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The Influence of Oil Price Volatility and Price Limit in Indonesia Energy Sub-sector for the Period before and After Covid-19

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ABSTRACT

This study aims to analyze the determinants of the influence of oil price volatility and price limits on Energy sub-sector companies listed on the Indonesia Stock Exchange in 2018-2021 before and after Covid-19. This study uses the Eviews 10 program as information preparation and the results of irregular influence are selected to see the relationship between the dependent and independent variables which calculates oil price volatility (WTI), price limit (PL), return on assets (ROA), earnings per share (EPS), and exchange rate (FOREX). The result is that the current proportion, the ratio of Return on Resources (ROA), and Trade Rate (FOREX) do not affect stock returns. Price limit (PL), Earning Per Share (EPS), and World Oil Cost (WTI) affect the return of shares of energy sub-sector companies, namely oil and coal which are listed on the Indonesia Stock Exchange in 2018-2021 period before and after Covid-19.

Keywords: Oil Price, Price Limit, Probability, Forex, Covid-19

JEL Classifications: E22, E44, G11, O42, Q47

1. INTRODUCTION

During the Covid-19 pandemic, the record for the energy sub-sector segment again showed a value of 2.07% and became one of the columns that became part of the growth of the Jakarta Composite File (IHSG). Depreciation of share payments in the energy sub-sector segment cannot be separated from the difference in depreciation of oil and coal prices throughout 2021 during the current pandemic. Usually due to the abundant supplies of oil and coal that are accessible on the global market. Not only that, if it is seen from existing sources it can be explained that with the reference price of oil which is very abundantly used in the world, to be precise west texas intermediate (WTI) in December 2020 during the Covid-19 pandemic, the oil reference price fell by around 29, 8%. The excess supply rate is the main cause, many of the world's oil-producing countries have developed their generation tremendously, such as the Joining Nations, countries such as Russia, and Saudi Arabia, which did not take part in the process after the

request was made. In addition, another factor contributing to the weakening of share prices in the energy subsector was the escalation in the trade war between China and the United States, which caused global financial conditions to slow down, thus disrupting financial developments. In addition, exchange wars also carry the risk of loss, more specifically, when the world economy slows down, causing the existing energy demand to shrink (Tanjung, 2021). who does not take part in the process after the request has occurred? In addition, another factor contributing to the weakening of share prices in the energy subsector was the onset of the trade war between the United States and China, which caused a global financial pause that disrupted financial developments (Wu and Wu, 2017). In addition, exchange wars also carry the risk of loss, especially when the world economy is slowing down causing the existing energy demand to shrink. who does not take part in the process after the request has occurred? In addition, another factor contributing to the weakening of share prices in the energy subsector was the escalating trade war between the United States and China, which caused an international

financial pause that disrupted financial developments. In addition, exchange rate wars also carry the risk of loss, to be more specific when the world economy slows down causing the existing energy demand to shrink.

The have an effect on of the system of reducing the value of shares in the strength sub-sector, inequality of oil and coal yields additionally lowered (Endri et al., 2020). Figure 1 beneath illustrates the incidence of facts related to return to everyday share. Population effects by means of Endri et al. (2019) observed that activities in the return on assets (ROA) activities have an effect on essential events in present activities. This end result eliminates the query of (Endri and Fathony, 2020; Suripto, 2021) which explains that return on assets (ROA) does no longer have a vital impact on stock returns. Search effect through Endri et al. (2019) and (Chen et al., 2005; Lee, 2015) found that fee restriction (PL) affects the daily limit of stock returns. This result contradicts the effect of searching with the help of (Dzyuba and Solovyeva, 2020) and Allozi and Obeidat (2016) who state that the price limit (PL) does not affect the daily limit of inventory returns. (Hongkong, 2017) found that earnings per share (EPS) no longer affect shareholders and stock returns.

This result contradicts the results of (Chen et al., 2005) look-up which states that earnings per share (EPS) affect shareholders in stock return transactions. (Robiyanto, 2018) show that FOREX and west texas intermediate (WTI) has a considerable influence on stock returns. This result contradicts the results of (Chen et al., 2005) look-up which states that earnings per share (EPS) affect shareholders in stock return transactions. (Robiyanto, 2018) show that FOREX and West Texas Intermediate (WTI) has a considerable influence on stock returns. This result contradicts the results of (Chen et al., 2005) lookup which states that earnings per share (EPS) have an impact on shareholders in share return transactions. (Robiyanto, 2018) show that FOREX and west texas intermediate (WTI) has a considerable influence on stock returns.

