

The Influence of Profitability on Stock Return with Inflation as a Moderating Variable

(Empirical Study on Automotive Companies and Components Listed in Indonesia Stock Exchange 2013-2017)

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Abstract—This study aims to analyse the effect of profitability on stock returns with inflation as a moderating variable. The variables tested in this research are profitability proxy for Return on Assets (ROA), Return on Equity (ROE) and Net Profit Margin (NPM), inflation and stock returns. The sample of this research uses 12 automotive companies and automotive components that consistently published financial statements in the Indonesia Stock Exchange period 2013-2017. Samples were taken by purposive sampling method which is a method of samples based on certain criteria. These variables analysed using panel data regression. In this study, testing hypotheses used the t test, F test and regression used Moderated Regression Analysis (MRA). Panel data regression results showed Adjusted R-squared of 0.153836, which means that the magnitude of the influence of the independent variable moderated by inflation on the dependent variable that can be explained by this equation model is 15.38%. While the remaining 84.62% is influenced by other factors not taken into account in this regression model. The conclusions of this research show that ROA has a significant positive effect on stock returns, ROE has a negative effect on stock returns, NPM has no effect on stock returns, ROA moderated by inflation has a negative effect on stock returns, ROE moderated by inflation has a significant positive effect on stock returns, and NPM moderated by inflation does not affect stock returns.

Keywords: ROA, ROE, NPM, inflation, stock return

I. INTRODUCTION

Continuity of operations of a company as well as expanding the company's business must be available financial funds. Additional company financial funds can be obtained through various ways including: additional investment from company owners, funds from loans and funds from selling shares to the public. Capital market is a market where capital funds, such as equity and debt are traded [1]. The main objective of investors conducting stock investment activities in the capital market is to obtain profits from the shares they bought. These benefits include: investors get payment of profit sharing or dividends from the company and also gain a difference in the price of shares (capital gains), namely the selling price of shares reduced by the purchase price of shares.

Investors try to obtain maximum stock returns, then investors use various methods to analyse the behaviour of stock trading and by analysing other economic information related to expected profits. Investors in investing in stocks, choose companies with the ability to generate high profits or profits. Profitability is a financial ratio that can be used to measure the level of profit with assets, investments and sales. Companies that have a high level of profitability ratio are considered as companies that have good performance.

Stock return is influenced by several factors, one of the factors that influence it is the inflation factor. Inflation has fluctuated every year, this can be caused by government policies such as an increase in fuel prices, electricity increases, changes in transportation rates and others. With the increase in prices of goods, the company will experience an increase in operating costs so that the company's profits will fall. With a decrease in profits of a company, it means that profits distributed to investors (dividends) will also go down or small. Dividends obtained by small investors can be interpreted as stock returns to small investors.

The automotive industry is one of the mainstays of national industry policy, the automotive industry can provide great value in gross domestic product. The automotive industry is expected to not only prioritize their business, but must support the government's program to have a strong automotive production base. This is consistent and in line with government decisions, namely the necessity of the Indonesian automotive industry to use certain domestic components and local content.

II. LITERATURE REVIEW

A. Signalling Theory

States that accounting information is used to show how the company's value and claims against it will change. Accounting reports are used to monitor or confirm events and transactions that have occurred. In studies of capital markets managers are assumed to provide information for decision making by investors. This hypothesis regarding accounting information is

closely related to signalling theory, where managers use accounts to signal their expectations and goals in the future [2].

B. Share Prices

Public company shares are traded on organized exchanges, the interaction between buyers and sellers determines the price per share [3]. Some values related to shares are book value which is the value of shares according to the issuer's company books. While the market value is the value of shares in the stock market. And intrinsic value is the true value of shares or the true value of the company [4].

C. Profitability

There are many measures of profitability. As a group, these steps allow the analyst to evaluate the company's profits with respect to increasing sales levels, certain asset levels, or owner investments. Without profit the company cannot attract outside capital. Owners, creditors, and management pay close attention to increasing profits because of the importance of the market's move towards income, so that investors get a good return [5]. Profitability is a ratio that illustrates the ability of companies to get profits through all the capabilities and existing sources [6].

D. Return On Assets (ROA)

ROA is a measure of earnings per dollar of assets of a company and it can be defined in several ways but the most common is a company's net profit divided by total assets [7]. The easiest form of profitability ratio analysis is to link net income or net income with total assets on the balance sheet [8].

