more liquid. Research conducted by Zakiyah & Nurweni (2018); Luh & Yasa (2019); Irvangi & Rahmani (2022) summarized that before and after the stock split there was a dissimilarity in the bid-ask spread.Therefore, the following hypothesis is formulated:

H_2: There is a significant dissimilarity in the bid-ask spread before and after the stock split

2.4. Abnormal Return

Abnormal returns occur due to new events that change the value of the company, where investors' reactions to these events are characterized by decreasing or increasing share prices (Amin, 2020). Stock split information that gives a positive signal will provide stability and even growth in stock prices and growth in returns expected by investors. Therefore, a stock split could be considered having information, but not if the market does not act. Research conducted by Tanoy (2020); Zakiyah & Nurweni (2020); My, Syarif, & Yusuf (2022) summarized that before and after the stock split there was a dissimilarity in the abnormal returns.Therefore, the following hypothesis is formulated:

H_3: There is a significant dissimilarity in abnormal returns before and after a stock split

3. Research Methodology

Quantitative research based on the event study method is used in this research to examine the market response to a published event. The population of this research is all companies registered on the IDX that carried out stock splits in 2018-2022, totaling 42 companies. The sample for this research consisted of 36 companies selected using a purposive sampling technique with several sampling criteria, namely companies listed on the IDX during 2018-2022; companies that only carry out stock splits and during the specified window period do not carry out other corporate activities because there are no disruptive events that could affect the research variables; and companies that have completed stock overview data during the research period.

Stock split is applied as an independent variable in this research. If the price of a share is too high, investors' interest in buying shares will decrease. Therefore, stock split activities are carried out when the company considers its share price to be too high. Meanwhile, TVA, abnormal returns, and bid-ask spread are applied as dependent variables.

Trading volume is interpreted as the level of shares traded at prices determined by companies and investors, where the capital market is used as an intermediary (Izza, 2016). Stock trading volume is calculated by applying the stock trading volume stages before and after the stock split calculation as follows:

a) Calculation of trading volume before and after the stock split for each company by applying the TVA formula is as follows:

$$TVA = \frac{\sum Shares\ are\ traded\ at\ time\ t}{\sum stock\ i\ is\ outstanding\ at\ time\ t}$$

b) Calculation of the average trading volume of each company's shares before and after the stock split is using the following formula:

$$ATVA = \frac{\sum TVA}{t}$$

c) Calculation of the difference from the average volume of stock trading before and after the stock split is using the following formula:

$$d = ATVA_{before} - ATVA_{after}$$

The bid-ask spread is calculated using the formula for calculating the bid-ask spread around the day the stock split occurs, which is as follows:

a) Calculation of each company's bid-ask spread before and after the stock split using the TVA formula is as follows:

$$Spread_{i.T} = \frac{(ask_{i.m} - bid_{i.n})}{(ask_{i.m} - bid_{i.n})/2} \times 100\%$$

b) Calculation of the average bid-ask spread for each company before and after the stock split is using the following formula:

$$ABAS = \frac{\sum BAS}{t}$$

c) Calculation of the difference of the bid-ask spread before and after the stock split is using the following formula:

$$d = ABAS_{before} - ABAS_{after}$$

Abnormal returns in this study are calculated using five stages of abnormal returns before and after calculating the stock split as follows:

a) Calculation of stock returns for each company ($R_{i.t}$)

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

b) Calculation of market returns / ICI ($R_{m.t}$)

$$\mathrm{R}_{m.t} = \frac{(\mathrm{ICI}_t - \mathrm{ICI}_{t-1})}{\mathrm{ICI}_{t-1}}$$

c) Calculation of the expected return around the day of the stock split. The market model is used to calculate the expected return with the following formula:

$$E(\mathrm{R_{i,t}}) = \alpha_\mathrm{i} + \beta_\mathrm{i} \cdot R_{m.t} + \varepsilon_\mathrm{i,t}$$

d) Calculation of abnormal returns around the day of stock split is using the following formula:

$$\mathrm{AR}_{i.t} = R_{i.t} - R_{m.t}$$

e) Calculation of the average abnormal return / average abnormal return *(*AAR)

$$\mathrm{AAR}_t = \frac{\sum_{i=1}^{k} AR_{i.t}}{k}$$

The data that has been collected is studied first using descriptive statistical analysis. The next step is to filter the data that has been processed using the normality test (Shapiro Wilk statistical test) with the IBM SPSS Version 21 application to detect data normality. This needs to be done because the data in this study is a ratio size and the sample in this study is less than 50 samples. The significance level (α) of the normality test used is 5% or 0.05. Next, carry out a hypothesis test.

4. Results and Discussion

4.1. Descriptive Statistics

Descriptive analysis is a form of research data analysis to test the generalization of research results based on one sample of this research. This research uses descriptive analysis to determine the average value of stock trading volume, bid-ask spread and abnormal returns around the day of the stock split. The procedures used are (1) collecting data on companies carrying out stock splits regarding the date of the stock split event, daily stock prices specifically closing prices during the window period and stock split estimation period, composite stock price index for the 2018-2022 observation period, offering prices and daily sales price in the window period, share trading volume and number of shares outstanding, (2) determine the average value of share trading volume, bid-ask spread and abnormal return around the day of the stock split, namely 5 days before and 5 days after stock split implementation, and (3) determine the average difference in stock trading volume, bid-ask spread and

abnormal return around the day of the stock split, namely 5 days before and 5 days after the stock split.

Table 1. Descriptive Statistics of Average Stock Trading Volume, Bid-Ask Spread, and Abnormal Return Before and After Stock Split

Variable		N	Minimum	Maximum	Mean	Std. Deviation
Stock Trading Volume	**ATVA before**	36	0.000004	0.037990	0.003342	0.006659
	ATVA after	36	0.000004	0.027600	0.002961	0.004993
Bid-Ask Spread	**ABAS before**	36	-0.081080	0.215336	0.0078415	0.043291
	ABAS after	36	0.000339	0.204468	0.0169095	0.048732
Abnormal Return	**AAR before**	36	-0.051803	0.112592	0.008233	0.026313
	AAR after	36	-0.204928	0.090106	-0.004560	0.041241

Source: Data processed, 2023

The descriptive statistical results of the average TVA, bid-ask spread and abnormal returns before and after the stock split show that the average TVA, bid-ask spread and abnormal return variables are lower than the standard deviation as presented in Table 1.

4.2. Normality Test

The normality test is a basic assumption test used to determine whether the population or sample used in research is normally distributed or not. If the data is normally distributed then the data is tested using parametric statistics. However, if the data is not normally distributed then the data will be tested using non-parametric statistical testing. This research uses a normality test in the form of the Shapiro Wilk statistical test.

Table 2.Normality Test of Average Trading Volume, Bid-Ask Spread, and Abnormal Returns Before and After Stock Split

Variable		Sahpiro-Wilk		
		Statistic	Df	Sig
Stock Trading Volume	ATVA before	0.409	36	0.000
	ATVA after	0.574	36	0.000
Bid-Ask Spread	ABAS before	0.499	36	0.000
	ABAS after	0.355	36	0.000
Abnormal Return	AAR before	0.831	36	0.000
	AAR after	0.639	36	0.000

Source: Data processed, 2023

The results of the significance of the Shapiro-Wilk test as represented in Table 2 show that if the average data on TVA, bid-ask spread and abnormal returns is smaller than the significant value, the data is not normally distributed.

4.3. Hypothesis Testing

Hypothesis testing is testing carried out on a hypothesis with the aim of deciding to accept or reject the hypothesis based on the results of data analysis. This research uses hypothesis testing to determine

whether or not there are differences in stock trading volume, bid-ask spread, and abnormal returns around the day of the stock split. This research uses hypothesis testing in the form of a non-parametric test with the Wilcoxon signed ranks test method because the data is not normally distributed.