The COVID-19 pandemic not only affects the health sector, but also erodes the global economy, including Indonesia (Baig et al.,

2021), (Chen et al., 2020), (Just and Echaust, 2020), (Ortmann et al., 2020), (Meher et al., 2020), (Singh and Shukla, 2020).

This has an impact on the change price of the rupiah, as well as the cause of the decline in the Jakarta composite index (IHSG) which ultimately fell (Figure 2). Besides, the entirety is past predictions and hard to control. Prior to the affirmation of the first phase of COVID-19 in Indonesia, the JCI used to be at the degree of 6,249 (25 Jan), down to 5,930 (19 Feb) and 5,343 (2 March). On March 12, when WHO declared COVID-19, a global pandemic, the JCI fell to 4.19% or 4,942 at Wednesday's session, an unheard of stage in 4 long periods. On the different hand, on Walk 13, the stock market stalled for the 1st time since 2008 due to expansion (Planning et al., Nd).

All human activities are not limited solely to curb the spread of the virus. There are various international locations that have adopted partial and simultaneous restrict policies, which have an impact on energy demand.

Countries with full lockdown policies experience lower energy demand than countries with partial locks. Meanwhile, in 2020 it is estimated that there will be a decrease of 5.9% in the previous year. This is considered the worst condition of 71 years after the second world war. Indonesia is one of the countries with a limited restriction policy, which also has an impact on energy demand (Ibrahim et al., 2018).

Internal factors such as price limits (PL), return on assets (ROA), and earnings per share (EPS), while external components such as exchange rates and oil price volatility (Karaev et al., 2020), (Supriyanto et al., 2021).

2. LITERATURE REVIEW

2. 1. Effect of Price Limit on Stock Returns

The price limit seems to be able to reduce the level of volatility of stock returns after a period of reaching the limit, both for stocks that have increased or decreased in price. (Hasanudin et al., 2020) states that price limits play a role in limiting daily stock price movements which are very extreme.

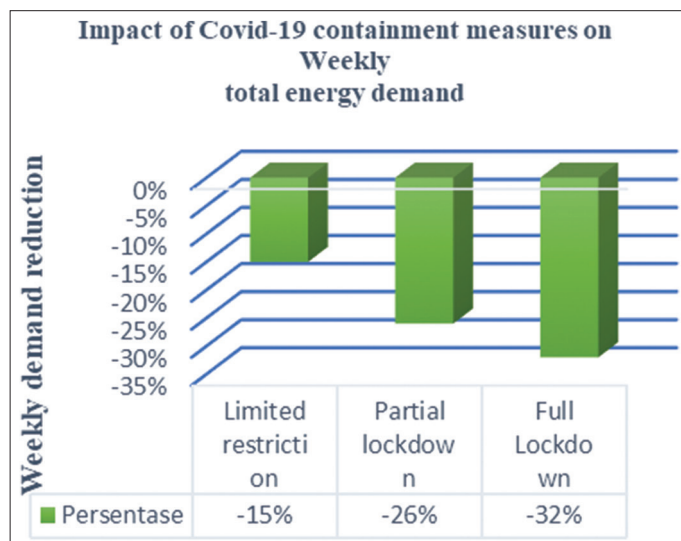
H_1 : Price limit affects stock returns.

2. 2. Effect of Return on Assets on Stock Return Return

The occurrence of Return on Assets led to the emergence of corporate monetary execution in generating net wages from the resources used and processed for company operations. (Endri, 2020) states that the occurrence of Return on Assets has a positive and critical effect on existing stock returns. In other words, the coefficient which is positive means that the more attention is paid to productivity, the higher the stock return. Meanwhile, (Bilal et al., 2021) states that return on asset income does not affect stock returns. This can be seen if the company does not carry out activities that are less effective in utilizing existing resources, profits will be created which are expected to reduce investor interest in buying company shares (Dian S, 2018).

H_2 : Return on assets affects stock returns.