E. Return On Equity (ROE)

ROE ratio is used to measure the return on investment of shareholders. This figure shows how well management utilizes the investment of shareholders. The ROE level has a positive relationship with stock returns, so the greater the ROE the greater the stock returns because the amount of ROE gives an indication that the returns to be received by investors will be high so investors will be interested in buying these shares [6].

F. Net Profit Margin (NPM)

NPM is a relationship between net income after tax and net sales shows the ability of management to drive the company quite successfully, not only to recover the cost of inventory or services, operating expenses including depreciation and loan interest costs, but also to leave certain margin as a reasonable compensation for owners who have provided their capital with a risk [8]. This ratio shows how much percentage of net income earned from each sale [6].

G. Inflation

Inflation is as a process of rising prices that apply in an economy [9]. According to Bank Indonesia inflation is defined as an increase in prices in general and continuously within a certain period [10]. An increase in the price of one or two items alone cannot be called inflation unless the increase is widespread and affects and results in an increase in the prices of other goods.

H. Stock Return

Return is the result obtained by investors from investment funds. Returns can be either realized returns that have already occurred or expected returns that have not yet occurred but which are expected to occur in the future. Realized returns are calculated using historical data. Total return is the return of the entire investment in a given period. Total return consists of capital gain (loss) and yield [4].

I. Research Conceptual Framework

The conceptual framework in this research can be seen in the figure below:

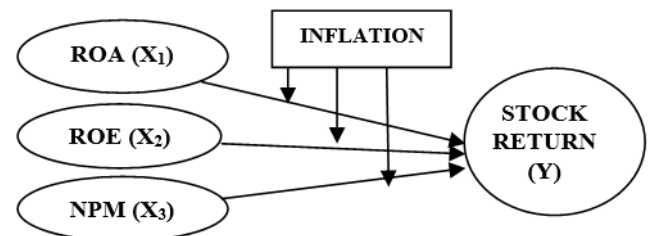


Fig. 1. Research conceptual framework.

III. RESEARCH METHODS

A. Research Strategies

This research uses quantitative causality. Causal statements explain what is sometimes called a cause and effect relationship. The cause is called the independent variable while the affected variable is called the dependent variable [11]. Causality is a research design that is prepared to be used to examine the possibility of a causal relationship between variables [12].

B. Population and Sample

1) *Research population*: States the population is a group of people or objects that have similarities in one or several things and forms the main problem in a particular research [13]. The population in this study were automotive companies and components listed on the Indonesia Stock Exchange during 2013 to 2017. The population in this study were 13 companies.

2) *Research sample*: Sampling in this study using a purposive method. Purposive sampling is a technique used to determine research samples with certain considerations with the aim that the data obtained will be more representative [14]. The sample used in this study were 12 companies. Companies with a BOLT code were not sampled because they were listed on the IDX in 2015, so the company did not publish financial statements on the IDX in 2013 and 2014.

C. Data Analysis Method

The method used in collecting data in this study uses non-participant observation. While the data analysis method uses panel data regression data analysis techniques. To calculate the accuracy and reduce errors, researchers do not do the

calculations manually, but the authors use a computer through the EViews application program. Determination of the level of significance at the 95% confidence level or α 0.05. EViews application program besides getting accurate, precise results and also data processing can be done quickly.

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics

Based on the results of the descriptive statistical analysis, the following Table 1 shows the characteristics of the samples used in this study.

TABLE I. DESCRIPTIVE DATA ANALYSIS RESULTS

	ROA	ROE	NPM	INF	RETURN
Mean	0.04969	0.05821	0.03206	0.05421	0.09493
Median	0.02321	0.04964	0.03097	0.06382	0.00232
Maximum	0.71602	0.82941	0.17481	0.06965	1.85366
Minimum	-0.13401	-1.24115	-0.45177	0.03530	-0.78125
Std. Dev.	0.11058	0.22194	0.09609	0.01459	0.48917
Obs.	60	60	60	60	60

Source: Secondary data processed

With the size of the deviation of data shows the high data fluctuations in variable ROA, ROE, NPM, inflation and stock returns during the observation period in the study.