Table 3. Wilcoxon Signed Test of Average Rank of TVA, Bid-Ask Spread, and Abnormal Return Before and After Stock Split

		ATVA after-ATVA before
Stock Trading Volume	Z	-0.723
	Asymp. Sig (2-tailed)	0.470
		ABAS after-ABAS before
Bid-Ask Spread	Z	-1.273
	Asymp. Sig (2-tailed)	0.203
		AAR after-AAR before
	Z	-2.090
Abnormal Return	Asymp. Sig (2-tailed)	0.037

Source: Data processed, 2023

Table 3 interprets the average stock trading volume test by applying the Wilcoxon sign rank test, showing a significance value of 0.470. Therefore, it is interpreted that before and after the stock split there was no dissimilarity in trading volume. However, the decrease in the average share trading volume that occurred after the stock split was not much different from the average share trading volume before the stock split. Furthermore, testing the average bid-ask spread shows a significance value of 0.203. Therefore, it is interpreted that before and after the stock split there is no dissimilarity in the bid-ask spread. Testing the average abnormal return shows a significance value of 0.037. Therefore, it is interpreted that before and after the stock split there is a dissimilarity in abnormal returns.

4.4. Discussion

The results of hypothesis 1 research interpret that before and after the stock split there was no dissimilarity in TVA. This theory is not in line with the results of this study, as after the stock split, the stock trading volume did not increase significantly. Investors consider greater risks when transacting in a stock during a pandemic. In addition, the decline in the value of TVA can be affected by the attractiveness of a share itself, even though it has been given a lower price for the stock. A more affordable stock price after a stock split will not always result in a multifold increase in investor transactions for a stock, taking into consideration the company's performance and the actual return which is lower than the expected return. This research provides results that are in accordance with the results of previous research written by Amin (2020); Zakiyah & Nurweni (2020) stated that before and after the stock split there was no TVA dissimilarity.

The results of hypothesis 2 interpret that before and after the stock split there is no dissimilarity in the bid-ask spread.The smaller the bid-ask spread, the greater the possibility of reaching the transaction price, making shares easier to trade, which indicates that a stock is more liquid (Le & Gregoriou, 2020). The results of this study, however, show that the average bid-ask spread has increased. Inventory holding cost increased due to the decrease in the average volume of stock trading, meaning that not many investors bought a stock or only kept their shares, thus losing the opportunity to get capital gains. This research provides results that are in accordance with the results of previous research written by Safira & Simon (2016); Hagstromer (2021) stated that after the stock split there was no dissimilarity in the bid-ask spread.

The research results for hypothesis 3 interpret that before and after the stock split there isdissimilarity in the abnormal returns.Stock split information was responded to by the market with an increase in stock prices which had an impact on the occurrence of abnormal returns before and after the stock split. Abnormal return before the stock split showed a positive value compared to after the stock split announcement, which shows a negative value. This shows that investors reacted before the stock split,butwere less interested when the shares had been split. This research provides results that are in accordance with the results of previous research written byTanoy (2020); Zakiyah & Nurweni (2020); My, Syarif & Yusuf (2022), which stated that before and after the stock split there was dissimilarity in the abnormal returns.

5. Conclusion

Based on the test results, it can be concluded that on the day the stock split occurred there was a significant abnormal return dissimilarity. However, on the day of the stock split there were no significant differences in stock trading volume and bid-ask spread.Investors are advised to choose a company to invest in, taking into account various considerations based on company performance, stock prospects, and market conditions at the time of the stock split. Whereas for companies, it is better if they make a decision to carry out a stock split, it must consider the behavior of investors believing that the decision will be met with a positive response. This positive response shows that there is a positive signal perceived by investors that the company will be in good condition in the future.For future researchers, it is hoped that research related to stock splits can add other dependent variables that can affect stock splits, by increasing the sample size or conducting research related to stock splits in accordance with the company's business sector and the observation period, in order to provide better results.

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