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MARKET REACTION TO THE INCRAESE IN FUEL OIL (BBM) PRICES IN 2022: EMPIRICAL STUDY ON MANUFACTURING COMPANIES LISTED ON THE INDONESIAN STOCK EXCHANGE (BEI)

[1]Nanda, [2]Heriyadi, [3] Wendy, [4]Mustarudin, [5]Mazayatul Mufrihah
[1,2,3,4,5]Faculty Of Economics And Business, Universitas Tanjungpura, Indonesia

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ABSTRACT

The main goal of this research is to assess the influence of the 2022 rise in fuel oil (BBM) prices on the manufacturing companies listed on the Indonesia Stock Exchange (IDX). This research methodology consists of a Mann- Whitney U-Test and an event study. The selection for this study consists of manufacturing companies that are publicly listed on the Indonesia Stock Exchange (IDX). The research incorporates the following variables: trading volume activity (TVA), abnormal return, stock price, and stock trading frequency. The observation period is comprised of the time between the event period and the estimation period. The event period encompasses the five days preceding, one day during, and five days following the BBM fee increase. The Market Model uses the estimation period to calculate the expected return. The results of this research indicate a statistically significant variation in the abnormal return; however, no such distinctions are observed in the stock price, TVA, or stock frequency.

E-mail:
nandastiadi@gmail.com

1. INTRODUCTION

Oil fuel (BBM) is an essential commodity for economic activity as a material that supports production processes for industries that ultimately drive the economy. The direct impact that will be felt when the cost of petroleum (BBM) rises is the changes in operating costs that increase to increase the overall cost and result in an increase in the prices of commodities of production, which then affects a decrease in the rate of profits of companies especially in companies that operate in the field of manufacturing. In the economy, the activity of one sector will necessarily affect another sector, so any policy directly related to one industry of the economy will affect the other sector. In addition, the multiple effects of the rise in the price of oil fuel (BBM) also affect the prices of the basic needs of the society that are becoming higher, resulting in a decrease in the buying capability of the populace.

With the exception of the presidency of Joko Widodo, the price of fuel (BBM) in Indonesia has fluctuated repeatedly between 2014 and the present. The government raised the prices of two categories of subsidized fuels on November 17, 2014. The cost of diesel escalated from Rp 5,500 per liter to Rp 7,500 per liter, and subsequently, the prices of premium petroleum increased from Rp 6,500 to Rp 8,500 per liter. On January 1, 2015, approximately one and a half months later, the government implemented a price reduction for premium and diesel fuel. Diesel prices fell from Rp 7,600 to Rp 7,250 per liter, while premium prices fell from Rp 8,500 to Rp 7,600 per liter. Nonetheless, on January 19, 2015, the government reduced premium and diesel prices once more. The initial premium price of Rp 7,600 per liter was reduced to Rp 6,600. Diesel was subsequently priced at Rp 6,400 per liter, down from Rp 7,250 initially. However, those figures were short-lived. The government declared a Rp 200 increase in the premium price, bringing the total to Rp 6,800 per liter, effective March 1, 2015. The government increased premium and diesel prices by Rp 500 per liter on March 28, 2015. The cost of premium fuel saw a rise from Rp 6,800 to Rp 7,300 per liter, whereas the price of diesel increased from Rp 6,400 to Rp 6,900 per liter. The cost of these two fuel varieties was diminished by the conclusion of 2015. Diesel decreased in price from Rp 6,700 to Rp 5,950 per liter, whereas the luxury price fell from Rp 7,300 to Rp 7,150 per liter. The government reduced the price of premium and diesel fuel once more on January 5. Diesel decreased in price from Rp 6,700 to Rp 5,650 per liter, whereas the luxury price fell from Rp 7,300 to Rp 6,950 per liter. Three months later, on April

1, 2016, premium and diesel prices decreased once more. The premium pricing experienced a reduction from Rp 6,950 to Rp 6,450, while the diesel price per liter decreased from Rp 5,650 to Rp 5,150. In 2018, there were two increases in the price of pertalite. The government increased the cost of pertalite to Rp 7,600 per liter on January 20, 2018. The price of pertalite increased once more on March 24, 2018, to Rp 7,800 per liter. The government reduced the price of pertalite to Rp 7,650 per liter on January 5, 2019. The government implemented a substantial price increase of Rp 3,000 on April 1, 2022, increasing the cost of non-subsidized petroleum, pertamax starting at Rp 9,000 to Rp 12,500-13,000 per liter. In the most recent development, which occurred on September 3, 2022, the government implemented a price increase for pertamax, diesel, and pertalite. The cost of pertamax increased from Rp 12,500 to Rp 14,500 per liter, diesel went up from Rp 5,150 to Rp 6,800 per liter, and pertalite saw a rise from Rp 7,650 to Rp 10,000 per liter [1].