Figure 1: Impact of COVID-19 on world energy demand



2. 3. Effect of Earning Per Share on Stock Return

The increasing value of Earning Per Share shows that the amount of profit distributed to investors is getting bigger so that the increase in EPS will attract investors to buy shares. With this increased demand, the price will increase the company's stock return Midesia et al. (2016), (Nurlaela et al., 2019), (Sugianto et al., 2020). Earning Per Share, companies that get higher Earning Per Share do not consistently have large stock returns. This is because the company's ability to use the assets it uses is less effective, resulting in very low profits. Meanwhile, (Elfiswandi et al., 2020), (Huda et al., 2015) show that Earning Per Share does not affect the return of existing stocks.

H₃: Earning Per Share affects stock returns.

2. 4. The Influence of Forex on Stock Returns

The occurrence of changes in trading prices was originally a reflection of changes in competitiveness between Indonesia and stock exchange partners. In contrast to the research results of (Yeboah and Takacs, 2019) cited that the occurrence of the rupiah alternate charge against the USD had a high quality and indispensable effect on present inventory returns. Meanwhile, the research results of (Maheen, 2013) show that there is no relationship between the trading value and the cost of shares and the two factors generally experience freedom in the occurrence of transactions.

H₄: Forex affects stock returns.

2. 5. Effect of Oil Prices on Stock Returns

The price of WTI oil is a standard measure of oil trade in America (Diaz and de Gracia, 2017) states that the causes of changes in the determination of the cost of oil directly have a positive and critical impact on the return of the initial stock of sub sector energy in the short term and the large level of oil prices has a positive impact on short-term stock returns. In contrast to the stated statements, Masood et al. (2019), Gunarto et al. (2020) argue that the occurrence of oil prices does not have a significant effect on the activities of all original stocks for all G7 countries.

H₅: Oil price affects stock returns.

3. METHODOLOGY AND DATA

The research used is quantitative. The population in this study is the energy sub-sector listed on the Indonesia Stock Exchange (IDX) for the 2018-2021 period before and after Covid-19. Where the determination of sampling using a purposive sampling technique. The test criteria are characterized by three things, namely 1. Oil and coal companies in the energy sub-sector listed on the Indonesia Stock Exchange and were not delisted in the 2018-2021 period before and after the Covid-19 pandemic. 2. Opening an energy sub-sector company that separately distributes total budget reports from 2018 to 2021 before and after Covid-19. 3 Has no exclusion of information from financial statement records. If the company has exemption information, the results will be one-sided.

Based on these criteria, this idea is motivated to analyze the effect of the volatility of PL, ROA, EPS, FOREX, and oil prices on stock

returns in the energy sub-sector. Investigations into the definition of speculation are based on aiding hypotheses and established thru a collection of factual tests. Questions about conclusions are drawn primarily based on the consequences of measured testing. The approach for compiling extra information that has been amassed from various sources is carried out using various computer software, such as Microsoft Exceed Expect 2020 and EViews 10.0. (64 bit). Information handling exercise using the Microsoft Exceed hope 2020 program related to table creation and investigation. Meanwhile, in the information recurrence management board, the author uses the EViews 10.0 (64 bit) computer program.

The research programs used in this thinking are:

$$SR_{it} = \alpha \beta_1 PL_{it} + \beta_2 ROA_{it} + \beta_3 EPS_{it} + \beta_4 FOREX_{it} + \beta_5 WTI_{it} + \epsilon_{it}$$

$$i = 1, 2, \dots, N; t = 1, 2, \dots, T$$

which one:

sr = return of shares, pl = daily price limit, roa = return of resources, eps = earning per share wti = world oil texas file, forex = usd trading rate against dollar ϵ = component error, β = italic, α = caught, i = company, t = year, n = number of perceptions, t = number of times, $n \times t$ = number of board information.

4. RESULTS AND DISCUSSION

4. 1. Data Analysis

Table 1 describes the description of facts that measures investigative occasions about the elements that compute the mean, maximum, extreme, smallest, and widespread deviation values. Where the trendy deviation cost is described as a measure that calculates the method of handing over a series of records relative to the stage of normality, the place the evaluation of every variable is high-quality however has variations that have to be regarded and understood from the outcomes that occur. From this study, the greatest trendy deviation price skilled with the aid of the return on assets (ROA) variable, particularly 22.34593 which suggests that the return on assets (ROA) variable has a greater likelihood stage than different factors. Meanwhile, the percentage of FOREX variables presently has the smallest stage of danger, specifically 0.861410.

