The Effect of Profitability and Liquidity on Stock Prices with Research and Development Intensity as a Moderating Variable in Food and Beverage Sub-Sector Manufacturing Companies Listed on the IDX for the 2018-2022 Period

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ABSTRACT

The background of this study aims to examine the effect of profitability and liquidity on stock prices by using research and development intensity as a moderating variable in manufacturing companies in the food and beverage industry subsector. Researchers used a sample of companies with several criteria, including companies that publish complete financial reports, include the allocation of research and development activity costs during 2018-2022. Researchers used several methods in this study. First, multiple regression to see the effect of the two independent variables on the dependent variable. Second, using the MRA (Moderated Regression Analysis) method to test the moderation variable. The results of research and data analysis show: 1) Profitability has no effect on Stock Price, 2) Liquidity has a negative effect on Stock Price, 3) Research and Development Intensity does not moderate the effect of Profitability on Stock Price, and 4) Research and Development Intensity moderates the effect of Liquidity on Stock Price. The limitations of this study include: First, this research cannot be assessed for all aspects of business in companies on the IDX, especially the food and beverage industry manufacturing sector. This is because this research is limited by several things, the first is that when the research was conducted, there was an extreme change in conditions in 2020 when the COVID-19 pandemic was sweeping the world, especially Indonesia. Second, information on the amount of funds allocated for research and development is limited, because not all companies record or disclose the funds they allocate for research and development activities.

Keywords: : Stock Price, Profitablity, Liquidity, Research and Development Intensity, Moderation..

1. Introduction

In the era of globalization and increasingly fierce business competition, companies are required to continue to innovate and improve their financial performance to attract investors. Investors must expect a return on investment profits, namely in the form of dividends and capital gains/losses. Therefore, the choice of a company will be important because investors will definitely choose a company with good potential in the future. According to the Ministry of Industry (2023), the food and beverage industry can survive because the industry has good

growth from year to year even though several companies have experienced a decline and according to (Sitorus, 2021) this sector is still considered good in terms of opportunities because considering that food and beverages are one of the needs that are met so that they will continue to grow and develop. The following is the average stock price data of several sub-sector companies in the consumer goods industry in 2019-2022.

Table 1. Average Stock Price of Food and Beverage Industry Companies in 2019-2022

Sub Sector	Average Stock Price per Year (Rp)				Information
	2019	2020	2021	2022	
Food and Baverage	3.537	4.434	2.888	3.028	Fluctuating

From Table 1, it can be seen that the food and beverage industry sub-sector has fluctuated. The lowest value is in 2021 with the average price of the Company having a price of IDR 2,888, while the highest share price is in 2020 with a price of IDR 4,434. Factors that affect the rise and fall of the Company's share price are generally categorized into two, namely internal factors and external factors (Sukartaatmadja et al., 2023). Yudistira and Adiputra (2020) stated that internal factors affect stock prices more than external factors. Therefore, this research will focus on internal or fundamental factors of the company. An internal factor that affects stock prices is financial ratios. The profitability ratio is a ratio that aims to determine the company's ability to generate profits during a certain period and also provides an overview of the level of effectiveness of management in carrying out its operational activities (Darmawan, 2020:103). Good profitability is a good signal for investors because companies can provide a return on their capital and can attract investors to buy shares of the company so that the stock price will increase (Aldini & Andarini, 2018). The results of research from Solichah et al (2021) revealed that the increase in earnings per share have an impact on the development of stock prices. Then, Saprudin (2019) and Dewi and Hidayat (2019) revealed that profitability has a positive influence on stock prices.

Then, liquidity is also considered to have an influence on stock prices. From the results of research conducted by Amrah & Elwisam (2019), it was revealed that too high liquidity indicates poor liquidity management. The results of research from Lutfi & Sunardi (2019) stated that liquidity has a negative effect on stock prices. A high measure of liquidity can describe the company being able to meet its obligations, but if it is too high, it can also be a question mark. If a company's liquidity is above 200% (too liquid), then the company can indicate that the company has a large amount of idle cash. When the company's liquidity is low, it means that the company is in a position of financial difficulties. So that with the general limit of a company with a level of liquidity that is considered safe, it will result in the company being in a promising position for investors.

