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THE EFFECT OF CAPITAL STRUCTURE AND LIQUIDITY ON PROFITABILITY OF PHARMACEUTICAL COMPANIES IN 2020-2024

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Abstract

The COVID-19 pandemic has brought major changes in the pharmaceutical industry, increasing demand for health products while challenging the financial stability of companies. In the midst of economic recovery, the efficiency of managing capital structure and liquidity is very important to maintain the profitability of pharmaceutical companies. This study aims to analyze the influence of capital structure and liquidity on the profitability of pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. The method used is quantitative statistics where the approach is with the panel data regression analysis technique. Capital structure variables are measured using Debt to Equity Ratio (DER), liquidity with Current Ratio (CR), and profitability with Return on Assets (ROA). The sample used consisted of 7 companies selected based on specific criteria. The results show that partially, capital structure has a significant effect on profitability, while liquidity has no significant influence. However, simultaneously, these two variables have a significant influence on profitability with a contribution of 74.5%. These findings emphasize the importance of proper capital structure planning in an effort to improve the financial performance of pharmaceutical companies in the post-pandemic era.
Keyword : *Capital Structure, Liquidity, Profitability*

Abstrak

Pandemi COVID-19 telah membawa perubahan besar dalam industri farmasi, meningkatkan permintaan terhadap produk kesehatan sekaligus menantang stabilitas keuangan perusahaan. Di tengah masa pemulihan ekonomi, efisiensi pengelolaan struktur modal dan likuiditas menjadi sangat penting untuk mempertahankan profitabilitas perusahaan farmasi. Penelitian ini bertujuan untuk menganalisis pengaruh struktur modal dan likuiditas terhadap profitabilitas perusahaan farmasi yang terdaftar di Bursa Efek Indonesia (BEI) selama periode 2020–2024. Metode yang digunakan adalah kuantitatif statistic dimana pendekatan dengan teknik analisis regresi data panel. Variabel struktur modal diukur menggunakan Debt to Equity Ratio (DER), likuiditas dengan Current Ratio (CR), dan profitabilitas dengan Return on Assets (ROA). Sampel yang digunakan terdiri dari 7 perusahaan yang dipilih berdasarkan kriteria tertentu. Hasil penelitian menunjukkan bahwa secara parsial, struktur modal berpengaruh signifikan terhadap profitabilitas, sementara likuiditas tidak memiliki pengaruh yang signifikan. Namun secara simultan, kedua variabel tersebut memberikan pengaruh signifikan terhadap profitabilitas dengan kontribusi sebesar 74,5%. Temuan ini menekankan pentingnya perencanaan struktur modal yang tepat dalam upaya meningkatkan kinerja keuangan perusahaan farmasi di era pascapandemi.
Kata Kunci: Struktur Modal, Likuiditas, Profitabilitas

I. INTRODUCTION

The COVID-19 pandemic has changed many aspects of life, including the industrial sector. The pharmaceutical industry is one of the sectors that has experienced a surge in demand due to the increasing need for health products, such as medicines, supplements, and medical devices. However, this increase in demand does not necessarily guarantee an increase in the profitability of pharmaceutical companies. This is due to the large capital requirements, fluctuations in the supply chain, and increased business risks.

Good financial management is very important to maintain operational stability and efficiency. Two important aspects in financial management are capital structure and liquidity. An unbalanced capital structure, such as a high proportion of debt compared to equity, can increase interest expenses and the risk of bankruptcy. On the other hand, liquidity that is too high can indicate that the company is not utilizing its current assets efficiently.

This study aims to empirically test how capital structure and liquidity affect the profitability of pharmaceutical companies listed on the IDX. By using data from 2020 to 2024, this study is expected to provide a more comprehensive picture of the financial dynamics of the pharmaceutical sector in Indonesia during the crisis and economic recovery.

II. THEORETICAL STUDIES

Capital Structure

Capital Structure refers to the composition of debt and equity used by a company to finance its assets and operations. The optimal capital structure is a balance between the use of long-term debt and equity, which can affect the risk and return expected by shareholders (Noviadry Nur Tamtama & Riantisari, 2023). According to Riyanto (2010) "Capital structure is a balance or comparison between the amount of long-term debt and equity. Good capital structure management can increase profitability and company value."

