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The Effect of Financial Ratio on Stock Price Volatility

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Abstract

This research aims to examine the influence of financial ratios, namely TATO, EPS, ROA, and DER on company share price volatility. This information provides a signal about the company's prospects to external parties, especially investors. The population used in this research includes companies in the energy, industrial, technology and infrastructure sectors listed on the Indonesia Stock Exchange (BEI) with observation years 2020 to 2022. Sample selection used a purposive sampling technique. The total population is 215 companies with a total sample that meets the criteria of 169 companies. The analysis technique used is Multiple Linear Regression analysis with a total of 165 data processed. The results of this research show that the TATO variable has a significant positive effect on stock price volatility, while the EPS, ROA and DER variables have no effect on stock price volatility. In general, this research provides consideration of factors that influence stock price volatility for investors in investing decisions.

Keywords: TATO, EPS, ROA, DER, Share Price Volatility

1 Introduction

Companies set share prices for investors who have share ownership rights. According to Hartono (2013: 160), market participants and the supply and demand for the shares concerned in the stock exchange market determine the share price. In general, the share price is determined to determine the value of the shares. The purpose of knowing the value of shares for investors is to make decisions in investing. The more the stock value increases, the more the value increases as a consideration for investors to decide to buy ownership in the company. If the lower the value of the company's shares, the value of the company is certain to decrease. Low stock prices that make companies have to really look at stock prices in the stock market because stock prices fluctuate.

According to Fahmi (2014:276) the determining factors for stock price fluctuations are economic conditions, both small and large, company regulations for business expansion, sudden changes in directors due to involvement in criminal acts, declining company performance, the influence of market psychology in managing technical conditions for buying and selling shares. The volatile and volatile nature of commodity markets (such as oil and precious metals) and stock markets

makes it important for investors to consider where they are investing (C. Ren, 2022); (Ngoc, 2022). According to research by Kinoti Kima et al. (2024) in developing markets in Southeast Asia, inflation does not really drive stock price fluctuations. There is research that states that company mergers can also influence investor decisions (Sayed, 2024). To overcome these stock price fluctuations, it is necessary to measure the magnitude of changes in stock prices, which is called stock price volatility.

Volatility is the amount of risk or uncertainty associated with the variation in the value of a security (Marobhe at al., 2020). When associated with stock prices, stock price volatility is a measurement of the variation in the price of an asset over a certain period of time (Yan et al., 2024). The measure of price fluctuations in finance is an understanding of volatility and becomes a parameter of a trading section (Agung, 2021). The ups and downs of stock prices that are getting bigger or unstable cause an increase in stock price volatility. High stock price volatility causes uncertainty in investment returns (Angesti, 2019); (Hieu Nguyen et al., 2020), whereas if the level of volatility in shares is low, it indicates a stable price (Siddique, 2020). Several studies have used the stock price volatility indicator as one of the determinants of stock credibility, where the higher it is, the more positive it will be for increasing the company's profitability (Taha et al., 2023). It is known that rising oil prices can affect stock price volatility which will increase market risk (X. Ren et al., 2022). Changes in market information can also affect stock price volatility (Wu, 2020). If the information obtained is good, it will increase the stock price, otherwise it will decrease the stock price (Wang et al., 2024). This stock price uncertainty is a matter of discussion before making decisions for investors in investing shares.

Researchers chose companies engaged in energy, industry, technology, and infrastructure because these four fields are market sectors that are in demand by investors. This is the focus of researchers where if volatility is high, it means that the share price will also rise very high and quickly but then will fall quickly too. This creates a large gap between the highest and lowest prices. Based on past price considerations (historical calculations) the volatility of a stock can be determined by calculating the variance and standard deviation or square root of the variance. Investors who want to trade stocks, need to pay attention to the volatility of these stocks. The high volatility of a stock has the potential for the price to rise even though it is offset by high risk and returns in a short time.