In addition to Profitability and Liquidity, the variable Research and Development (R&D) Intensity is also considered to have an influence on stock prices. In recent decades, R&D has been recognized as a key element in the company's innovation and long-term sustainability. In research conducted by Jiang, John and Larsen (2018) revealed that R&D intensity has a complex influence on profitability and stock price volatility. On the one hand, high R&D intensity can squeeze short-term profitability but open up opportunities for long-term growth. On the other hand, R&D intensity increases the total and continuous volatility of stocks, while reducing volatility jumps through increased stock liquidity and a reduction in information asymmetry. Then the results of research from Dass, Nanda, and Xiao (2014) mentioned that R&D intensity has a significant impact on profitability and liquidity, which is ultimately reflected in the

company's more stable and increasing stock prices. Innovation measured through R&D intensity will increase stock liquidity by reducing "illiquidity" or difficulty in stock trading, which makes the company's shares more attractive to investors. Then, on the profitability side, companies with high R&D investment are more likely to produce innovative products or services, which can increase the company's profits in the long run. In this study, the researcher seeks to examine the relationship between profitability and liquidity to stock prices in companies engaged in the food and beverage industry. In addition, researchers also wanted to see if R&D intensity moderated the relationship. Moderation variables are used to measure the extent to which R&D intensity can affect the relationship between profitability and liquidity to stock prices. This research will be compiled into two parts, the first part is to analyze the relationship between profitability and liquidity on stock prices. Then the second part is to look at the effects of the role of research and development activities variables in moderating the influence of profitability and liquidity on stock prices.

2. Literature Review

2.1 The Effect of Profitability on Stock Prices

Profitability is the overall amount of net profit that a company is able to achieve. Good profitability is a good signal for investors because companies can provide a return on their capital and can attract investors to buy shares of the company so that the stock price will increase (Aldini & Andarini, 2018). In line with signal theory, when the level of profitability is good, it is a signal that the profit is large. The greater the company's profit, the higher the price the investor assesses. The results of research from Solichah et al (2021), Saprudin (2019) and Dewi and Hidayat (2019) revealed that profitability has a positive influence on stock prices.

H1: Profitability has a positive effect on the Stock Price.

2.2 The Effect of Liquidity on Stock Prices

Rozeff (1982) defines liquidity as how much the cost of liabilities is incurred to finance a company. A high measure of liquidity can describe the company being able to meet its obligations, but if it is too high, it can also be a question mark. If a company's liquidity is above 200% (too liquid), then the company can indicate that the company has a large amount of idle cash. This indicates inefficient cash management. When the company's liquidity is low, it means that the company is in a position of financial difficulties because at some point the company has to pay its short-term debts. So that with the general limit of the company with a level of liquidity that is considered safe, it will result in the company being in a promising position for investors who invest because the company is considered to be able to pay off its current debts (Sukaryasih, et al, 2019). This is supported by the results of research conducted by Amrah & Elwisam (2019) and Lutfi & Sunardi (2019). Where the results of the previous research show that liquidity has a negative effect on stock prices.

H2 : Liquidity has a negative effect on Stock Price.

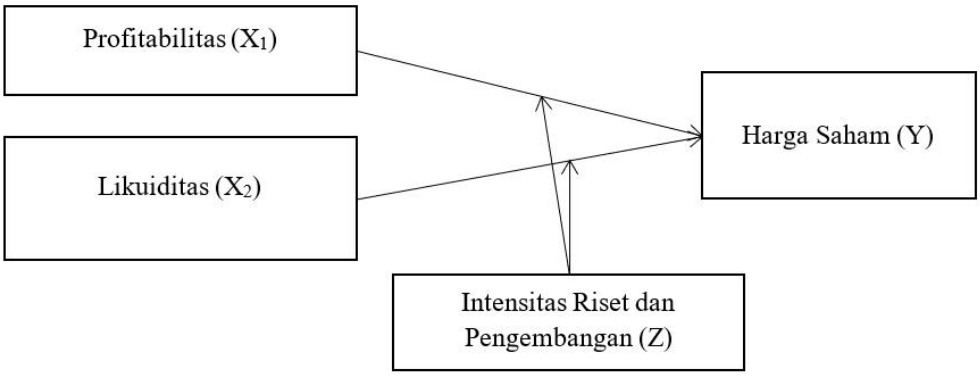
2.3 The Role of Research and Development Intensity in Moderating the Influence of Profitability and Liquidity on Stock Prices