The subordinate variable Stock Return has an everyday fee of 120.1476 with a general deviation of 405.0240. During the length of reflection, the return of the provide with the lowest charge of -452,9000 from PT. Medco Energi Internasional Tbk (MEDC) in 2019. During the period of reflection, shares returned with the lowest price of -452,9000 from PT. Medco Energi Internasional Tbk (MEDC) in 2019 and the highest award of 646,000 from PT. Super Energi Tbk (No doubt) in 2019. Medco Energi Internasional Tbk (MEDC) in 2019 and the highest award of 646,000 from PT. Super Energi Tbk (No doubt) in 2019. Medco Energi Internasional Tbk (MEDC) in 2019 and the highest award of 646,000 from PT. Super Energi Tbk (No doubt) in 2019.

Table 1: Statistical data descriptions of each study

Measurement	Variable					
	SR	PL	ROA	EPS	FOREX	WTI
Mean	120,1476	1.364818	-3.111176	-7.714412	0.972941	8.140588
Median	7.000000	0.000000	2.270000	0.000000	0.545000	4.960000
Maximum	2165,000	31.25000	12.66000	3,400,000	2.860000	48.000000
Minimum	-452,9000	-10.60071	-95.23000	-43.86000	0.140000	-9.390000
Standard Deviation	405.0240	8.650783	22.34593	15,44828	0.861410	11.07309

Source: Data processed in 2021

Model of board information provider to be assessed as a determinant of stock returns in energy sub-sector companies, it can be seen in three models, be precise: common impact, fixed effect, and random effect. The board informant model connected in thought to aid investigations by using a combined test for each performance. Based on the combined tests that emerged regarding the use of the At Chow Test, the LM Breusch-Pagan (BP) test, and the Hausman test, it can be explained in Table 2, where there is a strategy that gives rise to information on the selected council. for size and evaluation of the determinant incidence of inventory returns of power sub-sector businesses listed on the Indonesia Stock Exchange from 2018 to 2021 earlier than and after COVID-19 can be proof of an unfair effect on the electricity sub-sector.

4. 2. Panel Data Regression

Investigations with board information show that this judgment uses evidence of improper effects. The choice of an arbitrary has an effect on the method as a facts checking method is primarily based on the effects of the mixed trying out that makes use of the archive processing event, quite a few checking out checks will be carried out, together with the Chow Test, the LM Breusch-Pagan (BP) Test, and the Hausman Test of the three models. which is examined will have an effect on on the effects to be chosen and decided to be chosen and decided and analyzed as a determinant of the sharing stage in electricity sub-sector organizations listed on the Indonesia Stock Exchange for the duration 2018-2021 earlier than and after Covid-19. Table 3 indicates the check consequences of board records with an irregular influence display.

Estimates of the outcome of fixed effects can be compiled in the information retrieval board after a relapse:

$$SR = 331.6147 - 22.77985 * PL - 2.313099 * ROA + 44.56343 * EPS + 130.0749 * FOREX + 3.642512 * WTI + [CX=R]$$

The coefficient of determination (R^2) of this find out about is a measure that shows how an awful lot of the contribution of the unbiased variable to the based variable has occurred. The following are the effects of the coefficient of willpower in this study including:

Based on Table 4, it is defined that the conditions for these occasions are explained, specifically, there is an effect of fee restrict (PL), return on property (ROA), revenue per share (EPS), trading value (FOREX), oil charge volatility (WTI), from inventory returns (SR) zero (Balanced R-squared). = 0.343767).

Table 2: Conclusion of the panel data regression model test

Method	Test	The result
Trials	Common effect versus fixed effect	Common effects
Lagrange multiplier-BP	Common effect versus random effect	Random effects
Hausman test	Fixed effect versus Random effect	Fixed effect

Table 3: Fixed affect test results

Variable	Coefficient
C	331.6147
PL	-22.77985
ROA	-2.313099
EPS	44.56343
FOREX	130.0749
WTI	3.642512

Table 4: Coefficient of determination

R-squared	Weighted statistics		
	0.343767	Means it depends on the var	120,1476
R-squared is adjusted	-0.082785	SD dependent variable	405.0240
SE regression	421.4556	Add up the remaining squares	15,21821
F-statistics	0.805921	Durbin-Watson statistics	2.165573
Prob (F-statistic)	0.008304		

This capability that has an impact on self-reliant variables on subordinate variables is 34.37% and the rest is influenced by different factors no longer protected in this study.