Apart from these measurements, investors can also use the financial ratios of a company as a reference in investing. In a company, it must present financial statements that are reported every one year of the current period. The financial statements promise financial information that occurs in the company such as total assets, liabilities, equity, sales, and expenses. This financial information can be used as material to calculate financial ratios including Total Asset Turnover, Earnings Per Share, Return on Asset, and Debt to Equity Ratio.

TATO is the ability of the company's asset turnover at a certain time and the ability of assets to create profits from the sales made (Sujarweni, 2017); (Al Omari et al., 2023). The number of sales generated by the company indicates the effectiveness of the company's asset turnover (Wijaya, 2017). According to Hayat (2014), TATO with a large value indicates the company's sales results are of great value. The ability to increase sales can trigger investor interest in buying ownership of the company, so this directly affects the company's increasing share price. An increasing share price can affect the volatility of the company's share price. According to research Sihaloho et al (2021) and Wijaya (2017) stated that TATO has a significant impact on stock prices where increasing stock prices cause stock price volatility to also increase. In contrast to (Purbawati, 2020) and (Wulandari, 2020) which show the results of TATO does not significantly affect stock prices.

The company's capability in creating profit from the sale of shares per sheet is calculated using EPS (Munggaran, 2017). This profit generation by shares per sheet can make investors want to invest in stocks. According to Graham (1973) and Buffett in Atmaja and Thomdean (2015), investors consider the increase in EPS ratio from time to time to be a standard or benchmark in determining investment decisions. This is because the amount of earnings per share makes the opportunity for the share price to increase. Stock price volatility is influenced by an increase in the company's stock price. According to Sihaloho et al (2021), Angesti (2019), and Utami et al (2018) EPS affects the company's stock price which can also affect stock price volatility. However, research Mardiati (2019) proves the opposite result where EPS does not have a significant effect on the company's stock price.

ROA is also taken into consideration by researchers regarding the profitability of the company in terms of company assets. ROA is a measure that shows that the company is able to collect profits by empowering all assets owned by the company as investment capital (Mamduh, 2004: 83). This investment is one form of the company in optimizing profits. The amount of return generated makes these assets useful to generate profits for the company. This profit income is the subject of study for investors to invest in shares. According to research Sulistyani et al. (2022), Arifiani (2019), and Lubis et al. (2021) state that ROA can have an impact on stock prices so that stock price volatility changes. As the research results from Thinh (2021), show that profitability factors, namely ROA and ROE, have a positive influence on responsibility accounting disclosure (ADISC) in commercial banks registered in Vietnam, this data can also be a consideration for investors because of the relevant accounting data. Meanwhile, according to Manulang et al. (2021) and Meidiyustiani (2021) ROA does not have a significant effect, even has a significant negative impact on the company's stock price. Likewise, a study of companies listed on the Karachi Stock Exchange found that total debt did not have a significant effect on profitability when measured by ROA (Adesola et al., 2022); (Khan et al., 2023).

DER is a ratio to review how far debt can finance the company's assets. Debt is something that cannot be avoided in building a business. Companies that have debt are obliged to pay off the debt (Suroto, 2012). According to Darmawan (2014), this debt burden can cause a decrease in company profitability due to the burden of obligations that must be fulfilled and coupled with interest on loans. So that if the debt of a company is getting bigger, this becomes a reconsideration for investors in investing their capital. This is because the profit or profit generated by the company is a benchmark for investors in investing. According to research Sihaloho et al. (2021), DER has a negative effect on the entity's share price. It is different with Purbawati (2020) and Cahyawati et al. (2022) who said that DER has a positive impact on the company's stock price.

Based on the explanation of the effect of TATO, EPS, DER, and ROA on the company's stock price which can also have an impact on stock price volatility, researchers are interested in conducting research on this topic "The Effect of Financial Ratios on Stock Price Volatility".