Jiang, John and Larsen (2018) in their research revealed that R&D intensity has a complex influence on profitability and stock price volatility. Then the results of research from Dass, Nanda, and Xiao (2014) stated that R&D intensity has a significant impact on profitability and

liquidity, which is ultimately reflected in the company's more stable and increasing stock prices. When the company can make products that are in accordance with what is desired and sell, it will increase the Company's profits and also the Company's liquidity will be smooth. This is a signal for investors so that the Company's share price will increase. Research and Development is important to continue to develop pre-existing products into new products and have their own advantages in order to dominate the market. This is a factor that R&D intensity is considered as a moderation variable for profitability and liquidity to the stock price of food and beverage companies.

H3 : Research and Development Intensity moderates the Effect of Profitability on Stock Prices

H4 : Research and Development Intensity moderates the Effect of Liquidity on Stock Prices



Gambar 1. Model Penelitian

3. Research Methodology

3.1 Research Design

The independent variables in this study are Profitability and Liquidity, while the bound variable is the Stock Price. Then, the moderation variable in this study is Research and Development Intensity. For independent variable hypothesis testing as well as moderation testing, the author uses data from manufacturing companies in the food and beverage sub-sector listed on the Indonesia Stock Exchange during the period 2018-2022. Researcher analyze the relationship dependent variable and independent variable using the multiple regression models. Then the second part is to see the effect of the role of moderating variables in this study using the MRA (Moderated Regression Analysis) method.

3.2 Sample

The researcher used a sample of companies with several criteria, including manufacturing companies in the food and beverage sub-sector that published complete financial statements during the 2018-2022 period and included the allocation of research and development activity costs. The company's financial statement data is accessed through the www.idx.co.id website as well as from the official website of the related company.

3.3 Variable Measurement

For the dependent variable, namely the stock price, the author uses the closing stock price variable. To measure the closing stock price, the method used by the author refers to Darmadji and Fakhrudin (2012; 102) that is, the share price used is the closing price of the transaction. Then, for the independent variable, namely profitability, the author uses the return on asset (ROA) variable, which is measured by comparing the company's net income with the company's total assets, Syamsuddin (2009:63). Then for the second independent variable, namely liquidity, the author uses the current ratio (CR) variable, which is measured by comparing current assets with current liabilities, Harahap (2002). Then for the measurement of moderation variables, namely research and development intensity, using a method of comparing funds spent on research and development activities to the company's total assets (Lu et.al, 2011).

3.4 Data Analysis

In this study, the researcher will analyze the relationship between profitability and liquidity on stock prices using the multiple regression method. Then the second part is to look at the effect of the role of research and development activity variables in moderating the influence of profitability and liquidity on stock prices using the MRA (Moderated Regression Analysis) method.

4. Results

4.1 Descriptive Analysis

The data available in this study is data on manufacturing companies in the food and beverage industry sub-sector in 2018-2022 from each company for a period of 5 (five) years. The sampling process produced 4 companies with 20 observations for the research period from 2018 to 2022. The description of the research data consists of Return on Asset, Current Ratio (CR), Research and Development Intensity and Closing Price. The results in statistical descriptive form will display the characteristics of the sample used in the study, including the number of samples (N), the average sample (mean), minimum and maximum and standard deviation (σ) for each variable, which is presented in the table below.

Table 1. Variable Descriptive Analysis.

