Factors Influencing Stock Prices with Inflation as Moderating Variable

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Submitted: June 2022, Revised: November 2022, Accepted: February 2023

ABSTRACT
The purpose of this research is for specifying the impact of profitability ratio also solvency ratio on stock prices in manufacturing businesses registered under Indonesia Stock Exchange in 2018-2020 with inflation as moderating variable. The analysis used a method named, purposive sampling for the sample selection, and it was found that there were 72 samples of companies that could be used in the study. The data is processed with the help of the Microsoft Excel 2019 and EViews version 12 application program. The outcome from this research shows profitability ratio with the Return on Assets proxy, solvency ratio with the Debt-to-Equity Ratio proxy, and inflation have a positive also significant impact on the stock prices. Meanwhile, profitability ratio with Return on Equity proxy showed a negative as well as significant impact on the stock prices. Moreover, inflation is known to moderate the effect of profitability ratio for the Return on Assets proxy, profitability ratio for the Return on Equity proxy, and solvency ratio with Debt-to-Equity Ratio proxy to the stock prices.

Keywords: Profitability ratio, solvency ratio, inflation, stock prices

1. INTRODUCTION

Based on the news obtained from [1], the manufacturing industry is encouraged to make more breakthroughs because the sector contributes to realizing Indonesia's vision as a developed and prosperous country. Making breakthroughs is a positive thing for the company in controlling market share. However, the company needs some funds to make it happen. There are several ways to get funds, one of which is through the capital market. Companies can enter the capital market by selling their shares and listing their shares on the Indonesia Stock Exchange. Enterprises that have listed and sold their stocks on the Indonesia Stock Exchange may later be purchased by investors.

Before buying shares from a company, investors will consider various things first. Based on [2], it is recommended in stock transactions to conduct analysis with the aim of minimizing risk. An investor will study information and conduct analysis in the form of analytical processing such as fundamentals, where this analysis is carried out by looking at its financial performance as measured by financial ratios as well as ratios of liquidity, solvability, also profitability [3]. In addition to the ratios contained in the financial statements, movements that occur in the macroeconomy can also affect the stock price of a company. Therefore, an analysis of the macroeconomy also needs to be done by investors before buying shares of a company. The information obtained by the investors will be used to decide the investing conclusion in the capital market.

According to the description stated above, the analysis here attempts to answer several problems: (1) Does Return on Assets impact stock prices in manufacturing companies?; (2) Does Return on Equity impact stock prices in manufacturing companies?; (3) Does the Debt to Equity Ratio impact stock prices in manufacturing companies?; (4) Does inflation impact stock prices in manufacturing companies?; (5) Can inflation moderate impact from Return on Assets to the stock prices in manufacturing companies?; (6) Can inflation moderate the impact from Return on Equity to the stock prices in manufacturing companies?; and (7) Can inflation moderate impact from the Debt to Equity Ratio to the stock prices in manufacturing companies?
1.1. Our Contribution

By doing this research, it is hoped that it can provide several benefits. The benefits that can be provided include: (1) For readers, it is hoped that they can add insight and knowledge about information that can affect the company's stock price; (2) For company managers, it is hoped that the results of this research can be considered in managing the performance of the company's financial statements, especially those related to profitability ratios and solvency ratios; (3) For investors, it is hoped that the results of this research can be considered in conducting analysis before buying shares of a company; and (4) For further researchers, it is hoped that the outcome from this analysis can guide them in conducting their research.

1.2. Paper Structure

The remains of this paper will be set into several sections. The second section will explain the background of this research, such as theories and research hypotheses. The third section presents about methods used for the analysis. Then, findings and discussions from the analysis will be described in the fourth section. The last section illustrates the conclusions of this paper.

2. BACKGROUND

2.1. Theories

2.1.1. Signaling Theory

According to [4], signaling theory is formed by a set of key elements that follow a logical sequence consisting of a signaler, signal, receiver, and feedback. The main assumption regarding signaling theory is that management has accurate information about the value of the company where outside investors do not know the information, so that management who acts as a signaler will provide a signal in the form of company information. The signal is addressed to investors as signal recipients. Signals in the form of company information provided to investors are carried out to assist investors in making their decisions.