Liquidity

Liquidity is a company's ability to meet its short-term obligations as they fall due (Qurota et al., 2022). Liquidity ratios, such as the Current Ratio (CR), are used to measure how well a company can pay short-term debt using its current assets. Kasmir (2016) stated that "The liquidity ratio shows the company's ability to pay its short-term debts. The higher the liquidity ratio, the lower the risk of the company's failure to meet its short-term obligations, which in turn can increase investor confidence."

Profitability

Profitability is a measure of a company's ability to generate profits from its operational activities. Profitability ratios, such as Return on Assets (ROA) and Return on Equity (ROE), are used to assess the effectiveness of management in generating profits. According to Kasmir (2016) "Profitability is a ratio used to assess a company's ability to seek profits." High profitability indicates that the company can manage its assets and equity well, which will attract investors and increase the company's value (Made et al., 2021).

III. RESEARCH METHODS

Research Design

This study uses a quantitative method with a descriptive approach. The aim is to determine the effect of Debt to Asset Ratio (DAR) and Debt to Equity Ratio (DER) and liquidity on the profitability of pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) during the period 2022-2024. This financial report can be found on the IDX website, www.idx.co.id.

Population and Research Sample

Population

According to (Sinambela, 2021) Population is an object/subject that has a certain quantity and characteristics determined by the researcher to be studied and then conclusions drawn. "Population is not only the number of subjects or objects that exist, but includes all the qualities and characteristics possessed by the subject or object." (Agustina, 2023).

Sample

According to Everitt & Scrondal, (2010) in (Swarjana, 2022) "A sample is a selected part of a population that is selected through several processes with the aim of investigating or studying certain characteristics of the parent population."

In this study, samples were taken using the saturated sampling method, namely a sampling technique in which the entire population is used as a sample. This means that if the number of populations studied is relatively small or limited, then all those included in the population are used as respondents or research objects.

The criteria for drawing samples include:

1. Pharmaceutical companies listed on the IDX from 2020-2024.
2. Pharmaceutical companies listed on the IDX that report their financial statements for 2020-2024.
3. Pharmaceutical companies listed on the IDX in 2020-2024 that use the currency IDR.

4. Pharmaceutical companies listed on the IDX in 2020-2024 recorded complete profits in sequence from 2020 - 2024.

Table III. 1 Data on Companies That Are Samples for Research

No	Keterangan	Jumlah
	Population: Pharmaceutical companies listed on the IDX in 2020–2024	13
1	Companies not listed on the IDX	0
2	Companies that do not report complete financial reports	- 5
3	Companies that do not use Rupiah currency	0
4	Companies that did not record profits during 2020–2024	- 1
	Research Sample	9
	Observation Year	5
	Total Sample (n x research period) = (7 x 5 years)	35

Source: Data processed by researchers (2025)

Operational Definition of Variable

Operational definition is part of the research that provides information on how to measure variables. This is scientific information that is very helpful for other researchers who want to conduct research with the same variables because they will know how to measure variables that are built on the same concept.

Data Collection Technique

This research uses the documentation study data collection technique through secondary data analysis that is relevant to this research. Secondary data collected by researchers comes from the annual financial data of the company that is the subject of this research. This research is conducted by collecting data and publishing it in printed form such as books, journals, or other sources. In addition, samples of data collected can be accessed via a computer connected to the internet, such as www.idx.co.id, https://scholar.google.co.id, and www.google.co.id, which include financial data and those related to this research.

Data Analysis Technique

Data analysis is the process after data is collected from all responses. This includes combining data on variables and types of respondents, tabulating data on the variables studied, preparing data on the variables studied, performing calculations to answer the problem formulation, and performing calculations to test the proposed hypothesis (Sugiyono, 2022). Descriptive statistics, multiple regression analysis, classical assumption testing, and hypothesis testing are all types of tests used in this study. The data processing for this study used IBM SPSS version 29.

