The Effect of Profitability Ratio, Efficiency Ratio, and Economic Growth on Debt to Equity Ratio: A Case Study on Health Sector Companies Listed on the Indonesia Stock Exchange

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Abstract. This research aims to study the effect of Profitability Ratio, Efficiency Ratio, and Economic growth on Debt to Equity Ratio on health sector companies listed on the Indonesia Stock Exchange (IDX) for the period of 2015-2020. A regression model of random effect panel data was used to explain the relationship. Data used in the study were collected from financial reports of 12 companies in the health sector listed on the IDX. The results of the t-test in this study prove that the Efficiency Ratio as represented by Accounts Payable Ratio has a significant effect on Debt to Equity Ratio. On the other hand, profitability ratio and Economic Growth (Growth of Gross Domestic Product) have no significant effect on Debt to Equity ratio. F-test results shows that the Profitability Ratio, Efficiency Ratio, and Economic Growth simultaneously have significant effects on the Debt to Equity Ratio.

Keywords: Profitability Ratio, Efficiency Ratio, Economic growth, Debt to Equity Ratio, health sector.

1 Introduction

Gross domestic product is the product of the quantity of production and the price of goods and services in a country. GDP growth, as a measure of economic growth, is thus influenced by factors increasing the quantity of production and prices of goods and services. The increase in the price of goods and services (inflation) itself encourages producers to increase their production.

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In carrying out production, producers need sources of funding, which can be obtained through debt or additional capital. One of the measures used in assessing a company's capital structure is the debt to equity ratio. If inflation theoretically encourages people to increase production, then the possible chain effect is that companies will increase sources of funding that can be obtained by issuing new shares (equity) or increasing debt, which will affect the capital structure.

Rivai's research (2011) shows that there is a relationship between GDP and company's capital structure, that is an increase in GDP goes hand in hand with an increase in the debt to equity ratio, and vice versa [1]. The increase in debt also affects creditors' perceptions of the risk of default, which in turn affects the amount of debt that can be obtained by the company.

The COVID-19 pandemic situation that began in early 2020 created opportunities for the healthcare industry. One of the indicators can be seen from its contribution to the rate of economic growth in Indonesia. GDP grew by 3.51% in the third quarter (YoY), where the sector that grew significantly was the health sector, which was 14.06%. Meanwhile, in 2020 exports of medical devices from Indonesia reached US$ 197.6 million, showing a four-fold increase compared to 2019, which was US$ 49.6 billion [2].

At the corporate level, the company's efforts to generate profit (profitability) through business expansion, increase the company's funding sources from the internal side, which suppresses the need to add new sources of funding. Measures commonly used in assessing profitability include Net Profit Margin (NPM), Return on Equity, and Return on Assets. Siregar and Fahmi‘s (2018) research on property and real estate companies on the IDX, shows that NPM has a significant negative relationship with capital structure[3]. Meanwhile, Hartono's (2013) research on manufacturing companies on the IDX shows that Return on Assets has a negative effect on the Debt to Equity Ratio [4].

The company's operating activities are basically asset utilization activities, which if carried out more efficiently will have a positive impact on the company's financial performance. This in turn makes financial position stronger which lower needs for external funding. Some of the efficiency measures commonly used are Account Receivable Turnover, Account Payable Turnover, and Fixed Asset Turnover. Amanda's research (2019) shows that the effect of Fixed Asset Turnover on the Debt to Equity Ratio in garment companies listed on the Indonesia Stock Exchange is not significant [5].

According to Jie (2019) each industry has its own unique funding structure [6]. Therefore, this study limits the industry that is used as a sample to the health industry. The aim of this research is to examine the relationship between the profitability of the efficient use of assets and economic growth on its capital structure.