A capital market investor reaction will be precipitated by the decision by the government to raise the cost of BBM. Investors must have access to fundamental information in order to make sound investment decisions [2]. Stock price fluctuations and trading volumes on the stock exchange have been impacted by BBM tariff increases mandated by the government, as indicated by this information. While the increase in BBM prices is not directly influenced by capital market dynamics, it is inextricably linked to stock exchange activity due to the stock market's greater significance in economic activity, which renders it more susceptible to a variety of external events, whether or not they are directly associated with economic matters. A surge in the price of BBMs may impact investors' investment choices when engaging in the buying and selling of stocks on the capital market; consequently, the investor's disposition or conduct regarding the purchase and sale of stocks on the capital market may be influenced, potentially instigating a market reaction. When information affecting market participants (including investors and corporations) is disseminated to the general public, it subsequently exerts an impact on trading activities within the capital market. The information reaches market participants, specifically investors, who subsequently observe stock price fluctuations, which reflect this effect.

This research is conducted to determine the reaction or response and behavior of capital market participants to an economic event. The economic events referred to here are the rise in the price of oil fuel (BBM) and its impact on the overall investment climate in Indonesia. Knowing the behavior of the capital market players will be able to predict the response and reaction of the market to an economic and business event in the future.

Literature Review

Stock Price

The price of the stock when it is traded on the capital market [3]. Since the stock price indicates the performance of the issuer, then investors will pay attention to the stock's price when investing [4]. The stock price can change at any time, from annual, monthly, weekly to daily. Many factors influence the stock price change, one of the most influential factors on the stock price is the amount of demand and supply on the stock exchange [5]. Transactions on the capital market, which are influenced by the demand and supply of the stock in question, will determine the price of the stock.

Stock price fluctuations may be influenced by both internal and external factors. Profits, annual asset growth, liquidity, total wealth value, and sales are all internal factors. Government policies and their effects, including interest rate fluctuations, currency exchange rate volatility, market speculation and sentiment, and mergers, are examples of external factors [6].

The price of the stock can be divided into two components, the primary stock price and the secondary market price. The difference between the prices of the two stores is that the first stock has a fixed price and has been previously fixed and offered to the public for the first time. The stock price on the secondary market does not have a static price but can fluctuate according to the current market situation. A publishing company that can generate high profits is able to allocate a significant portion of those profits as dividends. A high dividend will attract investors' interest in buying the shares. This leads to a rise in demand for the stock concerned, ultimately driving up the stock price.

Abnormal Return

Share returns are the profits shareholders generate from their investments [7]. Abnormal return is the difference between actual return and expected returns [8]. Actual return is a return that has occurred and is measured as a measure of the company's performance and can be calculated from historical data [9]. At the same time, the expected return is the return the investor expects in the future [10]. Abnormal return has two types of return: positive and negative. Abnormal positive returns can

occur when actual returns are greater than expected, and abnormal negative returns occur when actual returns are smaller than expected [11].

An event that gives an Abnormal Return (AR) reflects that an event contains information. On the contrary, events that do not collect information do not provide investors an Abnormal Return (AR). Utilize the following formula to determine the anomalous return of the stock (i) on day (t) [12].

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

Description:

AR_{it} = abnormal return of stock (i) on day (t)

R_{it} = actual return for stock (i) on day (t)

$E(R_{it})$ = expected return for stock (i) on day (t)

The actual return is the return that occurs at the period t which is the difference of the current price relative to the previous price. The formula is as follows (Hartono, 2022).