4. 3. Hypothesis Test

In testing this hypothesis, it can explain the determination of the influence of independent variables on subordinate variables in this study, we try to test each of the irregular effects and show the relapse coefficient as a determinant of stock returns in energy sub-sector companies before and after the Covid-19 pandemic, by the usage of the t-test. The t take a look at what used to be performed to decide whether or not every one of the self-sustaining elements used in this learn about should affect the rationalization of inventory returns in the power sub-sector businesses as subordinate variables. Where is the 95% certainty level or five percent alpha (α)? = 0.05)., or it may use a 90% certainty level or a break-even alpha of ten percent (α = 0.10) depending on how much certainty is used in this study.

The effects of partial statistical tests for every one of the variables that affect the stock returns of groups in the energy sub-sector can be considered in Table 5. For the effect of the variable price limit (PL), earnings per share (EPS), and oil price volatility (WTI) partially on returns. shares were the most important things of each will be described and compared with the research theory used.

Based on the results of the research concept testing above, it can be seen that the occurrence of charge restriction (PL), salary per share (EPS), and oil price volatility (WTI) is one of the contributing factors. which reduces the α rate from α which needs to be viewed at the 0.05 level and the oil price volatility (WTI) has a lower α price than the fundamental level of 0.10.

The experimental findings of this reflection are in line with the query of hypothesis which states that price limit (PL), earnings per share (EPS), and oil price volatility (WTI) influence the occurrence of shares. The yields of energy sub-sector companies recorded in the Indonesian Stock Trading period 2018-2021 before and after Covid-19. Meanwhile, the ROA and FOREX factors have a better esteem α compared to the centrality level of 0.05. The findings of the experimental thinking are now not in line with the investigative theory which states that ROA and FOREX affect the stock returns of electricity sub-sector corporations listed on the Indonesia Stock Exchange for the length 2018-2021 earlier than and after Covid-19.

4. 4. Discussion

Based on the remark findings, the price limit (PL) variable has a poor effect on stock returns of the electricity sub-sector corporations however is now not critical. This contradicts the main hypothesis, which is where it explains that this research weakens the research hypothesis, namely that the information determined in a company has a volatility level in stock returns after a period of limit attainment, both for stocks that experience an increase or decrease in price. (Hasanudin et al., 2020) stated that price limits play a role in limiting daily stock price movements which are very extreme. The emergence of statements from this study is again a question carried out by, Nalurita (2015), Jasman and Kasran (2017), and Sari and Endri (2019).

Based on observations, this study states that the variable return on assets (ROA) has a negative effect and needs to be considered in determining stock returns in energy sub-sector companies before and after Covid-19. Where this explains that this study strengthens the flag hypothesis, namely that the information specified in a company has a rate of return on existing resources, both as a calculation of productivity and the number of benefits that can be used from the resources released from the company. Itself, with the Note, that if a company can have a great product, it will send a good flag among partners. The emergence of statements from

this research is again a question carried out by Nalurita (2015), Jasman and Kasran (2017).

The result of this reflection states that the variable earning per share (EPS) has a positive effect on stock returns of energy sub-sector companies but is not critical. This supports the main hypothesis, namely specifically that the amount of profit distributed to investors is greater so that this increase in EPS will attract investors to buy shares, with a demand that causes a price increase. The company's stock return will also increase. Midesia et al. (2016), (Nurlaela et al., 2019). Earning Per Share companies that earn Earning Per Share larger inconsistencies have large stock returns. This is because the company's ability to use the assets it uses is less effective, resulting in very low profits. In other words, a positive coefficient value explains that the greater the EPS will attract investors to buy shares.