2 Basic theory and methodology

2.1 Basic theory

Profitability Ratios. This ratio shows the company's ability to generate profits. The ratio to measure profitability is taken from the figures in the financial statements which consist of a

balance sheet and income statement. Profit is internal source of fund that affect equity. The profitability ratios in this study are measured by the following measures:

Net Profit Margin, which is the comparison between net profit and net sales. The formula for this ratio is as follows:

$$Net\ Profit\ Margin = \frac{Net\ Profit}{Net\ Sales}\ x\ 100\% \quad (1)$$

Return on Equity, which shows the magnitude of the effect of equity in generating net income [7]. Return on equity is formulated by:

$$Return\ on\ Equity = \frac{Net\ Profit}{Total\ Equity}\ x\ 100\% \quad (2)$$

Return on Assets, which shows the amount of assets used to generate net income [7]. Return on Assets is formulated by:

$$Return\ on\ Asset = \frac{Net\ Profit}{Total\ Asset}\ x\ 100\% \quad (3)$$

Efficiency ratio or activity ratio. This ratio measures the level of efficiency in the use of assets to earn a profit. That is, the use of this ratio aims to measure the company's efficiency in the use of company resources [8]. The efficiency ratio used as a proxy in this study consists of:

Account Receivable Turnover Ratio, which shows how often receivables in one accounting cycle occur in sales. The rate of frequent billing is also determined by the average billing period in a year. Accounts Receivable Turnover is formulated as follows:

$$Account\ Receivable\ Turnover\ = \frac{Net\ Sales}{Average\ Account\ Receivable} \quad (4)$$

Account Payable Turnover ratio measures trade payable turnover in a certain period [4]. The lower the turnover of accounts payable, indicates that the payment period to suppliers is getting longer, and vice versa. The Accounts Receivable Turnover formula is as follows:

$$Account\ Payable\ Turnover = \frac{Total\ Purchases}{Average\ Account\ Payable} \quad (5)$$

Fixed Asset Turnover is used to determine the frequency of investing funds in fixed assets within a certain period of time.Thus, this ratio shows how effective the company is in managing fixed assets in its operating activities. The ratio is formulated as follows:

$$Fixed\ Asset\ Turnover = \frac{Net\ Sales}{Average\ Net\ Fixed\ Assets} \quad (6)$$

Economic growth. Economic growth is a condition of increasing the amount of production of goods and services that reflects economic activity in the community, which shows an increase in people's prosperity. The rate of economic growth is calculated by the formula:

$$Growth\ Rate = \frac{GDP\ in\ Year\ 2 - GDP\ In\ Year\ 1}{Real\ GDP\ in\ Year\ 1} \times 100\% \quad (7)$$

Debt to Equity Ratio is used to assess the proportion of debt to company equity [8]. The tendency of companies to increase their debt in increasing the funding of their assets is because the cost of equity is generally higher than the cost of debt. On the other hand, the higher portion of debt to equity results in an increased risk of the company's failure to pay its debts. The debt to equity ratio formula is as follows:

$$Debt\ to\ Equity\ Ratio = \frac{Total\ Debt}{Total\ Equity}\ x\ 100\% \quad (8)$$

The Research Hypotheses are as follows:

H_1: There is an effect of Profitability Ratio on Debt to Equity Ratio

H_2: There is an effect of Efficiency Ratio on Debt to Equity Ratio

H_3: There is an effect of Economic Growth on Debt to Equity Ratio

H_4: There is a simultaneous effect of Profitability Ratio, Efficiency Ratio, and Economic Growth on the Debt to Equity Ratio

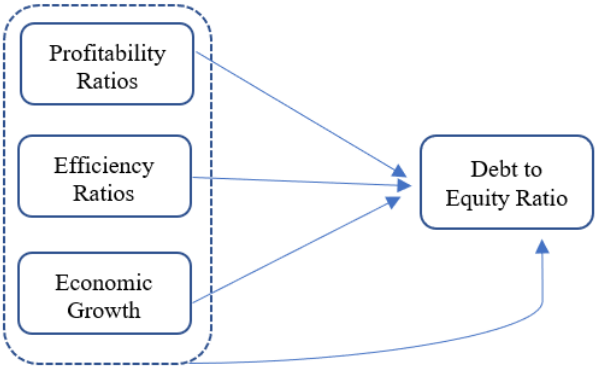
2.2 Methodology

This type of research is explanatory, which explains the relationship of one variable to another [11]. The relationship between variables to be studied is the influence between the variables Profitability Ratio, Efficiency Ratio, and Economic Growth on the Debt to Equity Ratio.