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$$

Description:

R_{it} = actual return of shares (i) on day (t)

P_{it} = closing price of stock (i) on day (t)

P_{it-1} = closing price of stock (i) on day (t-1)

Trading Volume Activity

Trading volume activity (TVA) is a parameter that compares the amount of stocks transacted in allocated time with the total supply in circulation at that time. Total shares in circulation comprise all shares issued by the company at the time of the issuance of the shares. The formula used to calculate Trading volume activity (TVA) is as follows [12].

$$TVA_{it} = \frac{\sum_i^t stock\ traded}{\sum_i^t shares\ outstanding}$$

Increased trading volume refers to increased trading activity by investors on the stock exchange. The higher the stock demand and supply, the greater its influence on stock price fluctuations. If the volume of stock trading increases, this indicates a higher level of public interest in the stock, which in turn affects the price or return of the stock [13].

Trading Volume Activity (TVA) can be used as a tool to measure capital market reaction to information based on trading volume movement parameters in the stock market [14]. Trading Volume Activity (TVA) analysis is performed to see the capital market reaction through the movement of trading volume activity in the market and to obtain a more comprehensive picture of the market response [15]. The TVA approach also tests efficient market hypotheses in weak forms. This methodology is applicable in markets that have not achieved full efficiency or are characterized by weak efficiency, making it impractical to rely on historical data for predicting current prices. Investors are unable to leverage historical information for identifying abnormal returns. Consequently, the observation of capital market reactions is limited to the dynamics of trading volume within the specified stock market.

There are several principles in the interpretation of trading volumes, which are as follows:

1) Trade volume follows the prevailing trend, with an uptrend in the market resulting in increased trading activity. Conversely, a downtrend in the market leads to a decrease in trading activity. This implies that trading volume can serve as an indicator for anticipating present market trends.
2) The actions of participants in the capital market significantly impact stock prices. For instance, in response to unfavorable news, if a seller decides to sell their stocks, it will result in a decline in the stock price.
3) Increased prices combined with a reduction in trading volumes indicate unusual conditions, pointing to a weakening trend that is poised for a change. Such patterns are indicative of a bearish trend and should be taken into consideration. In markets exhibiting an upward trend with limited trading volumes, this may be attributed to a shortage of sellers compared to the enthusiasm of buyers. In due course, this is expected to propel the market to a price level where sellers become more inclined to sell their stocks.

Information about the trading volume of stocks is important information for investors, because it

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describes the effects traded on the capital market. The stock trading volume is also used to see the market reaction to information by observing changes in trading volumes in capital markets [13]. High trading volumes will increase the liquidity of stocks and can be an indication that the market will be improving, while giving an indirect effect to the company that the trading volume can reflect the good or badness of the stocks.

Stock Trading Frequency

The trading frequency is how many times a buy-and-buy transaction occurs on the stock concerned at a given time [16]. The frequency of stock trading is the number of shares a company sells and buys in a given period [17]. The frequency of stock trading can be calculated by dividing the amount of stock transactions by the number of days the stock is sold for sale. The frequency of stock trading has a strong influence on the number of shares in circulation; if the frequencies of trading are significant then the stakes are declared to be in demand by market participants [18].

Conceptual framework

Based on the background description and the literature review above, a picture of the conceptual framework of this research is as follows.