IV. RESEARCH RESULTS

Research Data Description

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
X1	35	.1295	.9932	.441946	.2592683
X2	35	1.5028	6.5166	3.321477	1.1434871
Y	35	.0412	.3099	.130077	.0674291
Valid N (listwise)	35				

Source: Data processed by researchers (2025)

Figure I Data Description

Based on the results of descriptive statistical analysis of 35 observations, it is known that the capital structure variable (X1) has a minimum value of 0.1295 and a maximum of 0.9932, with an average of 0.4419 and a standard deviation of 0.2593. This shows that the use of debt to equity in pharmaceutical companies tends to vary. Meanwhile, the liquidity variable (X2) has a minimum value of 1.5028 and a maximum of 6.5166, with an average of 3.3215 and a standard deviation of 1.1435. This reflects that most companies have a relatively good ability to pay short-term liabilities. The profitability variable (Y), as measured by Return on Assets (ROA), shows a minimum value of 0.0412 and a maximum of 0.3099, with an average of 0.1301 and a standard deviation of 0.0674. This shows that the company's ability to generate profits from its assets still varies.

Data Quality Test

Validity Test

Correlations

		X1	X2	Y
X1	Pearson Correlation	1	-.799**	-.543**
	Sig. (2-tailed)		<.001	<.001
	N	35	35	35
X2	Pearson Correlation	-.799**	1	.542**
	Sig. (2-tailed)	<.001		<.001
	N	35	35	35
Y	Pearson Correlation	-.543**	.542**	1
	Sig. (2-tailed)	<.001	<.001	
	N	35	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Data processed by researchers (2025)

Figure II. Validity Test Results

The results of this correlation test show a strong and statistically significant relationship between all pairs of variables tested, which can be important evidence in evaluating the validity of measurements or relationships between constructs.

Reliability Test

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.442	.835	3

Source: Data processed by researchers (2025)

Figure III Reliability Test Results

This table presents the results of the calculation of the Cronbach's Alpha coefficient, which is one of the most common methods used to measure the internal consistency or reliability of a measurement instrument (e.g., a questionnaire or scale). However, this reliability test uses secondary data from financial statements (not questionnaire results), the interpretation of the reliability test results becomes very crucial and different from the standard interpretation for perception scales.

The low Cronbach's Alpha (0.442) in this case is something that is acceptable and even expected. This is because the three financial indicators (represented by "3 items" in N of Items) are likely to measure different dimensions or have different variability. In short, In short, this Cronbach's Alpha result should be ignored or at least considered uninformative in evaluating the quality of financial statement data.

Classical Assumption Test

Normality Test

One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			35
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		.25591568
Most Extreme Differences	Absolute		.110
	Positive		.109
	Negative		-.110
Test Statistic			.110
Asymp. Sig. (2-tailed)[c]			.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		.343
	99% Confidence Interval	Lower Bound	.331
		Upper Bound	.355

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 334431365.

Source: Data processed by researchers (2025)

Figure IV Results of Normality Test

The normality test is conducted to determine whether the residual data from the regression model is normally distributed. In this study, the test was conducted using the One-Sample Kolmogorov-Smirnov Test. Based on the test results, the Asymp. Sig. (2-tailed) value was obtained at 0.200 which is greater than 0.05. This indicates that the residual data is normally distributed. The normal distribution of residuals is one of the important assumptions in classical linear regression, because if this assumption is met, the parameter estimation

results will be more valid and accurate. Thus, the regression model used in this study has met the normality assumption, which means that the distribution of errors or differences between predicted values and actual values does not deviate systematically, but rather spreads randomly and symmetrically around the zero value.

Multicollinearity Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.507	.328		7.647	<.001		
	X1	1.424	.285	.732	4.994	<.001	.371	2.696
	X2	-.070	.065	-.158	-1.075	.290	.371	2.696

a. Dependent Variable: Y

Source: Data processed by researchers (2025)

Figure V Multicollinearity Test Results

Multicollinearity is a condition in which there is a high correlation between independent variables in a regression model, which can disrupt the stability and interpretation of the regression coefficient. To detect multicollinearity, the Tolerance and Variance Inflation Factor (VIF) values are used. The results of the analysis show that the Tolerance value for X1 and X2 is 0.371, while the VIF value for both is 2.696. The VIF value which is still below the critical limit of 10 and the Tolerance value which is greater than 0.1 indicates that there is no multicollinearity in the model. This means that each independent variable in the model does not have a correlation that is too high with each other so that it can explain the dependent variable independently. Therefore, the regression model is suitable for further analysis without any concerns about coefficient distortion due to the relationship between independent variables.