B. Research Results

1) *Classical assumption test*: The classic assumption test is a test conducted to ensure that the research data does not experience interference so that the data is feasible to test the feasibility of a regression model used.

a) *Multicollinearity test*: Multicollinearity test is used to test the regression model to find whether there are any similarities or strong correlations between independent variables. A regression model is declared free from multicollinearity if it has a VIF value produced between 1-10 and a tolerance value of more than 0.10 [13].

TABLE II. VARIANCE INFLATION FACTORS

Variable	Coefficient Variance	Uncentered VIF	Cantered VIF
C	0.069136	16.96541	NA
ROA	0.915506	3.256442	2.701565
ROE	0.601144	7.645105	7.145205
NPM	2.145389	5.321946	4.780598
INF	20.75839	16.03985	1.067487

Source: Secondary data processed

Based on table 2, it is obtained that all independent variables have a VIF value below the number 10, so that the data in this model does not have multicollinearity.

b) *Heteroscedasticity test*: Heteroscedasticity test is used to test whether in the regression model there is an

unequal variance from the residuals of one observation to another observation.

TABLE III. HETEROSKEDASTICITY

Obs*R-squared	Prob. Chi-Square(4)
1.053220	0.9016

Source: Secondary data processed

From table 3 above the p value is shown by the Prob value. chi square (4) on Obs * R-Squared which is 0.9016. Because the p value is $0.9016 > 0.05$, H_0 is accepted. If the value of p value is indicated by the value of Prob. chi square on Obs * R-Squared is greater than 0.05, the regression does not occur heteroscedasticity [15].

c) *Autocorrelation test*: Autocorrelation test to determine whether there is a correlation between the confounding variable at a certain period with the previous variable.

TABLE IV. DURBIN-WATSON TEST

Variables	Observations	Durbin-Watson stat
4	60	2.10476

Source: Secondary data processed

Based on table 4 above the durbin-watson test value = 2.10476, the value is then compared with the durbin-watson table. In the regression model it is known that the number of observations ($N = 60$) and the number of independent variables ($K = 4$) are obtained in the Durbin-Watson table the value of $dL = 1.443$ and the value of $dU = 1.7274$. Then the value of the Durbin-Watson test can be calculated as follows:

$$dU < d < 4-dU$$

$$1.7274 < \mathbf{2.10476} < 4-1.7274$$

$$1.7274 < \mathbf{2.10476} < 2.2726$$

The calculation results above, the Durbin-Watson value is not rejected, which means there is no positive or negative autocorrelation.

2) *Panel data regression analysis*: The analysis of this study was conducted using panel data regression analysis. Panel data regression is a combination of cross section data and time series data. This analysis is used to determine the magnitude of the influence of the independent variable namely profitability which is proxied by ROA, ROE, NPM and inflation as moderating the dependent variable, namely stock returns. This study uses moderated regression analysis (MRA) which in calculating the equation contains elements of interaction or multiplication.

a) *Common effect model*: Common effect model is a model that can produce the same intercept and slope for each individual. So this model assumes that there are no differences in characteristics between individuals [16].

TABLE V. COMMON EFFECT MODEL

R-squared	Adjusted R-squared	Prob.			
		ROA	ROE	NPM	INF
0.254229	0.153836	0.0413	0.0025	0.1532	0.2094

Source: Secondary data processed

Based on table 5, it can be seen the value of adjusted R-squared common effect model = 0.153836. ROA and ROE variables that are moderated by inflation have a significant effect on stock returns. This can be seen from the probability value of ROA of 0.0413 and ROE of 0.0025 whose value is smaller 0.05.

b) *Fixed effect model*: Fixed effect model is a model that pays attention to individual heterogeneity using the help of dummy variables. Fixed effect is based on differences in intercepts between companies but the intercepts are the same over time [16].

TABLE VI. FIXED EFFECT MODEL

R-squared	Adjusted R-squared	Prob.			
		ROA	ROE	NPM	INF
0.443292	0.198884	0.0768	0.0012	0.0713	0.1180

Source: Secondary data processed

Based on Table 6, the value of adjusted R-squared fixed effect regression model is 0.198884, meaning the R-squared value is higher than the value of the common effect model. ROE variable moderated by inflation variable has a significant effect on stock returns, because the probability value of ROE is 0.0012 whose value is smaller than the level of significance (= 0.05).

c) *Random effect model*: Random effect model is a model by considering random conditions between averages and individual characteristics that are random [16]. The random effect model aims to overcome the weaknesses of fixed effects which include dummy variables in the fixed effect model.