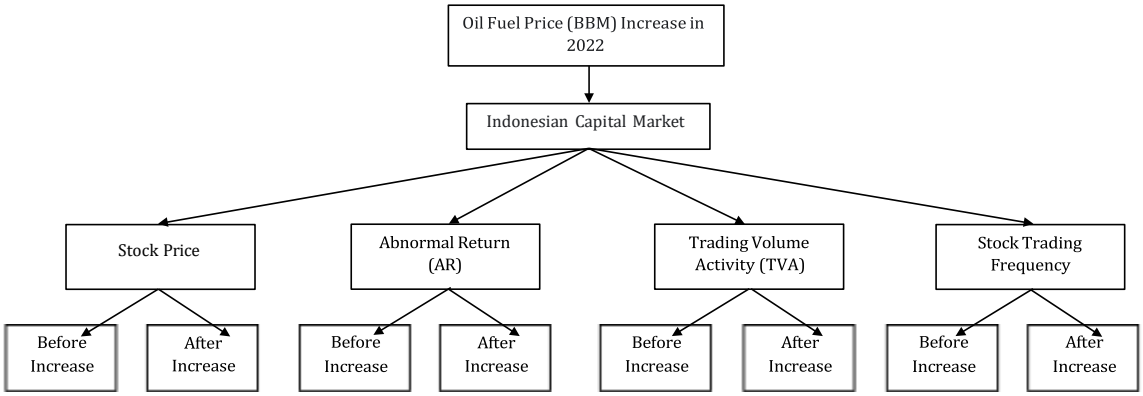

Figure 1. Research Framework

Relationship of Stock Price and Market Reaction

The stock price is the stock value determined by the power of the offer to buy the stock on a particular market mechanism and is also the sale price of one investor to another investor [19]. Therefore, stock prices are formed by the forces of demand and supply for the shares. If the amount of stock demand rises while the stock supply is assumed to be fixed, the stock price will increase. The stock price on the capital market can change at any time. In addition to being influenced by the quantity of demand and supply, the stock price is also affected by information that can cause stock price changes. The movement of stock prices can reflect the reaction of the capital market when there is an announcement of an increase in fuel prices [20]. Moreover, capital market reactions to oil fuel (BBM) price changes have significant effects both in the long term and in the short term [21].

Based on the description of the relationship between stock price movements and stock investment as presented above, the first hypothesis in this study can be formulated as follows:

H1: There is a significant difference between stock prices before and after the announcement of an increase in fuel prices (BBM)

Relationship of Abnormal Return and Market Reaction

Abnormal return is the advantage of the actual return over the investor's expected return. A positive variance in returns arises when the actual return exceeds the anticipated or calculated return.The return is negative if the return obtained is smaller than the expected or estimated return [22]. Abnormal Return (AR) can reflect the capital market's reaction when there is an announcement of an increase in fuel prices [23].

Based on the description of the relationship between abnormal return and stock investment as presented above, the second hypothesis in this study can be formulated as follows:

H2: There is a significant difference between Abnormal Return (AR) before and after the announcement of an increase in fuel prices (BBM).

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Relationship of Trading Volume Activity and Market Reaction

The share sales volume is the ratio between the total of stock sheets traded at assigned time and the amount of stocks circulating at a particular time [24]. The share sales volume is a measure of the size of the stock traded, indicating the ease of trading the stock. The size of sales volumes can be determined by observing stock trading activity that can be seen through the Trading Volume Activity (TVA) indicator [25]. The performance of a stock can be measured by its sales volume. The sales volume of the stock can reflect the reaction of the capital market at the time of the announcement of an event or information [7].

Based on the description of the relationship between the volume of stock sales and stock investment as presented above, the third hypothesis in this study can be formulated as follows:
H3: There is a significant difference in Trading Volume Activity (TVA) before and after the announcemen t of the increase in the price of fuel (BBM)

Relationship of Stock Trading Frequency and Market Reaction

The frequency of stock trading describes how many times an issuer's stock is traded in a given period. An increase in the frequency of trading transactions, usually caused by high demand, will indicate a positive market reaction. The frequency of stock trading is positively related to the number of shareholders, meaning that the trading frequencies describe the active absence of the stock in the marke t trading [18]. The frequency of stock trading activity in the capital markets is an essential indication for studying market behavior as a reference in looking at market reactions. The stock trading frequency can reflect the capital market's reaction during the announcement of fuel price increases [20].

Based on the description of the relationship between the frequency of stock trading and stock investment as presented above, the fourth hypothesis in this study can be formulated as follows:
H4: There is a significant difference in the stock trading frequency before and after the announcement of the increase in the price of Fuel (BBM)

2. METHOD

The type of research used in this study is an event study. An event study is a study that studies the reaction of the market to an event whose information is published as an announcement [26]. Event studies are used to investigate market responses to the information content of a statement or publication of a particular event. If the announcement contains information, the market will react at the time of the increase in the price of oil fuels (BBM).

This research uses secondary data on the Indonesian Stock Exchange (BEI) and the website finance.yahoo.com. Secondary data is obtained by reading, learning, and understanding through other media sources from literature, books, and corporate documents [27].The secondary data used in this study is based on historical stock price data, the number of stock transactions, the number of shares traded, and the amount in circulation of the shares of manufacturing companies listed on the Indonesian Stock Exchange (EIB) as well as historical data of the Combined Stock Price Index.