Heteroscedasticity Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.393	.164		2.392	.023		
	X1	-.022	.143	-.040	-.151	.881	.371	2.696
	X2	-.052	.033	-.424	-1.588	.122	.371	2.696

a. Dependent Variable: ABS_RES

Source: Data processed by researchers (2025)

Figure VI Heteroscedasticity Test Results

Heteroscedasticity is a condition in which the residual variance is not constant at all levels of independent variable prediction, which can cause the regression results to be inefficient. To detect heteroscedasticity, the Glejser test is used to see the significance of the

relationship between the absolute value of the residual (ABS_RES) and the independent variable. The results of the analysis show that the significance value for the capital structure variable (X1) is 0.881 and for liquidity (X2) is 0.122. Both significance values are above the 0.05 significance level, so it can be concluded that there are no symptoms of heteroscedasticity in this regression model. This means that the distribution of residuals is homogeneous or constant, and thus the regression model meets the assumption of homoscedasticity. This is important because the presence of heteroscedasticity can cause the standard error of the coefficient to be biased and result in invalid statistical conclusions.

Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.863[a]	.745	.729	.26379	.745	46.656	2	32	<.001	1.443

a. Predictors: (Constant), X2, X1
b. Dependent Variable: Y

Source: Data processed by researchers (2025)

Figure VII Autocorrelation Test Results

Autocorrelation is the relationship between the current residual value and the previous residual value. In regression analysis, the presence of autocorrelation violates the assumption of independence of errors and can interfere with the accuracy of the model, especially in time series data. To detect autocorrelation, the Durbin-Watson (DW) test is used. The test results show a DW value of 1.443. Although this value is slightly below the recommended general limit (which is between 1.5 and 2.5), it is still within the acceptable range to conclude that there is no autocorrelation in the model. In other words, the residuals from the regression model do not show a systematic pattern of association between time or observations. The absence of autocorrelation strengthens the validity of the regression model used in this study, because it shows that the error is random and does not follow a certain pattern from one observation to another.

Hypothesis Testing

T-Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	2.507	.328		7.647	<.001			
	X1	1.424	.285	.732	4.994	<.001	.858	.662	.446
	X2	-.070	.065	-.158	-1.075	.290	-.739	-.187	-.096

a. Dependent Variable: Y

Source: Data processed by researchers (2025)

Figure VIII T-Test Results

The t-test is used to determine the effect of each independent variable partially on the dependent variable. Based on the results of the t-test, it is known that the capital structure variable (X1) has a significance value of <0.001 with a t value of 4.994. Because the significance value is less than 0.05, it can be concluded that the capital structure has a significant effect on profitability (Y). The regression coefficient of 1.424 indicates that every 1 unit increase in the capital structure (DER) will increase profitability (ROA) by 1.424 units, assuming other variables are constant. In contrast, the liquidity variable (X2) has a significance value of 0.290 (> 0.05) with a t value of -1.075, which means that liquidity does not have a significant effect on profitability. These results indicate that in the context of pharmaceutical companies, debt management efficiency has a greater effect on the ability to generate profits than the ability to meet short-term obligations.

F Test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.493	2	3.247	46.656	<.001[b]
	Residual	2.227	32	.070		
	Total	8.720	34			

a. Dependent Variable: Y
b. Predictors: (Constant), X2, X1

Source: Data processed by researchers (2025)

Figure IX F Test Results

The F test is used to test whether all independent variables simultaneously have a significant effect on the dependent variable. Based on the ANOVA results, the calculated F value is 46.656 with a significance of <0.001, which is much smaller than 0.05. This shows that capital structure (X1) and liquidity (X2) simultaneously have a significant effect on profitability (Y). This means that the regression model used in this study as a whole is fit and feasible to be used to predict or explain the profitability variable. This finding reinforces the importance of managing both financial aspects in an integrated manner in improving the financial performance of pharmaceutical companies.