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	20	.03	12.20	7.1505	3.63917
CR	20	1.18	6.81	3.0439	1.45657
RDI	20	.0000098	.0033694	.001342673	.0010762957
Harga_Saham	20	181.00	2710.00	1289.6000	821.72754
Valid N (listwise)	20				

In table 1. It can be noted that the average Return on Asset (ROA) of manufacturing companies in the food and beverage industry sub-sector in 2018-2022 is 7.1505. The company with the highest ROA score was HOKI in 2018 with a value of 12.20. Meanwhile, the company with the lowest ROA value is the HOKI company which occurred in 2022 with an ROA of 0.03. Then, the average value of the Current Ratio (CR) variable of manufacturing companies in the food and beverage industry sub-sector in 2018-2022 is 3.0439. The company with the highest CR score is HOKI in 2022 with a value of 6.80. Meanwhile, the company with the lowest CR value is the GOOD company that occurred in 2018 with a CR of 1.18. Then, the average value of the Research and Development Intensity (RDI) variable of manufacturing companies in the food and beverage industry sub-sector in 2018-2022 is 0.001342673. The company with the highest RDI score was GOOD in 2019 with a value of 0.0033694. Meanwhile, the company with the lowest RDI value is the HOKI company which occurred in 2018 of 0.0000098. Finally, the average value of the stock price variable of manufacturing companies in the food and beverage industry sub-sector in 2018-2022 is 1289.6. The company that has the highest share price is MYOR in 2020 with a value of 2710. Meanwhile, the company with the lowest share price is the HOKI company which occurred in 2021 with a price of 181.

4.2 Statistic Analysis

4.2.1 Multiple Regression Test Analysis

Multiple linear regression analysis is used to estimate the influence of two or more independent variables (X) on a bound variable (Y) or to prove that there is or is not a relationship between two or more independent variables and a bound variable. Multiple linear regression analysis can be seen in Table 2.

Table 2. Simultaneous Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.858	3	3.286	10.703	.000[b]
	Residual	4.912	16	.307		
	Total	14.770	19			

a. Dependent Variable: Harga_Saham

b. Predictors: (Constant), RDI, ROA, CR

The table above shows that the calculated F value obtained is a significance level of 0.000, which is smaller than the significant level α 0.05 or (0.000<0.05). The F value is calculated to be greater than the F value of the table, so it is concluded that together ROA (X1), CR (X2) and RDI (Z) have a simultaneous and significant effect on the stock price of manufacturing companies in the food and beverage industry sub-sector in 2018-2022 listed in the BEI.

For a partial hypothesis test, this study uses the T test, which can be seen in table 3 below:

Table 3. Results of Partial Hypothesis Test

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.219	.574		12.567	.000
	ROA	.074	.047	.304	1.555	.138
	CR	-.287	.118	-.474	-2.420	.027

a. Dependent Variable: Harga_Saham

From table 3, a multiple regression equation is obtained, namely: Y = 7.219 + 0.074X1 - 0.287X2 + e. Then from the results of the test, it can be seen that the level of significance in the ROA variable = 0.138 (sig>0.05), and has a value (0.074). From these results, it can be concluded that the ROA variable has no effect on the Stock Price. The first hypothesis that reveals that Profitability has a positive effect on the Stock Price, is **rejected**.

Then, the significance level of the CR variable = 0.027 (sig<0.05), and has a value (-0.287). From these results, it can be concluded that the CR variable has a negative effect on the Stock Price. The second hypothesis that reveals that Liquidity has a negative effect on the Stock Price is **accepted.**

4.3 Moderation Variable Test Analysis

The next step, the researcher wants to analyze the moderation variable. In this case, the researcher will analyze using an interaction test (Moderated Regression Analysis). The test method is carried out by multiplying the free variable by the moderation variable by including 3 equations as follows:

1. Regression Equation I, regresses independent variables to dependent variables.
   Y = 7.219 + 0.074X1t - 0.287X2t + e.