2.1.2. Agency Theory

In an agency relationship, one party, known as the principal will delegate tasks or activities to another party, known as the agent. Explicitly, agency theory discusses where the contractual arrangement of the relationship between the principal also agent can operate most efficiently. The idea of a contract is used as a metaphor to describe agency relationships [5]. Agency theory explains that agency relationships occur when one party (principal) hires another party (agent) to carry out a service wherein its implementation, the agent will act on behalf of the principal. The principal referred to here is the shareholders while the agent is the management of the company.

According to [6], agency problems can arise if the following two conditions are met simultaneously: (1) Disagreement in concerns among principal as well as agent; also (2) The existence of asymmetric information. Information asymmetry occurs when one party has more information than the other (and the other party is aware of this fact) about the uncertain outcome of the production process either before agreeing to a contract or during its execution.

2.1.3. Stock Prices.

According to [2], stock prices are determined based on the law of supply and demand. The more people who want to buy their shares, the more the company's stock price can increase. However, the stock price of a company can decrease if many people want to sell their shares. In the long term, the stock prices movement in each company will generally move to one direction together with performance generated by the company.
2.1.4. Profitability Ratio

According to [7], the ratio of profitability may show the outline about a company to obtain benefits from certain levels in their selling, assets, as well as share capital. The profitability ratios that will be used in the research are Return on Assets also Return on Equity. The Return on Assets (ROA) is a ratio that measures how effectively assets are used to generate returns, while Return on Common Equity (ROE) can determine the rate of return on funds invested by shareholders in the company [8].

2.1.5. Solvency Ratio

Based on [7], the solvency ratio can provide information about the capability of a company in meeting the long period of time obligations. The solvency ratio that will be applied for the research here is Debt to Equity Ratio. The Debt-to-Equity Ratio can be used to assess the comparison between debt and equity.

2.1.6. Inflation

Based on [9], inflation is the rise of prices which occurs in general, where this happens continuously for a group of goods. The high rate of inflation will hamper investment productivity, due to high uncertainty. In addition, high inflation rates can also hamper economic growth in the long term.

2.2. Research Hypotheses

2.2.1. The Relationship between Profitability Ratios and Stock Prices

The profitability ratios of a company can show the performance of the company's management. The greater the profitability ratio indicates that the profit earned by a company is also getting bigger. This shows about the performance of the company which considered to be better and may escalate company’s grade. Therefore, profitability ratio can be considered by investors in making their decisions. If the company experiences an increase in its profitability ratios, investors can be interested in buying their shares, which later may rise the company's stock price.

Research conducted by [3] yields different conclusions regarding the impact from profitability ratios to stock prices. It was concluded, profitability ratio with the Return on Assets proxy had significant positive impact on stock prices, while profitability ratios with Return on Equity proxy had no significant impact on stock prices.

2.2.2. The Relationship between Solvency Ratios and Stock Prices.

The solvency ratio with Debt-to-Equity Ratio proxy can convey about composition of using their own funding or take advantage of its debts in carrying out company operations. The greater the Debt-to-Equity Ratio, danger that will be faced will also be greater too. So, the larger the Debt-to-Equity Ratio, there will be more worried investors. So, the stock price may decline.

According from [10] research outcome, it shows partially the ratio of solvency significantly impacts the stock prices. However [3] concluded that the results of his research stated ratio of solvency did not gives a significant impact on the stock prices.

2.2.3. The Relationship between Inflation and Stock Prices

The rises in inflation rate have a tendency to cause cost of goods to increase and economic growth will also tend to be bad. Therefore, investors may become less interested in buying shares for a while when there is a rise in the inflation rate. Thus, the company stock price will also decrease. Impact from inflation to the stock prices according to research done by [11] concluded that the inflation rate affects changes in stock prices negatively and significantly. While research [12] has results where inflation gives a positive as well as significant impact to the stock prices.

https://doi.org/10.24912/ijaeb.11.427-435
2.2.4. The Relationship between Profitability Ratios and Stock Prices with Inflation as Moderating Variables.

Inflation causes the price of goods to increase. This can result in a decrease in the number of buyers. In addition, the cost of raw materials that need to be issued by the company will increase. With reduced purchasing power and increased costs of raw materials issued by the company, later it may influence the income of the company, which as well as affecting profitability ratio of the company also ultimately affecting company stock price.

Based from the research conducted by [3], it is known that inflation in moderating the impact from profitability ratios to the stock prices when using different proxies produces different conclusions. The results of his research stated that inflation could not moderate the impact from profitability ratio with the Return on Assets proxy on stock prices. However, inflation can weaken the effect of profitability ratios with the Return on Equity proxy on stock prices.

