

Analysis of Factors Affecting Tax Aggressiveness in Manufacturing Companies in Indonesia

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ABSTRACT

This study aims to empirically examine the influence of profitability, capital intensity, company size, liquidity, and leverage on tax aggressiveness in manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2022. The sample includes 181 companies selected annually from a population of 209 manufacturing firms that published financial or annual reports on the IDX website during the study period. Data were extracted from these financial statements using Microsoft Excel and analyzed using E-views 10. The results indicate that profitability and leverage significantly influence tax aggressiveness, with higher profitability leading to increased tax aggressiveness, while higher leverage results in reduced tax aggressiveness. On the other hand, capital intensity, company size, and liquidity were found to have no significant effect on tax aggressiveness. These findings suggest that firms with higher profits are more inclined to engage in tax planning strategies to minimize tax liabilities, whereas firms with higher debt levels may be constrained in their ability to do so due to the associated costs and risks. In conclusion, the study provides valuable insights for policymakers and stakeholders in understanding the factors that drive tax aggressiveness in the manufacturing sector. The results highlight the need for more stringent regulations and oversight, particularly for highly profitable companies, to curb aggressive tax planning practices.

Keywords: profitability, capital intensity, company size, liquidity, leverage, and tax aggressiveness

INTRODUCTION

Taxes are one of the largest sources of revenue in Indonesia's State Revenue and Expenditure Budget (APBN), as stated by Anggraini & Widarjo (2024), who stated that taxes are a very important national revenue. The Government of Indonesia continues to strive to increase the realization of tax revenue every year by setting an increase target in the tax sector. However, the achievement of tax revenue targets is often not achieved, except in 2021, where the realization of tax revenue managed to exceed the target (Ramzan et al., 2023).

The study highlights new factors such as profitability, capital intensity, company size, liquidity, and leverage that have not been discussed comprehensively in relation to tax aggressiveness in Indonesia (Saragih & Ali, 2024). The focus on the pandemic period, where there was a surge in profits of global technology companies such as Google, Facebook, and Microsoft, adds a new dimension to this analysis, especially regarding minimal tax contributions amid large profits (Magalhães & Christians, 2020).

Although several previous studies have explored factors such as leverage, liquidity, and capital intensity, there have not been many studies that specifically examine the influence of a combination of these factors, including profitability and company size, on tax aggressiveness, especially in Indonesia. In addition, there has been no research that specifically highlights the impact of the pandemic on the dynamics of tax aggressiveness of multinational companies in Indonesia (Athira & Ramesh, 2023).

This study aims to provide empirical evidence regarding the influence of profitability, capital intensity, company size, liquidity, and leverage on tax aggressiveness in Indonesia (Darsani & Sukartha, 2021). With a focus on the pandemic period, the study also aims to explore how large companies, especially in the technology sector, play a role in the dynamics of tax aggressiveness.

This research is expected to make an important contribution to the development of literature related to tax aggressiveness, especially in Indonesia (Hajawiyah et al., 2022). For practitioners and policymakers, the results of this study can provide insight into the factors that affect tax aggressiveness, which can be used as a basis for the formulation of more effective tax policies. In addition, this research is also expected to help investors in understanding the factors that affect tax aggressiveness, so that they can make wiser investment decisions (Balakrishnan et al., 2019).

RESEARCH METHODS

The method used in this study is quantitative data analysis. Data from the company's financial statements was collected using Microsoft Excel software and processed using the E-views 10 program. To test the influence of independent variables on dependent variables, this study uses multiple regression analysis for panel data. The tests used to analyze the data are Descriptive Statistics and panel Data Regression Analysis, proposed by Karnadi (2019), where there are 3 ways to determine the research model for panel data, namely Pooled Least square (PLS), Fixed Effect, Random Effect, in choosing the best among the three, Karnadi revealed that 2 types of tests can be carried out, namely the Chow Test or Likelihood Ratio and the Hausman Test; then the Hypothesis Test.

Population and Sample

The population of this study is all manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2020-2022. Sampling was carried out using the purposive sampling method. The data that became the sample was selected based on certain criteria because not all companies in the population have criteria that are in accordance with the objectives of this study (Ghauri et al., 2020). The criteria used are manufacturing companies that are listed on the IDX consecutively during 2020-2022, submit Financial Statements during 2020-2022, have not suffered losses in any of the research periods, and have all the data to be tested in this study. This research uses secondary data, which refers to historical reports that have been published by the Indonesia Stock Exchange. In this study, linear regression analysis is used as follows:

Y = a + b1 X1 + b2 X2 + b3 X3 + b4 X4 + b5 X5 + b6 X6 + e....(1)

Information:

- Y = tax aggressiveness
- a = constant
- X1 = profitability
- X2 = Capital Intensity
- X3 = company size
- X4 = liquidity

X5 = leverage

RESULTS AND DISCUSSION

Description of Research Sample

The population of this study sample is manufacturing sector companies that are listed on the Indonesia Stock Exchange (IDX) and publish financial statements and/or annual financial statements on the Stock Exchange website from 2020 to 2022.