This study limits the data sample from 12 companies that have been listed on the Indonesia Stock Exchange at least since 2015. The sampling criteria are as follows: (a) are in the classification of the health sector, (b) have been listed on the Indonesia Stock Exchange since

January 1, 2015 The data used are raw data from the elements of the balance sheet or company profits mentioned above, which have been audited.

The data analysis method chosen is multiple linear regression, which relates the independent and dependent variables, with the following framework:



The analysis can

Descriptive Sta antitative data to obtain a general

Classical Assumption Test, which is a test method that is carried out as a requirement before performing multiple linear regression testing, that is:

Normality test, which is a test to obtain information whether the data used is normally distributed or vice versa [9]. This test is necessary because a good regression model requires a normal distribution of data.

Autocorrelation test, which is a test to obtain information about the relationship between data movement patterns in a period to the previous period. Autocorrelation problems occur if the patterns of the two types of data are related. The Wooldridge test can predict whether the regression model has an autocorrelation problem, namely if the probability value of the calculated result is less than sig. 0.05 then H0 is accepted, or the data does not experience autocorrelation problems.

Multicollinearity test, is used to determine whether there is a correlation between the independent variables. In a good regression model there should be no collinearity problem, as measured by Variance Inflation Factors (VIF). The criteria, if VIF 0 <10 and tolerance value (1/VIF) < 10, then there is no indication of multicollinearity.

Multiple Linear Regression, which is intended to help researchers analyze independent variables on the dependent variable, to obtain information whether there is a relationship between research variables or not. If the data in the study is a combination of time series and cross section data, it will form panel data.

There are three models of selecting the right regression model for panel data [10], (a) Common Effect Model (Pooled Least Square), which is a model that combines time series and cross section data, (b) Fixed Effect Model, which is a model which assumes that each intercept value owned by the research object is different from one another, but the slope value is the same over time and (c) Random Effect Model, which assumes that each individual has a specific effect which is a random error component and does not correlate with the variable being studied. observed. There are 3 test procedures that need to be carried out, to make the selection:

Chow Test, is a test process that aims to select the best model to be applied, whether it is a fixed effect or common effect model. The hypotheses used in this test are: H_0: *common effect model* and H_1: *fixed effect model.*

Hausman Test, is a test used after obtaining the results of random effects and fixed effects. The hypotheses are H_0: random effect model and H_1: fixed effect model. In this test, H0 will be rejected if the Hausman count (Chi^2) is higher than Chi^2 table (Chi^2 count > Chi^2 table).

Lagrange Multiplier, is a test used after obtaining the results of random effects and common effects. The hypotheses are H_0: *common effect model* and H_1: *random effect model*. H_0 will be rejected if the calculated LM value is greater than Chi^2.

If the model selection for panel data regression has been obtained, it is necessary to test the hypothesis for the regression equation that is made. Thus, this hypothesis test aims to determine whether among the independent variables, namely Net Profit Margin (NPM), Return on Equity (ROE), Return on Assets (ROA), Accounts Receivable Turnover (ART), Account Payable Turnover (APT), Fixed Asset Turnover (FAT), and Gross Domestic Product (GDP) have a relationship with the dependent variable Debt Equity Ratio (DER). The method used includes a global or simultaneous test (F test) and a partial test of each independent variable (t test). Hypothesis testing includes:

Simultaneous Test (F test), simultaneously tests the independent variable with the dependent variable to measure the significance of the relationship between the two [11]. The formula used to perform the F test is:

$$F = \frac{R^2}{k} / \frac{(1-R^2)}{(n-k-1)} \tag{9}$$

Where:

F = F-count value

R^2 = Multiple correlation coefficient

k = Number of independent variables (observations)

n = Number of sample members

The criteria for conclusions are: H_0 will be accepted if F-table F-count and P Value > 0.05 significance level. On the other hand, H_0 will be rejected if F-table < F-count and P Value < 0.05 significance level.

Partial Test (t test), is useful for knowing the significance level of the relationship between the independent variable and the dependent variable partially (one by one) from each variable. The criteria are: If sig. <0.05, it is stated that the independent variable has a significant influence on the dependent variable. The t value is calculated by the formula:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \tag{10}$$

Where:

t = t-count value

r = Correlation coefficient

r^2 = Coefficient of determination

n = Number of observed sample members

R^2 Test (Coefficient of Determination) is used to show the magnitude of the influence that the X variable has on the Y variable [12]. The coefficient of determination shows: (a) measurement of the fit of the regression line derived from the estimation results of the match with the observation data, which means that the higher the R^2 level, the more precise the resulting regression line. (b) measurement of how much diversity X variable is able to explain Y variable.