2 Literature Review

2.1 Signalling Theory

Signalling theory is the ability of company management to provide direction to investors regarding company opportunities. This action is carried out by providing information related to the company's finances. According to Jogiyanto (2016), the publication of this information give a signal for investors in investing. The signal in question is a signal that is deliberately conveyed by the company through information on high company profits (Wufron, 2017). The openness of

this financial information greatly influences investor decision making, as evidenced by research conducted by Olszewski where the company's openness to the external environment significantly affects the development of R&D projects (Olszewski, 2022). Information related to financial reports in a company can provide signals to stock price volatility, where financial reports are the basis for investors to determine investment resolve which later form stock prices, and this stock price has an impact on stock price volatility (Alamsyah et al., 2022). Good news, if the information signal is related to the profit obtained by a company. Bad news, if the information signal is related to the losses experienced by an entity.

2.2 TATO

TAT plays an important role in investment decisions (Raza et al., 2024). The higher the TATO value of a company indicates the company's potential in empowering its assets to obtain higher profits. This can be seen from the calculation of the TATO ratio which divides the company's sales by its total assets. High TATO is a clue for investors to buy ownership in the company. The amount of TATO indicates that the number of sales is increasing, this shows that the company's competence is good and can trigger investor interest in buying ownership in the company. The increase in stock price will result in stock price volatility. The results of research by Sihaloho et al. (2021), and Wijaya (2017) state that TATO has a positive impact on stock price volatility.

2.3 EPS

Shareholder value is proxy in the model Earnings Per Share (Iwedi et al., 2020). The amount of EPS in the company indicates that the more profit per share the company can generate. EPS is considered to be able to describe the company's future earnings prospects (Farida et al., 2019). The greater the profit per share generated, the greater the possibility of investors to invest in shares. The ability to generate profits is good news for investors and makes the company's stock price rise. The increase in stock prices affects stock price volatility. The results of research Angesti (2019) dan Utami et al. (2018) show that EPS has a positive impact on stock price volatility.

2.4 ROA

ROA is a calculation of the amount of return that can be generated by the company based on the amount of assets used as investment material by the company (Raza et al., 2024). The amount of this return indicates the company’s capability to create net profit from existing assets (Rahayu, 2023). This is good news and is able to increase the interest of investors in investing in the company because there will also be a large stock return. The amount of stock return affects stock price volatility. The results of research Sulistyani et al. (2022), Arifiani (2019), dan Lubis (2021) said that ROA has a positive impact on stock price volatility.

2.5 DER

The amount of DER of an entity indicates the amount of debt that the company is responsible for. This debt symbolizes that the company cannot be separated from the help of external parties. So that the more debt a company has, the more responsibility the company must fulfill. This is bad news for investors. A situation where the company has more debt than profit causes investors to have less interest in the company's shares. The decline in stock prices is the cause of the lack of investor interest. The decline in stock prices results in movements in stock price volatility. In Sihaloho et al. (2021) research, it states that DER has a negative influence on stock price volatility.

3 Research Method

Quantitative research type is used in this study. According to Sekaran and Bougie (2013, p. 2), quantitative research is the process of processing data in the form of numbers to be analyzed with a statistical calculation model. Types of secondary data processed in this study. Independent variable data was got from IDX (https://www.idx.co.id/id), a web that serve financial report data for each company registered on the Indonesia Stock Exchange from 2020 - 2022. The dependent variable data is obtained from IDN Finance (https://www.idnfinancials.com/id/), a website that offer data on the ups and downs of the company's stock prices on the Indonesia Stock Exchange. Processing of the lowest to highest stock price data for the whole year for each year observed.

Energy, industry, infrastructure and technology sector companies registered on the IDX in 2020-2022 became this study population. The purposive sampling method is used as a way to take research samples, namely those that fall within the sample criteria which include:
1. Companies that publish financial reports in the energy, industry, infrastructure, and technology sectors and are listed on the IDX in 2020-2022.
2. Shares of related companies are active and traded on the IDX.

Table 1: Population and Sample

Years	2020	2021	2022
Populations	63	74	78
Those that did not meet the sample criteria:			
1. Companies engaged in the energy, industry, infrastructure and technology sectors registered on the IDX for the period 2020 - 2022 that do not publish financial reports.	(1)	(0)	(0)
2. Companies engaged in the energy, industry, infrastructure and technology sectors whose shares are not actively traded on the IDX.	(15)	(15)	(15)
Companies used in research	47	59	63

Based on the calculation in the table above, we find that the total population is 215 companies. One company does not publish its financial statements on the IDX and 15 companies are not actively traded on the IDX. There are 169 data that meet the sample criteria, namely per year 2020 there are 47 companies, per year 2021 there are 59 companies and per year 2022 there are 63 companies that can be used as research data. After data processing, there are 4 outlier data companies so that the research data processed for further tests is 165 observation data.