TABLE VII. RANDOM EFFECT MODEL

R-squared	Adjusted R-squared	Prob.			
		ROA	ROE	NPM	INF
0.262480	0.163198	0.0372	0.0020	0.1557	0.1669

Source: Secondary data processed

Based on Table 7, the value of the adjusted R-squared random effect model is 0.163198 meaning that the value is lower than the fixed effect model. The variable ROA and ROE moderated by the inflation variable have a significant effect on stock returns, because the probability value of ROA is 0.0372 and ROE of 0.0020 whose value is smaller than the level of significance (= 0.05).

d) *Test chow*: Chow test is used to determine whether panel data regression techniques with fixed effects are better than common effects. Hypothesis criteria to determine the assessment of the chow test are the results that show if both Ftest and Chi-square with p-value > 0.05 then H_0 is accepted and if p-value < 0.05 then H_0 is rejected [16].

TABLE VIII. CHOW TEST RESULTS

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.265818	(11,41)	0.2779
Cross-section Chi-square	17.542703	11	0.0928

Source: Secondary data processed

Based on Table 8, shows that the Chi-square Cross-section probability value is 0.0928 > 0.05. This means that H_0 is accepted and H_1 is rejected, so the estimation of the regression model uses the common effect model.

e) *Lagrange multiplier test*: Lagrange multiplier test is conducted with the aim to determine the best method in panel data regression, whether to use the common effect or random effect.

TABLE IX. LAGRANGE MULTIPLIER TEST

Desc.	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	0.011107 (0.9161)	0.176110 (0.6747)	0.187217 (0.6652)

Source: Secondary data processed

The p-value is indicated by a figure of 0.9161 where the value is above 0.05. So lagrange multiplier test shows that accepting H_0 , which means the best estimation method is to use the common effect.

3) *Hypothesis test*: A research needs to be done to test the hypothesis whether there is an influence or not simultaneously or partially between the independent and dependent variables. In this study to test the hypothesis using the simultaneous significance test (F test) / model test and the significance of individual parameters (partial t test).

a) *Simultaneous test (F test) / model test*: The results of the F statistical test are used to see the effect simultaneously or together between independent variables on the dependent variable.

TABLE X. SIMULTANEOUS SIGNIFICANCE TEST (TEST F)

F-statistic	Prob(F-statistic)	Adjusted R-squared
2.532352	0.025495	0.153836

Source: Secondary data processed

Based on table 10, the F probability value is 0.025495. Because the probability value F is smaller than 0.05, the regression model is feasible to use for estimation. Sujarweni states that if the significance probability value < 0.05 then H_0 is rejected and H_1 is accepted, which means that the independent variable simultaneously influences the dependent variable [13]. The results of the table are the results of the F test with a probability value of F of 0.025495 < 0.05, then simultaneously that ROA, ROE and NPM moderated by inflation have a significant effect on stock returns.

b) *Coefficient of determination (R²)*: Coefficient of determination (R²) which means to measure how far the model's ability to explain the variation of the dependent variable. Rusli states that R square is a comparison between

the variations of Y explained by X1 and X2 together compared to the total variation of Y [17]. Based on table 10 that the calculation results obtained an Adjusted R-squared value of 0.153836 which means that the magnitude of the effect of the independent variable moderated by inflation on the dependent variable that can be explained by this equation model is 15.38%. This shows that the influence of the variable ROA, ROE and NPM moderated by inflation on stock returns that can be explained by this equation model is 15.38%. While the remaining 84.62% is influenced by other factors not taken into account in this regression model, such as political factors, changes in currency rates, macroeconomic factors of the country and so forth.

c) *Partial test (t test)*: Partial Test (t test) is used to determine the effect of each independent variable on the dependent variable, which is between profitability moderated by inflation on stock returns.

TABLE XI. PARTIAL TEST (T TEST)

Variable	t-Statistic	Prob.
C	1.173367	0.2460
ROA	2.092585	0.0413
ROE	-3.175162	0.0025
NPM	1.449609	0.1532
INF	-1.271084	0.2094
ROA_INF	-2.155102	0.0358
ROE_INF	3.365104	0.0014
NPM_INF	-1.687415	0.0975

Source: Secondary data processed

- H1: Effect of ROA on Stock Returns

The first hypothesis proposed states that ROA has a positive effect on stock returns. Based on table 11 above, obtained a t_{count} of 2.092585 with a probability value of 0.0413. While the value of t_{table} obtained 2.005 with $df = nk-1 = 60-5-1 = 54$. The value of t_{count} is greater than t_{table} of $2.092585 > 2.005$ and the probability value is smaller than α of $0.0413 < 0.05$ then H1 is accepted ROA has a positive and significant effect on stock returns.