3 Results and discussion

Based on the financial statements of the 12 companies that became the data sources, the year-end report data collection which has been audited from 2015 to 2020. The descriptive statistics of the processed data for each research variable are as shown in Table 1.

Table 1. Descriptive Statistics of Research Variables

Variable	Obs	Mean	Std. dev.	Min	Max
DER	72	0.652567	0.6010549	0.0761251	2.981479
NPM	72	0.0832	0.269733	-0.88544	1.900987
ROE	72	0.1056	0.258179	-0.82346	1.890241
ROA	72	0.7858	0.130582	0.237863	0.920997
ART	72	5.0477	2.071136	2.00872	11.04452
APT	72	11.54	6.98841	1.13679	32.77468
FAT	72	3.3613	2.20508	0.266611	11.86046
GDP	72	0.385	0.266749	-0.0207	0.051743

Source: Adellia (2022)

The model selection for panel data was carried out by using the Chow Test, Hausman Test, and Lagrange Test. The test results are shown in Table 2, Table 3 and Table 4.

Table 2. Chow Test Results

Fixed Effect (within) regression	Number of obs	72
	Number of groups	12
F-test that all u i=0: F (11, 53) = 45.94		Prob > F = 0.0000

Source: Adellia (2022)

The test results show a probability value of 0.0000, which means less than an alpha of 0.05. Based on the results of this test, H_0 is rejected. The H_0 of this test is the common effect model, therefore, the model chosen is the fix effect model.

Table 3. Hausman Test Results

Test of H_0	Difference in coefficients not systematic
Chi^2 (7)	(b-B)'[(V_b-V_B)^(-1)](b-B)
Prob > Chi2	0.5948

Source: Adellia (2022)

The test results show that Prob > Chi^2 is 0.5948, which means it is greater than alpha 0.05. These results indicate that H_0, which is a random effect model, instead of fixed effect model, is accepted.

Table 4. Lagrange Test Results

Test: Var(u)	0
Chibar2(01)	95.32
Prob>$Chibar^2$	0.0000

Source: Adellia (2022)

Lagrange Test, whose results are in Table 4, is used to select the common effect model or random effect model. The test results are as follows: Prob > $Chibar^2$ is 0.0000, which means it is smaller than alpha 0.05. Based on the test results, H_0 (common effect) is rejected so that the selected model is a random effect model.

The results of the normality test are shown in Tables 5 to 7. Normality tests were carried out using the Shapiro Wilk test, the Shapiro Francia test, and the Skewness-kurtosis test. Data with a normally distributed distribution is marked with a significance value of more than 0.05.

The test results on the three test methods show the value of Prob > Z, which are 0.05558, 0.06129, and 0.1473, all of which show values greater than 0.05 alpha. On this basis, it can be concluded that the tested data has a normal distribution.

Table 5. Shapiro Wilk W test for normality

Variable	Observation	W	V	z	Prob>Z
Resid	72	0.09491	3.206	2.537	0.05558

Source: Adellia (2022)

Tebel 6. Shapiro Francia W' test for normality

Variable	Observation	W'	V'	z	Prob>Z
Resid	72	0.95332	3.25	2.281	0.06129

Source: Adellia (2022)

Tabel 6. Skewness/kurtosis test for normality

Variable	Observation	Pr (skewness)	Pr (kurtosis)	chi2 (2)	Prob>chi2
Resid	72	0.0767	0.4037	3.83	0.1473

Source: Adellia (2022)

The multicollinearity test of the selected regression model needs to obtain a VIF value of less than 10 and a tolerance value of more than 0.10 to indicate that among the independent variables there is no multicollinearity problem. Table 7 shows the test results.