This study will empirically verify the effect of TATO, EPS, ROA, and DER on stock price volatility in companies engaged in energy, industry, technology, and infrastructure traded on the IDX. Therefore, the variables used are stock price volatility (Y) as the dependent variable and the quality of TATO (X1), EPS (X2), ROA (X3), and DER (X4) as independent variables.

Table 2: Variable Measurement

No	Variabel	Operasional Definition	Measurement	Reference
1.	*Share Price Volatility*	Share price volatility is a measurement to	Square = (Hi – Li) / (Hi + Li/2))^2 SQRT = Square^0,5	Haque et al. (2019)

		determine the rise and fall of a company's share price.	Hi = Highest share price in year i Li = Lowest share price in year i i = Year of observation	
2.	*Total Asset Turnover* (TATO)	TATO is a calculation to determine a company's asset turnover by looking at the amount of sales it has to generate how much profit it can generate.	TATO = Sales / Total Asets	Wijaya, 2017
3.	*Earnings Per Share* (EPS)	EPS is a calculation to determine the profit obtained from net profit resulting from the share price per share.	EPS = Profit After Tax / Shares Outstanding	Munggaran, Mukaram, and Sarah, 2017
4.	*Return On Asset* (ROA)	ROA is a ratio to find the quantity of return a company obtains from the investment results of the total assets it owns.	ROA = Profit After Tax / Total Assets	Kasmir, 2012 and Wufron, 2017
5.	*Debt to Equity Ratio* (DER)	DER is a ratio to compare the company's total debt and equity in order to know how much obligations still need to be fulfilled.	DER = Total Debt / Equity	Hery, 2015

4 Results and Discussions

Multiple linear regression analysis is a way to analyze research data. The first analysis carried out was the residual normality test, and continued with the classical assumption test composed of multicollinearity test, heteroscedasticity test, and autocorrelation test (Durbin-Watson). After all tests are passed, then test the model and test. The regression equation model is as follows:

$Y = \alpha + \beta 0 + \beta 1TATO + \beta 2EPS + \beta 3ROA + \beta 4DER + e$

Description:

Y	: Stock Price Volatility
A	: Constant
β0, β1, β2, β3, β4	: Independent variable coefficient
TATO	: Total Asset Turnover

EPS : Earning Per Share
ROA : Return On Assets
DER : Debt to Equity Ratio
E : Error term

Descriptive Statistical Analysis

Descriptive statistical analysis serves as an explanatory object of the collected data (Sugiyono, 2011). This analysis aims to offer an explanation regarding the minimum, maximum, average (Mean), and standard deviation values.

Table 3: Descriptive Statistical Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
TATO (X1)	165	0,00	11,61	1,0041	1,78439
EPS (X2)	165	-248,25	2786,13	21,2519	222,77948
ROA (X3)	165	-0,41	0,41	0,0225	0,09700
DER (X4)	165	-34,93	843,09	7,1185	65,88648
Stock Price Volatility (Y1)	165	0	2	0,72	0,377

Residual Normality Test

The residual normality test serves as a measure of whether the residual values are normally distributed (Ghozali, 2016). The residual normality test tool used is skewness and kurtosis with the condition that if the resulting value is ± 1.96, the residual value is normally distributed.

Table 4: Residual Normality Test

Skewness		Kurtosis	
Statistic	Std. Error	Statistic	Std. Error
0,366	0,189	-0,666	0,376

The table above signify that the skewness point is 1.936 < 1.96 and the kurtosis point is 1.771 < 1.96. Thus, this research data is normally distributed.
The following is the calculation:
Skewness value = 0.366/0.189 = 1.936
Kurtosis value = -0.666/0.376 = 1.771

Classical Assumption Test

This test is a test to find whether there are errors in classical assumptions (Syahfitri, 2022). This test consists of several types, namely multicollinearity, heteroscedasticity, and autocorrelation test (Durbin-Watson).