- H2: Effect of ROE on Stock Returns

The second hypothesis proposed states that ROE has a positive effect on stock returns. Based on table 11 above, we obtained a t_{count} of -3.175162 with a probability value of 0.0025. The value of t_{count} is smaller than t_{table} that is $-4.692248 < 2.005$ and the probability value is smaller than α that is $0.0025 < 0.05$ then H2 is rejected, ROE has a negative effect on stock returns.

- H3: Effect of NPM on Stock Returns

The third hypothesis proposed states that NPM has a positive effect on stock returns. Based on table 11 above, obtained a t_{count} of 1.449609 with a probability value of 0.1532. The value of t_{count} is smaller than t_{table}

of $1.449609 < 2.005$ and the probability value is greater than α of $0.1532 > 0.05$ then H3 is rejected, NPM has no significant effect on stock returns.

- H4: Inflation moderates ROA on Stock Returns

The fourth hypothesis proposed states that inflation moderates ROA on stock returns. Based on table 11 above, obtained t_{count} ROA_INF (b3) of -2.155102 with a probability value of 0.0358. The value of t_{count} is smaller than t_{table} that is $-2.155102 < 2.005$ and the probability value is smaller than α that is $0.0358 < 0.05$. ROA value (b1) is smaller than α that is $0.0413 < 0.05$ means ROA (b1) is significant, and INF value (b2) is greater than α that is $0.2094 > 0.05$ which means that INF is not significant while ROA_INF (b3) is significant, so the moderation type the ROA is pure moderation. Solimun et al [18] states that the existence of a pure moderation variable is only a moderating variable and does not act as an explanatory/predictor variable. H4 is accepted, inflation negatively moderates ROA on stock returns.

- H5: Inflation moderates ROE on Stock Returns

The fifth hypothesis proposed states that inflation moderates ROE on stock returns. Based on table 11 above, obtained t_{count} ROE_INF (b3) of 3.365104 with a probability value of 0.0014. T_{count} value is greater than the t_{table} that is $3.365104 > 2.005$ and the probability value is smaller than α that is $0.0014 < 0.05$. ROE value (b1) is smaller than α that is $0.0025 < 0.05$ means ROE (b1) is significant, INF value is greater than α that is $0.2094 > 0.05$ which means that INF (b2) is **not significant while ROE_INF (b3) is significant, so the moderation type is pure moderation**. H5 is accepted, inflation moderates ROE positively to stock returns.

- H6: Inflation moderates NPM on Stock Returns

The sixth hypothesis proposed states that inflation moderates NPM on stock returns. Based on table 11 above, obtained t_{count} NPM_INF (b3) of -1.687415 with a probability value of 0.0975. T_{count} value is greater than the t_{table} that is $-1.687415 < 2.005$ and the probability value is greater than α that is $0.0975 > 0.05$. NPM value (b1) is greater than α that is $0.1532 > 0.05$ means that NPM (b1) is not significant, INF value (b2) is greater than α that is $0.2094 > 0.05$ which means that INF (b2) is not significant while NPM_INF (b3) is not significant, then this type of moderation is a potential moderation (homologiser moderation), does not function as a moderating variable and also does not act as an explanatory variable. H6 is rejected, inflation does not moderate NPM on stock returns.

4) *Moderated Regression Analysis (MRA)*: Moderate Regression Analysis (MRA) is used to test moderating variables using the interaction test. Moderation variable is an independent variable that will strengthen or weaken the relationship of the independent variable to the dependent variable [19].