The population in this study is the entire manufacturing sector companies listed on the Indonesian Stock Exchange, as many as 274 companies. The sampling method used in this study is purposive samplings with the criteria: Companies belonging to the non-cyclical consumer sector, companies listing before September 2022, and companies belonging to the main listing board. Table 1 presents the stages of the sample selection of the research.

Table 1. Sample Selection Stage

No	Sample withdrawal criteria	Quantity
1	Consumer sector companies listed on the Indonesian Stock Exchange (IDX)	274
2	Companies sector consumer noncyclicals	(151)
3	Company listing before September 2022	(12)
4	Companies belong to the main listing board	(54)
	Research Samples	**57**

The study used the normality test of the Kolmogorov-Smirnov (K-S) statistical test data to determine whether the research data were distributed normally or not. This study uses the non-parametric statistical test method of the Mann-Whitney U-test [28]. The research hypothesis is accepted if the Asymp. Sig. value is < 0.05, whereas if the Asymp. Sig. value is > 0.05, the research hypothesis is rejected. If the data does not show significance at a 5% significance level, a 10% significance level can be used. Thus, the research hypothesis is accepted if the Asymp. Sig. value is < 0.10, whereas if the Asymp. Sig. value is > 0.10; the research hypothesis is rejected.

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3. RESULT AND DISCUSSION

Data Normality

Before testing the hypothesis, a test of data normality is conducted. This normality test is performed to determine which statistical test method will be used to test the research hypothesis. The normality test used in this study is the Kolmogorov-Smirnov test. The research data must be tested first to determine whether the data is normally distributed or not. Research data is normally distributed if the p-value is > 0.05, while if the p-value is < 0.05, then the research data is not normally distributed. The following are the results of the normality test for the data in this study.

Table 2. Data Normality Test Results

No	Variable	Asymp. Sig. (2-tailed)
1	Stock Price	0.000
2	Abnormal Return (AR)	0.000
3	Trading Volume Activity (TVA) Stock	0.000
4	Trading Frequency	0.000

Based on the above table, the normality test results of the data of the four variables (stock price, Abnormal Return (AR), Trading Volume Activity (TVA), and stock frequency) each have an Asymp. Sig value of 0,000, where the figure has a p-value < 0.05, so it can be concluded that the research data is not distributed normally.

Research Hypothesis Test

After the normality test of the data of the four research variables (stock price, Abnormal Return (AR), Trading Volume Activity (TVA), and frequency of the stock) and the results of the normality test, the data showed the research data not distributed normally, then to test the research hypothesis can use non-parametric statistical test. Here are the results of testing the idea using the Mann-Whitney U-test.

Table 3. Result of the Hypothesis Test Mann-Whitney U-Test

	Stock Price	Abnormal Return (AR)	Trading Volume Activity (TVA)	Stock Trading Frequency
Mann-Whitney U	40207.500	36867.000	40599.500	40430.000
Wilcoxon W	80962.500	77622.000	81354.500	81185.000
Z	-.206	-1.905	-.007	-.093
Asymp. Sig. (2-tailed)	.837	.057	.995	.926

The stock price used is the closing price of the stock for 5 days before the announcement of the increase in the price of Oil Fuel (BBM) and the closure price of 5 days after announcing the rise in the prices of Oil Fuel (BBM). Table 3 shows that the Mann-Whitney U-Test test on the stock price before and after the announcement of the increase in the Oil Fuel Price (BBM) yielded an Asymp. Sig. value of 0.837, the value greater than either 0.05 or 0.10, so the first hypothesis (H1) was rejected. This indicates that there is an insignificant distinction in stock prices before and after the announcement of the fuel oil price hike (BBM).

The second hypothesis in this study is that there is a significant difference in Abnormal Return (AR) before and after the announcement of oil fuel price increases (BBM). The first step to obtain the value of Abnormal Return (AR) is to calculate the individual return of 57 companies, the second step is to compute the market return (Rmt) based on IHSG, the third is to degrade the daily return of individual stocks with the daily market return to acquire the values α and β of each stock using a single index model, the fourth step is the calculation of the expected return by summing up values a and β and then multiplying the return value of the market, and the last step is calculating the abnormal return (AR). The calculation of abnormal returns in this study took two time periods, 60 days of the estimate period and 11 days of the event period.