2.2.5. The Relationship between Solvency Ratios and Stock Prices with Inflation as Moderating Variables

Bank Indonesia will raise the BI Rate interest rate when there is an increase in inflation. This is done with the aim of putting the brakes on the movement of the economy which is moving too fast. So, in the end, it can reduce inflationary pressure [9]. With the increase in interest rates, the amount of interest derived from the company's debt will also increase. Thus, the company must provide and spend additional money to pay it off. This research will use the solvency ratio with the Debt to Equity Ratio proxy. Therefore, if the company mostly runs the company's operations using debt, the amount of interest that must be paid by the company will also be greater, especially when inflation occurs. So, this can affect the decisions of people in investing, also later, stock price of the company tends to be affected.

Based on research conducted by [13], concluding that inflation moderates the effect of solvency and stock prices. Meanwhile, according to research conducted by [3], inflation is known to be unable to moderate the solvency ratio to stock prices.

The following image is an outline of the framework that will be used in this study:

![Figure 1 Framework](https://doi.org/10.24912/ijaeb.11.427-435)

From the framework above, the hypotheses development are as follows:

- **H1**: Return on Assets has a positive and significant impact on stock prices.
- **H2**: Return on Equity has a positive and significant impact on stock prices.
- **H3**: Debt to Equity Ratio has a negative and significant impact on stock prices.
- **H4**: Inflation has a negative and significant impact on stock prices.
- **H5**: Inflation can moderate the impact of Return on Assets on stock prices.
- **H6**: Inflation can moderate the impact of Return on Equity on stock prices.
- **H7**: Inflation can moderate the impact of Debt-to-Equity Ratio on stock prices.
3. METHODS

Research design here uses a descriptive quantitative method approach. This research uses secondary data as a data source, namely financial reports which were issued on Indonesia Stock Exchange through idx.co.id website or the company's official website and macroeconomic data taken through the bi.go.id website. The tools to analyze the data used were Microsoft Excel 2019 software and EViews 12.

Sample selection was done by using the purposive sampling method. Standard to determine the selection of samples used for the analysis here are (1) Manufacturing companies recorded on Indonesia Stock Exchange from 2018-2020; (2) Manufacturing companies that did not conduct Initial Public Offering in 2018-2020; (3) Manufacturing companies which present audited financial statements sequentially from 2018-2020; (4) Manufacturing companies which provide financial statements in rupiah currency consecutively from 2018-2020; and (5) Manufacturing companies which in their financial statements report profits in a row from 2018-2020. After selecting the sample using the purposive sampling method, it was found that there were 72 samples of companies that could be used in the study.

There are three independent variables in this study consisting of the ratio of profitability by Return on Assets proxy, profitability ratio with Return on Equity proxy, also solvency ratio with Debt-to-Equity Ratio proxy. Inflation is utilized as a moderating variable. While stock price is utilized as a dependent variable for the research here. In this study, stock price was taken from closing stock price at the end of each year. To calculate the profitability ratio with the Return on Assets proxy in this study, the following formula will be used:

\[
\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}}
\]

To calculate the profitability ratio with the Return on Equity proxy in this study, it can be measured using the following formula:

\[
\text{ROE} = \frac{\text{Net Profit}}{\text{Equity}}
\]

For the solvency ratio with the Debt-to-Equity Ratio calculation for the study here, it may use following formula as the measurement:

\[
\text{DER} = \frac{\text{Debt}}{\text{Equity}}
\]

In this study, the inflation rate used is the average inflation rate in each year.