	Table 1.						
Research Sample							
No.	Sample Criteria	Total Company	Total Data				
1	Manufacturing companies that are consistently						
	listed on the Indonesia Stock Exchange (IDX) in	209	627				
	2020-2022						
2	Companies that do not have a CETR (Current	(29)	(94)				
	<i>Effective Tax Rate</i>) value of <0 and >1	(28)	(84)				
	Number of Research Samples	181	543				
	Source: Data Collection Results from the Indone	sia Stock Exchange	(IDCY)				

Source: Data Collection Results from the Indonesia Stock Exchange (IDCX)

The total number of manufacturing companies listed on the Indonesia Stock Exchange from 2020 to 2022 is 209 companies. Of the 209 companies, there are 28 companies that do not meet the criteria, so the total sample in this study is 181 companies for each year. **Descriptive Statistics**

Results of Descriptive Statistical Analysis								
	ETR ROA CI SIZE LIQ LEV							
Mean	0.261626	0.066890	0.504841	28.92518	2.830922	0.39086		
Median	0.223450	0.054130	0.483650	28.84354	1.958380	0.36712		
Maximum	2.900910	0.363620	4.475250	33.65519	48.11458	0.85820		
Minimum	-0. 161930	-0.379590	0.000360	25.07900	0.007200	0.00248		
Std. Dev.	0.247437	0.065685	0.410490	1.724951	3.230638	0.19432		
Skewness	5.588690	0.594507	3.351510	0.177247	6.561449	0.22614		
Kurtosis	52.28836	9.331159	31.23785	2.515304	77.99218	2.30404		

Table 2.Results of Descriptive Statistical Analysis

Ferry Adang, Amin Wijoyo

Jarque-Bera	57790.49	938.8770	19057.18	8.158502	131135.3	15.5866
Probability	0.000000	0.000000	0.000000	0.016920	0.000000	0.00041
Sum	142.0627	36.32120	274.1288	15706.38	1537.191	212.241
Sum Sq. Dev	33.18395	2.338461	91.32814	1612.698	5656.864	20.4675
Observations	543	543	543	543	543	543

Date: 07/16/24

Time: 19:15

Sample: 2020 2022

Table 2. shows that tax aggressiveness has a maximum value of 2.90 and a minimum value of -0.16, a mean of 0.26 and a standard deviation of 0.24. Profitability (ROA) has a maximum value of 0.36 and a minimum value of -0.37, a mean of 0.06 and a standard deviation of 0.06. Capital Intensity (CI) has a maximum value of 4.47 and a minimum value of 0.00, with a mean of 0.50 and a standard deviation of 0.41. The company size (SIZE) has a maximum value of 33.65 and a minimum value of 25.07, with a mean of 28.92 and a standard deviation of 1.72. Liquidity has a maximum value of 48.11 and a minimum value of 0.00, with a mean of 2.83 and a standard deviation of 0.29 and a standard deviation of

Data Analysis and Discussion

This study uses panel data, and processing is carried out using E-views 10.

1) Panel Data Regression Analysis

Multiple linear regression analysis with panel data was carried out to obtain empirical evidence of the extent of the influence of profitability, capital intensity, company size, liquidity, and leverage on tax aggressiveness. Karnadi (2019) proposed 3 ways to determine the research model for panel data, namely:

a) Pooled Least square (PLS)

Pooled Least square (PLS) is often also referred to as the Common Effect. This model estimates panel data using the Ordinary Least Square (OLS) method. Testing is carried out without looking at the difference in time and individuals (Raffle et al., 2019). The test was carried out by combining data from both time series and cross-section with the assumption that the data behaviour between companies was the same in various time periods (Koijen et al., 2017). The same effect will be obtained even if there is a change in the independent variable.