TABLE XII. MODERATE REGRESSION ANALYSIS

Variable	Coefficient	Std. Error
C	0.348710	0.297187
ROA	14.09150	6.734015
ROE	-13.89602	4.376476
NPM	9.763212	6.735065
INF	-6.661109	5.240495
ROA_INF	-385.5264	178.8901
ROE_INF	366.8158	109.0058
NPM_INF	-198.8080	117.8181

Source: Secondary data processed

Based on panel data regression testing in table 12 obtained values at the output after inputting into the panel data regression equation are as follows:

$$\text{Stock return} = \text{Stock Returns} = 0.348710 + 14.09150 \text{ ROA} - 3.89602 \text{ ROE} + 9.763212 \text{ NPM} - 6.661109 \text{ INF} - 385.5264 \text{ ROA_INF} + 366.8158 \text{ ROE_INF} - 198.8080 \text{ NPM_INF} + 0.297187 \text{ eit}$$

The constant value (α) of 0.348710 indicates that if there is no change in the independent variable the value is constant of 0.348710.

C. Discussion

1) *Effect of ROA on stock returns:* Based on the results of panel data regression testing shows the first hypothesis is accepted that the ROA variable has a significant effect on stock returns in a positive direction. The results of this study indicate that the signaling theory has been used by investors in investing shares in companies. This is evident that the calculation of ROA is used by investors to measure the ability of corporate assets in generating future profits. The results of this test support the results of previous studies which states that the ROA variable positively influences stock returns [20-22].

2) *Effect of ROE on stock returns:* Based on the results of panel data regression testing shows the second hypothesis is rejected, namely the ROE variable has a significant effect on stock returns in a negative direction. Companies that increase their capital by reserving company profits rather than dividing profits into shareholders, investors respond negatively to the additional capital from the profit reserves. The results of this test support the study of Mulya and Turisna [23] and Aryanti and Andesta [24] which states that ROE has a negative and significant effect on stock returns.

3) *Effect of NPM on stock returns:* Based on the panel data regression test results, the third hypothesis is rejected, namely the NPM variable has no significant effect on stock returns in a positive direction. The company increases sales with high sales promos at the end of the year, the profit of the year rises, but the costs incurred for the promo are charged the following year, so that investors are not affected by the large sales results, because profits fall next year. The results of this test support the research of Safitri and Yulianto [25] and

Simanjuntak et al [26] which states that NPM has no effect and is not significant on stock returns.

4) *Inflation moderates ROA on Stock returns:* Based on the panel data regression test results, the fourth hypothesis is accepted, namely the ROA variable moderated by inflation has a significant effect on stock returns in a negative direction. The results of this test mean that ROA moderated by inflation has a significant negative effect on stock returns. The results of this test support the research results of Khan et al [21] and the study of Haryani and Priantinah [27] which states that the inflation variable has a significant negative impact.

5) *Inflation moderates ROE on stock returns:* Based on the panel data regression test results, the fifth hypothesis is accepted, namely the ROE variable moderated by inflation has a significant effect on stock returns in a positive direction. The results of this test indicate that ROE moderated by inflation has a significant positive effect on stock returns. Inflation rises, the company tries as efficiently as possible to manage its own capital in increasing company profits so that ROE becomes up. An increase in inflation will strengthen ROE on stock returns. The results of this test support the results of research conducted by Adisetiawan which states that inflation has a positive effect on stock mutual fund returns [28].

6) *Inflation moderates NPM on stock returns:* Based on the panel data regression test results, the sixth hypothesis was rejected, namely the NPM variable moderated by inflation had no significant effect on stock returns in a negative direction. The company makes a profit from the sale is not affected by rising inflation or decreasing inflation, so that stock returns owned by investors are not affected by inflation. The results of this study indicate that if inflation rises will not strengthen NPM on stock returns, and the value of inflation will not weaken NPM on stock returns. The results of this test support the research results of Gumilang et al which states that partially, inflation does not have a significant effect on stock returns [29].

V. CONCLUSION AND SUGGESTIONS

A. Conclusion

The results of hypothesis testing using panel data regression can be concluded:

- ROA has a significant positive effect on stock returns.
- ROE has a negative effect on stock returns.
- NPM has no effect on stock returns.
- ROA moderated by inflation has a negative effect on stock returns.
- ROE moderated by inflation has a significant positive effect on stock returns.
- NPM which is moderated by inflation does not affect stock returns.

B. Suggestions

Suggestions that the author can give in connection with the results of research that has been done are as follows:

- As a material for consideration in making future policies aimed at providing relevant information to stakeholders and potential investors.
- Investors should make decisions not only to rely on internal financial data of the company but also need to pay attention to external factors such as (inflation, political conditions, changes in currency rates, economic policies and others) that can affect stock returns.

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