Table 4. Results of Multiple Regression Equations X1 and X2

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.219	.574		12.567	.000
	ROA	.074	.047	.304	1.555	.138
	CR	-.287	.118	-.474	-2.420	.027

a. Dependent Variable: Harga_Saham

2. Regression Equation II, regresses independent variables by including moderation variables to dependent variables.
   Y = 6.154 + 0.035X1 - 0.086X2 + 545.369Z + e

Table 5. Results of Multiple Regression Equations X1, X2 and Z

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	6.154	.523		11.771	.000
	ROA	.035	.037	.143	.927	.368
	CR	-.086	.105	-.142	-.817	.426
	RDI	545.369	148.089	.666	3.683	.002

a. Dependent Variable: Harga_Saham

3. Regression Equation III regresses independent variables, moderation variables and interaction variables to dependent variables.
   $Y = 6.438 + 0.054X1 - 0.208X2 + 249.661Z – 47.483ZX1 + 265.721ZX2 + e$

Table 6. Results of Multiple Regression Equations X1, X2, Z, ZX1 and ZX2

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	6.438	.625		10.295	.000
	ROA	.054	.040	.223	1.354	.197
	CR	-.208	.114	-.344	-1.832	.088
	RDI	249.661	484.531	.305	.515	.614
	ROAxRDI	-47.483	41.191	-.579	-1.153	.268
	CRxRDI	265.721	95.307	.870	2.788	.015

a. Dependent Variable: Harga_Saham

From the above regression equation, we draw the conclusion of the interaction test: For the Z variable in equation II, it is significant and then the Z variable in equation III is not significant and the interaction variable ZX1 is also insignificant. That is, the third hypothesis that the Research and Development Integrity moderates the influence of Profitability on the Stock Price is rejected (H3 rejected).
Then, for the Z variable in equation II, it is significant and then the Z variable in equation III is not significant but the interaction variable ZX2 is also significant. From these results, Z is a pure moderation variable. That is, the fourth hypothesis that states that Research and Development Intensity moderates the influence of Liquidity on Stock Prices is trimmed (H4 accepted).

5. Discussion

From the results of multiple regression analysis, the profitability proxied by ROA (return on asset) has no effect on the stock price. These results are in line with previous findings conducted by (Pringgadani Claudea Sari et al., 2023). Then, the results of the study show that the liquidity proxied by CR (current ratio) has a negative effect on the stock price. This result is also in line with the results of a study from Amrah & Elwisam (2019) showing that too high liquidity reflects less effective liquidity management, which indicates that the company does not manage

cash flow and investment well. This can cause investors to be less interested in buying the company's shares, resulting in a decrease in demand for shares. In addition, research by Lutfi & Sunardi (2019) states that liquidity has a negative influence on stock prices. Liquidity is the ability of a company to meet short-term obligations, such as taxes, debt and dividends (Hasan et al, 2022).

Then, the results of the moderation variable test analysis showed that the research and development intensity variable had a moderation effect in a negative direction (weakening) the liquidity variable on the stock price. This is in line with the results of research by Jiang, John and Larsen (2018) in their research revealing that R&D intensity has a complex influence on profitability, liquidity and stock price volatility. Then the results of research from Dass, Nanda, and Xiao (2014) stated that R&D intensity has a significant impact on profitability and liquidity, which is ultimately reflected in the company's more stable and increasing stock prices.

6. Conclusion

Based on the results of multiple regression analysis, the first hypothesis was rejected. The profitability proxied by ROA (return on asset) has no effect on the stock price. This can be interpreted that at this time, investors do not consider the size or size of the company's ROA. Moreover, at the beginning of 2020, the Covid-19 virus hit the world and Indonesia. The Covid-19 pandemic that occurred in early 2020 also had an impact on the wheels of the Indonesian economy so that investors may understand when the company's ROA has a fluctuating value and does not affect investors to buy shares in the company (Nasution et al, 2020), (Hadiwardjojo, 2020).

Furthermore, the results of the study showed that the second hypothesis was accepted. In other words, the liquidity proxied by CR (current ratio) has a negative effect on the stock price. Investors may assess the liquidity of a company above 200% (too liquid) then the company describes having a large amount of idle cash, so it can indicate its inefficiency in cash management. Investors will assess the stock price when the level of liquidity is considered safe so that the company can be said to be in a position that is considered promising and can be efficient in managing cash (Sukaryasih, et al, 2019).