1. Multicollinearity Test
   According to Wibowo (2012:87), if there is a relationship between independent variables, there should be no multicollinearity. If it occurs in the data tested, the independent variables are correlated. This can be recognized by the tolerance and the Variance Inflation Factor (VIF) values. According to Gujarati (2012: 432), the Multicollinearity Test has provisions, namely:

1. If the tolerance value > 0.10 then there is no multicollinearity.
2. If the VIF value < 10 then there is no multicollinearity.

Table 5: Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
TATO (X1)	0,836	1,197
EPS (X2)	0,827	1,210
ROA (X3)	0,985	1,015
DER (X4)	0,998	1,002

The table above signify that all tolerance values are greater than 0.10, which means that the data does not experience multicollinearity. This calculation also indicates that there is no multicollinearity because the VIF value is < 10.

2. Heteroscedasticity Test

This test is tasked with checking the inequality of the regression model that occurs with other variances and residuals. The Glejser test is performed to regress variable X on the absolute value of the residuals, if the significance value on the regression coefficient is> 0.05 then there is no heteroscedasticity.

Table 6: Heteroscedasticity Test

Model	Sig.
TATO (X1)	0,161
EPS (X2)	0,779
ROA (X3)	0,207
DER (X4)	0,184

The table above signify that the significance value obtained are for each variable is TATO of 0.161, EPS of 0.779, ROA of 0.207, and DER of 0.184. This calculation states that heteroskedasticity doesn't transpire because the significance value has met the standard (> 0.05).

3. Autocorrelation Test (Durbin-Watson)

The autocorrelation test is a test to look for a relationship between confounding errors in a certain period and the previous period in a regression model. How to determine whether autocorrelation occurs or not is by calculating the Durbin-Watson (DW) test, where if the du (durbin upper) value < Durbin-Watson value < 4 - du (durbin upper) then there is no autocorrelation.

Table 7: Autocorrelation Test (Durbin-Watson)

Model	Durbin-Watson
1	1,901

The table above signify the Durbin-Watson value is 1.901. In determining this comparison, the Durbin-Watson table is needed to determine the du value according to the number of independent variables (K = 4) and the amount of data processed (N = 165). Where based on the provisions of the autocorrelation test this result indicates that this value does not experience autocorrelation. The following is the calculation of the autocorrelation test: du value ◊ K = 4 (independent variables), N = 165

du < DW < 4 - du
1.7953 < 1,901 < 4 - 1.7953
1.7953 < 1,901 < 2,203

Model Test

The model test shows the relationship or influence of the dependent and independent variables. This test includes two types, namely the F test and the Coefficient of Determination test (Adjusted R^2).

1. F test
   The F test is conducted to identify whether the research model is feasible / fit if the significance value is < 0.05.

   Table 8: F test

Model	df	Sig.
1 Regression	4	0,009
Residual	160	
Total	164	

   The calculation results signify that the significance value is 0.009 <0.05 so that this research model is concluded to be feasible.

2. Test Coefficient of Determination (Adjusted R^2)
   The test which aims as a benchmark for how specific the model can explain the dependent variable with a coefficient value between zero and one (Ghozali, 2016). The magnitude of the coefficient value close to one indicates the competence of the independent variable (X) to give information to estimate the dependent variable.

   Table 9: Test Coefficient of Determination (Adjusted R^2)

Model	Adjusted R Square
1	0,038

   Based on the table above, the coefficient of determination is 0.038 where the independent is able to predict the dependent variable by 3.8% and the remaining 96.2% (100%-3.8%) is caused by variable factors outside the study.

Hypothesis Test

Hypothesis testing is an experiment conducted to decide whether the hypothesis prepared is in accordance with the results of data processing, so that it can determine whether a hypothesis is accepted or not.