Table 7. Multicollinearity Test Results

Variable	VIF	1/VIF
ROA	168.77	0.005925
ROE	164.51	0.006079
ART	11.33	0.088232
APT	9.55	0.104686
GDP	7.85	0.127359
NPM	3.38	0.295657
FAT	3.03	0.330268

Source: Adellia (2022)

The test results show that the ROA, ROE, and ART variables have VIF values > 10, and 1/VIF less than 0.10, which means that there is a multicollinearity problem in these variables. While the other variables were not detected there was a collinearity problem.

The autocorrelation test was carried out using the Wooldridge test, the results are as shown in Table 8. The test results show the Prob > F value less than 0.05, which means there is an autocorrelation problem.

Table 8. Autocorrelation Test

H0	No first order autocorrelation
F (1,11)	17.208

Prob > F	0.0016

Source: Adellia (2022)

Regression test was carried out to determine the relationship between the independent variable and the dependent variable, with the results as shown in Table 9. The results of the t test showed that the APT variable had P > | t | of 0.026, or more than 0.05, which indicates that there is a significant partial relationship between APT and DER. The relationship is in opposite direction. This pattern is as expected: APT will be higher when – everything constant – Debt is less, and when debt is less, everything constant, Debt to Equity Ratio will also be less.

However, other variables, which consist of NPM, ROE, ROA, ART, FAT and GDP partially have no significant effect on DER, at an alpha of 0.05.

The result of this study that shows insignificant relationship between NPM and DER are different from those concluded by Siregar and Fahmi [3]. Their research on property and real estate companies on the IDX shows that NPM has a significant negative relationship with capital structure.

The relationship between ROE and DER which is not significant is in line with the results of research by Salsabila and Wibowo [13], who conducted research on Current Ratio (CR), Return On Equity (ROE), Total Asset Turnover (TATO), company size, and sales growth of modal structure, on 6 pharmaceutical companies on the IDX with data between 2013 - 2020.

The relationship between ROA and DER which is not significant is in line with the results of research by Amelia and Sunarsi[14], who conducted research on the effect of Return on Assets and Return on Equity on the Debt to Equity Ratio at PT. Kalbe Farma, Tbk, one of the health sector companies on the Indonesia Stock Exchange.

The results of this study indicate that the relationship between GDP and DER is not significant. This may be related indirectly to the nature of the health industry which spending patterns are not sensitive to GDP. Research by Rana et al.[15] on the relationship between GDP and health sector spending between 1995-2014 in 161 countries found that the income elasticity of health spending was less than 1, which explains that health is a necessity (not a luxury). If it is assumed that the Health industry tends to increase debt to respond to expansion needs, then changes in GDP will not affect the expansion needs of the health industry, due to the inelastic health spending. This result is contrary to research by Rifai and Anitawati [1], who conducted research on all companies on the Indonesia Stock Exchange in 2011 which found that changes in GDP had an effect on the Capital Structure. The difference in the duration of the study may be the reason for the difference in the results of the study.

Table 9. t-Test Results

Number of Observation				72
Wald chi2 (7)				14.51
Prob > chi2				0.0428
Y	Coef.	Std. Err.	t	P > | t |
NPM	-0.0679177	0.0575045	-1.18	0.238

ROE	0.1314775	0.4644627	0.28	0.777
ROA	-0.1639994	0.4105478	-0.40	0.690
ART	0.3735267	0.2500844	1.49	0.135
APT	-0.3402042	0.140962	-2.41	0.026
FAT	0.1261854	0.127	0.99	0.320
GDP	0.1022827	0.0945727	1.08	0.279
Cons	-0.736428	0.5113197	-1.44	0.150

Source: Adellia (2022)

The simultaneous test of the effect of all independent variables on DER as the dependent variable is shown in Table 10. The value of Prob > Chi2 is 0.0428 which indicates a lower number than the alpha value of 0.05, which means that there is a simultaneous significant effect between the variables NPM, ROE, ROA, ART, APT, FAT and GDP against DER.

Table 10. Simultaneous Test

Number of Observation	72
Wald chi^2 (7)	14.51
Prob > chi^2	0.0428

Source: Adellia (2022)

The coefficient of determination test to measure the effect of variable X on variable Y is shown in Table 11. Based on the test results, the value of R2 is 0.4623, which means the ability of the independent variable to explain the dependent variable is 46.23%, while 53.77% is explained by other factors.