Determination Coefficient Test

Partial Determination Coefficient Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations		
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
1	(Constant)	2.507	.328		7.647	<.001			
	X1	1.424	.285	.732	4.994	<.001	.858	.662	.446
	X2	-.070	.065	-.158	-1.075	.290	-.739	-.187	-.096

a. Dependent Variable: Y

Source: Data processed by researchers (2025)

Figure X Partial Determination Coefficient Test Results

Based on the partial correlation value, variable X1 shows a stronger partial determination coefficient with a value of 0.662, which means that X1 contributes 43.8% (0.662^2) to the variation of Y when the influence of X2 is controlled or considered constant. Meanwhile, variable X2 has a partial correlation of -0.187, indicating a relatively small contribution of around 3.5% (0.187^2) to the variation of Y when the influence of X1 is controlled, with a negative relationship direction. This difference in partial correlation values indicates that X1 has a much more dominant individual influence than X2 in influencing the dependent variable Y, so that X1 can be considered a more important predictor in this regression model.

Simultaneous Determination Coefficient Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.863[a]	.745	.729	.26379	.745	46.656	2	32	<.001

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

Source: Data processed by researchers (2025)

Figure XI Results of Simultaneous Determination Coefficient Test

The results of the analysis show that the regression model has an R Square value of 0.745 or 74.5%, which indicates that the independent variables X1 and X2 together are able to explain 74.5% of the total variation that occurs in the dependent variable Y. The Adjusted R Square value of 0.729 indicates that after adjusting the number of variables and sample size, the model's ability to explain the variation in Y remains high at 72.9%. This shows that the regression model formed has good goodness of fit and can be relied on for prediction purposes, with the remaining 25.5% influenced by other factors not included in this research model.

Discussion of Research Results

The Effect of X1 on Y

Based on the results of the t-test in the regression coefficient table, the capital structure variable (X1) has a significance value of 0.000, which is smaller than the significance level of 0.05. This shows that X1 has a significant partial effect on the Y variable (profitability). The regression coefficient value of X1 of 1.424 indicates that every one unit increase in the capital structure will increase profitability by 1.424 units, assuming other variables remain constant. In addition, the beta value of 0.732 indicates that the influence of X1 on Y is strong

and positive. Thus, it can be concluded that the capital structure has a partial positive and significant effect on the profitability of the pharmaceutical company studied.

The Effect of X2 on Y

The results of the t-test also show that the liquidity variable (X2) has a significance value of 0.290, which is greater than 0.05. The calculated t value of -1.075 and the negative regression coefficient of -0.070 indicate a negative relationship, but it is not statistically significant. This means that the liquidity variable does not have a partial significant effect on profitability (Y) in this model.

The Effect of X1 and X2 on Y

Based on the results of the partial regression test, the capital structure variable (X1) is proven to have a positive and significant effect on profitability (Y) with a significance value of 0.000 <0.05 and a regression coefficient of 1.424, which means that every one unit increase in the capital structure will increase profitability by 1.424 units. The beta value of 0.732 indicates that the effect of X1 on Y is strong. On the other hand, the liquidity variable (X2) does not have a significant effect on Y because it has a significance value of 0.290> 0.05 and a regression coefficient value of -0.070. However, liquidity still plays a role in the model simultaneously and needs to be managed efficiently so as not to hinder the company's profitability performance.

V. CONCLUSION

Based on the results of the study on the effect of capital structure and liquidity on profitability in pharmaceutical companies listed on the Indonesia Stock Exchange for the period 2020-2024, it can be concluded that capital structure has a dominant and significant effect on profitability with a significance value of 0.001 <0.05 and a beta coefficient of 0.732, while liquidity does not show a significant effect partially with a significance value of 0.290> 0.05 even though it has a negative relationship. Simultaneously, both independent variables have a significant effect on profitability as evidenced by the F test with a significance of <0.001, where the combination of capital structure and liquidity is able to explain 74.5% of the variation in the profitability of pharmaceutical companies. This finding indicates that optimal capital structure management is the main key to increasing the profitability of pharmaceutical companies, while liquidity, although important for operations, does not contribute significantly to increasing profitability in the context of the pharmaceutical industry in Indonesia.

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