The t tests
This t test helps to detect whether each independent variable will affect the dependent variable or not. If the calculated t value> t table value or significance value <0.05, then the independent variable has an influence on the dependent variable.

Table 10: t test

Model	Test Results		Hypothesis	Result	Conclusion
	B	Sig.			
TATO (X1)	0,049	0,010	+ Sig	+ Sig	Berpengaruh
EPS (X2)	9,907E-5	0,517	+ Sig	+ Tidak Sig	Tidak Berpengaruh
ROA (X3)	-0,005	0,988	+ Sig	+ Tidak Sig	Tidak Berpengaruh
DER (X4)	0,000	0,588	- Sig	+ Tidak Sig	Tidak Berpengaruh

The following is a discussion of the results of hypothesis testing:

1. The significant value of TATO of 0.010 < 0.05 indicates that the TATO variable has a significant effect on stock price volatility. H1 is accepted. The amount of TATO value of a company indicates the number of sales in the company. The greater the sales that occur, the more profit or profit received which can cause the stock price to increase. Changing the share price affects the volatility of the company's share price. This research is in line with Sihaloho et al. (2021) and Wijaya (2017) who suggest that the TATO ratio has an influence on stock prices, so that the effect of this ratio on stock prices will also affect the volatility of the stock price. Meanwhile, in the research of Purbawati (2020) and Hikmah et al. (2020) who states that TATO has no significant effect on stock price fluctuations.
2. The significant value of EPS of 0.517 > 0.05 shows that EPS has no significant effect on stock price volatility. H2 rejected. The amount of net profit that can be obtained by the company does not make EPS a factor of consideration for investors when faced with determining investment decisions in the company. This is because the ability to generate profits each year can fluctuate (both up and down) so that this instability also cannot be an assessment material by investors in investing. This study is consistent with Mardiati et al. (2019) claimed that EPS had no significant effect on stock price volatility which in line with this research. This research is not in line with Munggaran et al. (2017), Girsang et al. (2019), and Sihaloho et al. (2021) who state that EPS has a significant positive effect on stock prices, so it has no effect on stock price volatility.
3. The significant value of ROA of 0.985 > 0.05 indicates that ROA has no significant effect on stock price volatility. H3 is rejected. The size of the ROA owned by a company is not necessarily a benchmark for investors to invest their equity. This is because ROA can experience unstable fluctuations, the ability to generate profits is different each year so that investors do not just rely on ROA alone. This research is in line with Niazi (2021) which states that ROA has no significant effect on stock price volatility. In contrast to Sulistyani (2022), Arifiani et al. (2019), and Lubis (2021) proclaims that ROA has a significant positive effect on stock prices, so it does not affect stock price volatility.
4. The significant value of DER of 0.998 > 0.05 indicates that DER has no significant effect on stock price volatility. H4 is rejected. The amount of debt of a company has no effect on the movement of the company's stock price. The amount of debt owned by the company does not cause the company to depend on external parties and not pay off its obligations. Likewise, the lack of debt does not cause the company to generate better profits. Similarly, research from Wijaya (2017) states that DER has no significant effect on stock price volatility. This research contradicts Sihaloho et al. (2021) and Girsang et al. (2019) who suggest that DER has a significant negative effect on stock prices, so it has no impact on stock price volatility.

5 Conclusions and Recommendations

It can be concluded that TATO affects stock price volatility. While EPS, ROA, DER do not affect stock price volatility. In this study there are several limitations that have the potential to change

the research results and are expected to be corrected and developed in further research. Measurement of stock prices throughout the year used so that the highest and lowest price data is not very specific. It is hoped that further research can utilizes each month's highest and lowest stock price data. The Coefficient of Determination (Adjusted R^2) value is too small, resulting in the independent variable being less able to explain the dependent variable. In further research, other variables that can affect the dependent variable can be used.

The involvement relationship that can be emphasized from this research is that investors are expected to be concerned about factors that can affect the volatility of the company's stock price so that it can be a consideration for investing their shares. This research is expected to be a benchmark for managerial in companies listed on the IDX to further improve the company's financial performance, and can be a consideration in taking the next step for the company's progress.

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