Table 11. Coefficient of Determination Test

Number of obs	72
Prob > chi2	0.0000
R-squared	0.4623

Source: Adellia (2022)

4 Conclusions and recommendations

The F-test result of this study indicates that the profitability ratio, represented by ROE, ROA and NPM, efficiency ratio represented by ART, APT, FAT and GDP have a significant simultaneous effect on DER, with a coefficient of determination of 46.23%, which means this

model only explains the effect of the independent variable on the dependent variable is that percentage, and the remaining 53.77% is represented by other factors outside the model.

Partially, based on t-test, only Account Payable Turnover has a significant effect in the opposite direction to Debt to Equity Ratio. This study still finds the problem of multicollinearity in the variables RAO, ROE and NPM and the problem of autocorrelation. The next research can be done by reducing the collinearity variables and the Cochrane Orcutt transformation to overcome the autocorrelation.

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References

[1] Rivai CW. Analisis pengaruh tingkat inflasi, perubahan produk domestik bruto dan indeks harga saham gabungan terhadap stuktur modal perusahaan di Indonesia [Thesis]. Depok: Universitas Indonesia; 2011. [2] International Monetary Fund. Proyeksi pertumbuhan ekonomi dunia melambat pada 2022 [Internet]. Katadata; 2017 [Cited 2022 March 27]. Avaible from Https://databoks.katadata.co.id/datapublish/2021/10/14/imf-proyeksi-pertumbuhan-ekonomi-dunia-melambat-pada-2022

[3] Siregar H, Fahmi M. Analisis struktur aktiva, net profit margin dan current ratio terhadap capital structure pada perusahaan go publik di Bursa Efek Indonesia. Jurnal Manajemen Bisnis. 2018;30(1).

[4] Hartono AK. Pengaruh dividend payout ratio (DPR), return on assets (ROA), sales growth dan fixed assets ratio (FAR) terhadap debt equity ratio (DER) pada perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia Periode 2009-2010 [Thesis]. Yogyakarta: Universitas Atmajaya Yogyakarta; 2013.

[5] Amanda D. Pengaruh fixed asset ratio , return on asset, dan return on equity terhadap debt to equity ratio pada perusahaan tekstil dan garment yang terdaftar di Bursa Efek Indonesia periode 2013 – 2017 [Thesis]. Medan: Universitas Muhamadiyah Sumatera Utara: 2019.

[6] Jie Y. Analysis on the differences of capital structure industry of Chinese listed companies and their changing trends. In: Proceedings of the 2019 International Conference on Management Science and Industrial Engineering; 2019; Phuket, Thailand. New York: Association for Computing Machinery; 2019; p. 190-194.

[7] Hanafi MM. Manajemen keuangan. Yogyakarta: BPFE; 2008.

[8] Kasmir. Analisis laporan keuangan. Jakarta: Rajawali Pers; 2015.

[9] Ghozali I. Aplikasi analisis multivariate dengan program SPSS 23. Semarang: Badan Penerbit Universitas Diponegoro; 2016.

[10] Basuki. Analisis regresi dalam penelitian ekonomi & bisnis. Jakarta: Raja Grafindo; 2016.

[11] Sugiyono. Metode penelitian administrasi: Dilengkapi dengan metode R&D. Bandung: Alfabeta; 2017.

[12] Siagian D, Sugiarto. Metode statistika untuk bisnis dan ekonomi. In: Siagan D, Sugiarto. Metode statistika untuk bisnis dan ekonomi. Jakarta: Gramedia Pustaka Utama; 2000. p. 259.

[13] Salsabila DR, Wibowo S. Pengaruh current ratio, return on equity, total asset turnover, ukuran perusahaan dan pertumbuhan penjualan terhadap struktur modal. Research Paper Sekolah Tinggi Ilmu Ekonomi Trisakti; 2021.

[14] Amelia RW, Sunarsi D. Pengaruh return on asset dan return on equity terhadap debt to equity ratio pada PT. Kalbe Farma, TBK. Ad-Deenar: Jurnal Ekonomi dan Bisnis Islam. 2020;4(1):105-114.

[15] Rana, R. H., Alam, K., Gow, J. Health expenditure and gross domestic product: causality analysis by income level. International Journal of Health Economics and Management. Vol, (2019).