Furthermore, the results of the moderation variable test analysis show that the research and development intensity variable has a moderation effect in a negative direction (weakening) the liquidity variable on the stock price. If the intensity of research and development with high funds is high, it will be considered to interfere with the company's liquidity so that it can be considered detrimental. The intensity of research and development is considered to need to be limited in terms of funds (expenditures). If the funds spent are given a limit, then research and development activities will be able to maximize the funds so that they will not be used for many experiments or experiments that are considered unprofitable for the company.

However, this research cannot be used to assess for of all business aspects especially the manufacturing sector of the food and beverage industry, due to its limitations on several things. The first is that when the research was conducted, there was an extreme change in conditions in 2020 when the COVID-19 pandemic was hitting the world, especially Indonesia. Second,

information on the amount of funds allocated for research and development is limited, as not all companies record or disclose the funds they allocate for research and development activities..

References

Amrah, R. Y., & Elwisam, E. (2019). Pengaruh Current Ratio, Return On Assets, Debt To Equity Ratio Dan Total Assets Turnover Terhadap Harga Saham Pada Perusahaan LQ45 Tahun 2013-2015. *Oikonomia: Jurnal Manajemen*, *14*(1). https://doi.org/10.47313/oikonomia.v14i1.513

Dewi, S. P., & Hidayat, R. (2019). Pengaruh Net Profit Margin dan Return on Assets terhadap Harga Saham pada Perusahaan Otomotif yang terdaftar di Bursa Efek Indonesia. *Jurnal Ilman: Jurnal Ilmu Manajemen*.

Hall, J. (1993). The Stock Market's Valuation of R&D Invesment During The 1980s. *American Economic Review*.

Jiang, Cheng and John, Kose and Larsen, David. (2018). R&D Investment Intensity and Jump Volatility of Stock Price. *SSRN*.

Padgett, R., & Galan, J. (2010). The Effect of R&D Intensity on Corporate Social Responsibility. *Journal of Business Ethies*.

Pringgadani Claudea Sari, W., Ngurah Suyatna Yasa, D. P., & Ayu Surasmi, D. I. (2023). Effect Of Profitability, Liquidity, Price Investment Decision Share With Company Value As An Intervening Variable. *International Journal of Management Studies and Social Science Research*. https://doi.org/10.56293/ijmsssr.2022.4561

Rozeff, M. 1982. *"Growth, beta and agency costs as determinants of dividend payout ratios"*. Journal of Financial Research, Vol. 5, hal: 249–259.

Saprudin, Saprudin. (2019). Pengaruh Kepemilikan Manajerial, Leverage dan Profitabilitas Terhadap Harga Saham Perusahaan Manufaktur. *Journal of Information System, Applied, Management, Accounting and Research*, [S.l.], v.3, n.3, p.19-26. ISSN 2598-8719.

Sholichah, M., Jihadi, M., Widagdo, B., Mardiani, N., Nurjanah, D., &Aulia, Y. (2021). The Effect of RGEC and EPS on Stock Prices : Evidence from Commercial Banksin Indonesia. *Journal of Asian Finance, Economict and Business*, 8(8), hlm.67-74. https://doi.org/10.13106/jafeb.2021.vol8.no8.0067

Sugiyono. (2009). *Metode Penelitian Bisnis (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. Bandung: Alfabeta.

Sugiyono. (2010). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Suliyanto. (2011). *Ekonometrika Terapan Teori dan Aplikasi dengan SPSS*. Yogyakarta: Andi.

Tendelilin, Eduardus. *Portofolio dan Investasi: Teori dan Aplikasi*, Yogyakarta: Kanisius, 2010.

Urwick, Hunt. *Business strategy and Management*. Ketersediaan Online : http://www.oppapers.com/essays/Strategy-Management/570590. 2002.

Weston J. Fred dan Thomas E. Copeland. 1995. *Manajemen Keuangan Jilid I*. Terjemahan Jaka Wasana dan Kibrandoko. Binarupa Aksara. Jakarta.