4. FINDINGS AND DISCUSSIONS

4.1. Findings

This study used Fixed Effect Model in estimating the data. Based on [2], the Fixed Effect Model usually processes data using the Panel Least Square (PLS) method without weighting or by applying the Generalized Least Square (GLS) method with weighting. The research here was conducted using the Fixed Effect Model with the Generalized Least Square (GLS): White Cross-Section Weight method. This method is used because Generalized Least Square (GLS): White Cross-Section Weight produces a higher R-squared value when compared to the Panel Least Square (PLS) method without weighting. The following table is the Fixed Effect Model by weighting results:
Table 1 Fixed Effect Model with Weighting Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2870.742</td>
<td>102.9316</td>
<td>27.88980</td>
<td>0.0013</td>
</tr>
<tr>
<td>ROA</td>
<td>141203.5</td>
<td>3304.625</td>
<td>42.72904</td>
<td>0.0005</td>
</tr>
<tr>
<td>ROE</td>
<td>-105333.1</td>
<td>2350.643</td>
<td>-44.81035</td>
<td>0.0005</td>
</tr>
<tr>
<td>DER</td>
<td>2573.032</td>
<td>134.3300</td>
<td>19.15456</td>
<td>0.0027</td>
</tr>
<tr>
<td>INFLATION</td>
<td>27167.84</td>
<td>922.6306</td>
<td>29.44607</td>
<td>0.0012</td>
</tr>
<tr>
<td>ROA_INFLATION</td>
<td>-4291219.</td>
<td>102038.1</td>
<td>-42.05508</td>
<td>0.0006</td>
</tr>
<tr>
<td>ROE_INFLATION</td>
<td>3290430.</td>
<td>87031.32</td>
<td>37.80742</td>
<td>0.0007</td>
</tr>
<tr>
<td>DER_INFLATION</td>
<td>-73213.06</td>
<td>3416.765</td>
<td>-21.42760</td>
<td>0.0022</td>
</tr>
</tbody>
</table>

Effects Specification

Cross-section fixed (dummy variables)

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.989817</td>
<td>Mean dependent var</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.984019</td>
<td>S.D. dependent var</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>2489.444</td>
<td>Sum squared resid</td>
</tr>
<tr>
<td>F-statistic</td>
<td>170.7207</td>
<td>Durbin-Watson stat</td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
</tr>
</tbody>
</table>

Unweighted Statistics

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.941768</td>
<td>Mean dependent var</td>
</tr>
<tr>
<td>Sum-squared residuals</td>
<td>1.06E+09</td>
<td>Durbin-Watson stat</td>
</tr>
</tbody>
</table>

4.1. Partial Test (t-test) Results.

In this test, to determine significance effect of X to Y is known through the number of probabilities. According to Table 1, it is known that the Return on Assets variable obtains a probability amount of 0.0005 that refers to less than 0.05. Therefore, this outcome explains, Return on Assets significantly affects stock prices. For Return on Equity, its probability amount is 0.0005, indicates that it is less than 0.05. Therefore, this result shows that Return on Equity has significant impact on stock prices. Meanwhile, Debt to Equity Ratio variable probability value is 0.0027 which means less than 0.05. Therefore, this result shows, Debt to Equity Ratio significantly impacts stock prices. Inflation variable obtains a probability amount of 0.0012 that refers to less than 0.05. Therefore, this outcome indicates inflation significantly impacts stock prices.

Return on Assets variable with inflation moderation has a probability amount of 0.0006 which refers to less than 0.05. Therefore, this outcome indicates Return on Assets with moderated inflation significantly impacts stock prices. The Return on Equity variable with inflation moderation has a probability amount of 0.0007 which refers to less than 0.05. Therefore, this result indicates that Return on Equity with moderated inflation significantly impacts stock prices. The Debt-to-Equity Ratio variable with inflation moderation probability amount is 0.0022 which refers to less than 0.05. Therefore, this result shows Debt to Equity Ratio with moderated inflation significantly impacts stock prices.

4.1.2. Simultaneous Test (f-test) Results

Simultaneous test is known through Prob (F-statistic) number. According to Table 1, Prob (F-statistics) number for this study is 0.000000. This result indicates that independent variables simultaneously have an impact on dependent variable because Prob (F-statistic) number is far below
0.05. Therefore, it can be concluded that Return on Assets, Return on Equity, Debt-to-Equity Ratio, inflation, Return on Assets with moderated inflation, Return on Equity with moderated inflation, as well as Debt-to-Equity Ratio with moderated inflation simultaneously affect stock prices.

4.1.3. Coefficient of Determination Test (Adjusted $R^2$) Results

This test is known by looking at the numbers on the Adjusted R-squared. According to Table 1, the Adjusted $R^2$ number in this study is 0.984019. This indicates that Return on Assets, Return on Equity, Debt to Equity Ratio, inflation, Return on Assets with moderated inflation, Return on Equity with moderated inflation, as well as Debt to Equity Ratio with moderated inflation show combined impact to the stock prices for around 98%. While the other 2% is affected by other elements beyond this study.