The results of the Mann-Whitney U-Test in table 3 showed Abnormal Return (AR) before and after the announcement of the increase in the fuel price (BBM), resulted in an Asymp. Sig. value of 0.057 < 0.10, then it can be concluded that the second hypothesis (H2) was accepted at a significance rate of 10%. The third hypothesis in this study is that there are significant differences in the Trading Volume Activity (TVA) before and after the announcement of the increase in fuel oil prices (BBM). Table 3 shows that the Mann-Whitney U-Test test on Trading Volume Activity (TVA) prior to and after announcing the rise in the

fuel oil price (BBM) yields an Asymp value. Sig. of 0.995, the value is greater than either 0.05 or 0.10 so it can be concluded that the third Hypothesis (H3) is rejected.

The fourth hypothesis of this study is that there is a significant difference in stock frequency before and after the announcement of oil fuel price increases (BBM). The calculation of the stock frequency used in this study is the frequencies of stocks during the 5 days prior to the announcement of the increase in the price of Petroleum Fuel (BBM) and stocks 5 days after the announcing of the price increase of petroleum fuel (BBM). Table 3 shows that the Mann-Whitney U-Test test on stock frequency before and after the announcement of the oil fuel price hike (BBM) yielded an Asymp. Sig. value of 0.926, greater than 0.05 or 0.10, so the fourth hypothesis (H4) was rejected. That means there is no significant difference between the stock frequency before and after the announcement of the oil fuel (BBM) price increase on September 3, 2022.

The results of this study show that there are no significant differences in the price of stocks, The results this study showed that there were no significant differences in the stock price, Trading Volume Activity (TVA), or stock frequency at the time after the oil fuel price increase was announced. This indicates that capital market players who engage in stock trading or investment activities do not give excessive reactions in the face of BBM price increases. This could happen because information about the BBM price increase was first circulated before the announcement. Although the BBM price has experienced a fairly significant rise, as shown in Table 4, investors have not reacted or responded to the news because they were aware of the information of this BBM rise before the day of the announceme nt. This can be seen from the stock demand, and supply remained stable as usual, so Trading Volume Activity (VAT) and stock frequency had no significant differences before or after the announcement of oil fuel price increases.

Table 4. BBM Price Rise Percentage

BBM Type	Initial Price	Price After Increase	Percentage Increase
Pertalite	Rp 7.650 per liter Rp	Rp 10.000 per liter	30.72%
Subsidized diesel	5.150 per liter	Rp 6.800 per liter	32.04%
Pertamax	Rp 12.500 per liter	Rp 14.500 per liter	16%

The results of this study are consistent with the theory of Semi-Strong Form Market Efficiency. There are three forms of market efficiency. The first is weak form market efficiency, a condition where stock prices reflect all historical information. In this situation, investors cannot achieve returns above normal returns by using past stock price patterns. The second is semi-strong form market efficiency, where stock prices reflect past prices and all available information. Therefore, investors cannot consistently generate profits using this information, as everyone has equal access to the information. The third is strong form market efficiency, a condition where stock prices reflect all publicly available information and private information such as company fundamentals and other economic factors [29].

4. CONCLUSION

The study observes the market reaction to the announcement of the oil fuel price hike, which was announced on September 3, 2022. The market reaction was measured based on stock price differences, abnormal returns, trading volume activity, and stock trading frequency before and after the announcement of the BBM increase. The hypothesis test results showed an abnormal difference in return before and after the announcement of the BBM increase. Another finding in the study was that there were no significant changes before or after the announcement of BBM price increases in the stock price, trading volume activity, and frequency of stock trading. This was due to rumors that had been circulating about BBM price increases before the government announced the BBM increase. So investors responded to the news long before it happened. Besides, this study only observes one business sector to see market reactions in general. Further researchers can further refine the limitations of this research by observing more than one business sector. Additional researchers can also use other events that can trigger reactions from capital market players, such as changes in government policy, global economic factors, and other important news such as dividend distribution, stock split, and so on.

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