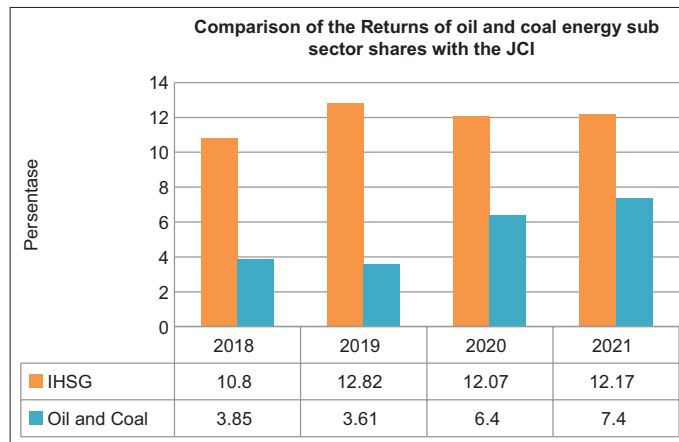
Based on the outcomes of this study, it is explained that the rupiah alternate fee variable has a bad and noteworthy impact on inventory returns in oil and fuel mining organizations in Indonesia at some point of the Covid-19 pandemic. This shows the declaration that the weakening of the rupiah change price has a positive impact on the price of return of an oil and fuel mining employer imparting because most of the goods despatched by using oil and fuel mining corporations are exported and there is an overseas currency exchange. an agreement in which the technique of the usage of overseas currency is the implication. For the installment price process. Usually, an make bigger in the rupiah trade price is additionally accompanied by an increase in the cost of shares, due to an extend in salaries or benefits. This thinking is taken after the arbitrage estimation speculation (Able) which states that security returns are now not affected by using storefront portfolios but are influenced by the presence of different sources of danger. Therefore, in particular, there is a macroeconomic variable, in this case, particularly the rupiah alternate rate. Based on the results of this study, it applies to the lookup performed using Assagaf et al. (2019), (Yeboah and Takacs, 2019), (Kumar, 2020), Khan (2019), and Wahyono et al. (2019). Based on the effects of this study, it is relevant to the research performed by way of Assagaf et al. (2019), (Yeboah and Takacs, 2019), (Kumar, 2020), Khan (2019), and Wahyono et al. (2019). Based on the consequences of this study, it applies to the research conducted utilizing Assagaf et al. (2019), (Yeboah and Takacs, 2019), (Kumar, 2020), Khan (2019), and Wahyono et al. (2019).

Based on the consequences of the research that has been done, it can be seen that the variable world oil volatility (WTI) has a high quality and necessary effect on the rate of return of supplies in energy sub-sector organizations in Indonesia in line with the Covid-19 pandemic. Usually, an enlarge in the value of oil will add a large gap for oil-producing corporations to reap greater revenues. In addition to mining agencies that produce oil, the increase in oil expenditures motives classified ads and sponsors too are trying to find elective energy as a replacement for oil, for example, the non-compulsory strength that is extensively used is coal, which has a greater chance of gaining profit. This happened because the variable cost of world oil was one of those that had

Table 5: Hypothesis test results (t-test)

Variable	Std. Error	t-statistics	Problem	Conclusion
PL	10,67039	-2.134866	0.0453	Significant
ROA	5.537433	-0.417720	0.6806	Not significant
EPS	37,04028	1.203107	0.0243	Significant
FOREX	159,7047	0.814471	0.4250	Not significant
WTI	20,73889	0.175637	0.0176	Significant

Figure 2: Implementation of Jakarta composite listing and return of shares in the energy sub-sector



Source: Indonesia stock exchange reprocessed

a critical impact on oil and gas mining companies in Indonesia during the Covid-19 pandemic. Where the results of this study are reinforced by statements from Huang and Mollick (2020), Ma et al. (2019), Wahyono et al. (2019), (Diaz and de Gracia, 2017), and Gunarto et al. (2020).

5. CONCLUSION

From the research results, it is known that the variable price limit (PL) and states that there is no stock return in the energy sub-sector return on assets (ROA) listed on the Indonesia stock exchange for the period 2018-2021 before and after the Covid-19 Pandemic. The return on resources (ROA) and trade rate (FOREX) factors have a terrible and vital effect on stock returns. While the elements of price limit (PL), Earning Per Share (EPS), and world oil cost (WTI) affect the return of shares of strength sub-sector companies, specifically oil and coal listed on the Indonesia stock exchange in the 2018-2021 duration before and after Covid-19.

Administrative recommendations or suggestions for investigations that occur relating to factors that have an important impact. Financial specialists and potential financial specialists must consider the factors that can affect the rate of return of the offer. Because the return on shares is used as the level of implementation of the company by financial specialists to contribute to the company in capital advertising. Proposals for this inquiry could be made by including the various internal components, calculating return on value, firm estimates, open ownership, and outside variables that account for the executive board, interest rates, cash supply, and swelling. To obtain better investigative results, it is determined that the expert analyst can strengthen the period and other industry divisions used in the investigation.

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