4.2. Discussions

There is positive also significant impact between profitability ratio with the Return on Assets proxy to the stock prices. According from this result, it tells $H_1$ is accepted. It indicates there is positive also significant impact between Return on Assets to the stock prices of manufacturing companies registered on Indonesia Stock Exchange during 2018-2020. The outcome of this analysis is supported by [3], [14], and [13] studies results. However, [15] studies show different conclusions.

Profitability ratio with the Return on Equity proxy shows negative as well as significant impact on stock prices. According to this outcome, can be concluded $H_2$ is rejected because Return on Equity shows negative also significant impact on stock prices of manufacturing companies registered on Indonesia Stock Exchange during 2018-2020. [10] study support this outcome. However, [3], [14], [16], [17], [12], and [18] research concluded different results.

There is a positive also significant impact from solvency ratio with the Debt-to-Equity Ratio proxy to the stock prices. Based from this outcome, $H_3$ is not accepted because there is positive also significant impact from Debt-to-Equity Ratio on stock prices of manufacturing companies registered on Indonesia Stock Exchange during 2018-2020. Studies done by [10], [17], [14], and [15] support the outcome of this research. Meanwhile, studies done by [3], [16], [13], and [18] stated different results.

There is a positive also significant impact between inflation to stock prices. According to the outcome obtained, can be concluded $H_4$ is rejected, because inflation shows positive also significant impact on stock prices of manufacturing companies registered on Indonesia Stock Exchange during 2018-2020. The outcome of this research is supported by the outcome study from [12]. However, the outcomes of [11], [19], [20], [15], [21], and [18] studies, stated different outcomes.

Inflation can moderate the effect of profitability ratio with the Return on Assets proxy to stock prices. According from this outcome, it may be concluded that $H_5$ is accepted. This indicates that inflation can moderate the impact between Return on Assets to stock prices of manufacturing companies registered on Indonesia Stock Exchange for the 2018-2020 period. However, results from research conducted by [3] and [13] stated different results.

Inflation can moderate the effect of profitability ratio with the Return on Equity proxy to stock prices. This outcome tells that $H_6$ is not rejected. This indicates that inflation can moderate impact of Return on Equity to the stock prices from manufacturing companies registered on Indonesia Stock Exchange for the 2018-2020 period. Result from a study conducted by [3] supports this outcome.

Inflation can moderate impact of solvency ratio with Debt-to-Equity Ratio proxy to stock prices. According to the outcomes obtained, it may be concluded that $H_7$ is accepted. It means inflation can moderate the effect of the Debt-to-Equity Ratio on stock prices of manufacturing companies registered on Indonesia Stock Exchange during 2018-2020. This outcome is supported by the outcomes studies of [13]. However, research conducted by [3] concluded different results.

5. CONCLUSIONS

The final results obtained are profitability ratio with Return on Assets proxy, solvency ratio with Debt-to-Equity Ratio proxy, as well as inflation are known to positively and significantly impact stock
prices. Meanwhile, the profitability ratio with Return on Equity proxy is known to negatively as well as significantly impact stock prices. In addition, inflation is known to moderate the effect of profitability ratio with Return on Assets proxy and Return on Equity proxy, also solvency ratio with Debt-to-Equity Ratio proxy to stock prices.

This study outcome is hoped for readers may get some insights and knowledge about information that may be affecting stock price of the company. Meanwhile, company managers may use this study in managing their financial statements performances, mainly for the profitability ratios as well as solvability ratios. On the other hand, investors may take results from this research into consideration when conducting analysis in buying shares of a company. Furthermore, for the next researchers, it is hoped this research outcome may guide them in conducting their research.

However, there are several limitations in this study, namely the number of years used in the study is limited, only three years from 2018 to 2020. Moreover, the independent variables used are limited to two types of ratios, namely profitability ratios and solvency ratios. The sample used in this study was only taken from manufacturing companies. Based on these limitations, the results of this study will be less effective in reflecting market conditions in the long-term period and also in companies outside the manufacturing sector.

Therefore, there are several suggestions for further researchers who will also examine stock prices. First, the number of research periods can be increased to more than three years. Second, the type of ratio used can be expanded by adding liquidity ratios, activity ratios, or market ratios. The last is to expand the sample of companies used by adding other sectors besides manufacturing.

ACKNOWLEDGMENT

This paper was supported by the Faculty of Economics and Business of Universitas Tarumanagara.

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https://doi.org/10.24912/ijaeb.11.427-435