Table3.
Results of panel data regression analysis – Pooled Least Square (PLS)

Dependent Variable: ETR
Method: Panel Least Squares
Date: 07/16/24 Time: 19:15
Sample: 2020 2022
Periods included: 3

Cross-sections included: 181							
Total panel (balanced) observations: 543							
Coefficient	Std. Error	t-Statistic	Prob.				
-0.655726	0.160091	-4.095962	0.0000				
-0.006485	0.025558	-0.253721	0.7998				
-0.007688	0.006259	-1.228426	0.2198				
-0.008176	0.003355	-2.437180	0.0151				
-0.099207	0.053677	-1.848222	0.0651				
0.593066	0.185686	3.193917	0.0015				
0.052991	Mean depende	ent var	0.261626				
0.044173	S.D. depender	nt var	0.247437				
0.241910	Akaike info ci	riterion	0.010487				
S.E. of regression0.241910Sum squared resid31.42550		Schwarz criterion					
3.152782	Hannan-Quinn criter.		0.029053				
6.009674	Durbin-Watson stat		1.513391				
0.000020							
	l) observations Coefficient -0.655726 -0.006485 -0.007688 -0.008176 -0.099207 0.593066 0.052991 0.044173 0.241910 31.42550 3.152782 6.009674	I) observations: 543 Coefficient Std. Error -0.655726 0.160091 -0.006485 0.025558 -0.007688 0.006259 -0.008176 0.003355 -0.099207 0.053677 0.593066 0.185686 0.052991 Mean depender 0.044173 S.D. depender 0.241910 Akaike info cr 31.42550 Schwarz criter 3.152782 Hannan-Quint 6.009674 Durbin-Watsco	I) observations: 543 Coefficient Std. Error t-Statistic -0.655726 0.160091 -4.095962 -0.006485 0.025558 -0.253721 -0.007688 0.006259 -1.228426 -0.008176 0.003355 -2.437180 -0.099207 0.053677 -1.848222 0.593066 0.185686 3.193917 0.052991 Mean dependent var 0.044173 S.D. dependent var 0.241910 Akaike info criterion 31.42550 Schwarz criterion 3.152782 Hannan-Quinn criter. 6.009674 Durbin-Watson stat				

Source: Data processed with E-views 10 (2024)

b) Fixed Effect

The fixed effect model technique adds dummy variables to allow changes in the intercept so that differences occur between companies (Breuer & Dehaan, 2024). The results will have a different impact if there is a change in the independent variable.

Results of panel data regression analysis – Fixed Effect							
Dependent Variable: ETR							
Method: Panel Least Squares							
Date: 07/16/24 Time: 19:16							
Sample: 2020 2022							
Periods included: 3							
Cross-sections included: 181							
Total panel (balanced) observation	s: 543						
Variable	Coefficient	Std. Error	t-Statistic	Prob.			
ROA	-1.025075	0.277308	-3.696521	0.0003			
CI	-0.094601	0.045100	-2.097564	0.0366			
SIZE	0.054165	0.081839	0.661856	0.5085			
LIQ	-0.008750	0.004548	-1.923941	0.0552			
LEV	-1.194661	0.141670	-8.432694	0.0000			
С	-0.697066	2.362936	-0.295000	0.7682			
	Effects Spe	ecification					
Cross-section fixed (dummy variab	oles)						
R-squared	0.539539	Mean depende	ent var	0.261626			
Adjusted R-squared	0.300925	S.D. depender	nt var	0.247437			
S.E. of regression	0.206884	Akaike info ci	riterion	-0.047610			
Sum squared resid	15.27992	Schwarz criter	rion	1.424328			
Log likelihood	198.9262	Hannan-Quin	n criter.	0.527922			
F-statistic	2.261135	Durbin-Watso	on stat	2.616012			

Table 4. Results of panel data regression analysis – Fixed Effect

Prob(F-statistic)

0.000000

Source: Data processed with E-views 10 (2024)

c) Random Effect

This model is a variation of the Generalized Least Square (GLS) model where problems posed in PLS or Common Effect can be fixed (Sarstedt et al., 2016).

Results of panel data regression analysis – Random Effect								
Dependent Variable: ETR								
Method: Panel EGLS (Cros	Method: Panel EGLS (Cross-section random effects)							
Date: 07/16/24 Time: 19:16		·						
Sample: 2020 2022								
Periods included: 3								
Cross-sections included: 18	1							
Total panel (balanced) obse	rvations: 543							
Swamy and Arora estimator	of component	variances						
Variable	Coefficient	Std. Error	t-Statistic	Prob.				
ROA	-0.712309	0.164989	-4.317308	0.0000				
CI	-0.016587	0.026430	-0.627579	0.5305				
SIZE	-0.007778	0.006970	-1.115871	0.2650				
LIQ	-0.008076	0.003317	-2.434570	0.0152				
LEV	-0.175923	0.058120	-3.026913	0.0026				
С	0.634244	0.206078	3.077682	0.0022				
	Effects Sp	ecification						
			S.D.	Rho				
Cross-section random			0.101865	0.1951				
Idiosyncratic random			0.206884	0.8049				
	Weighted	l Statistics						
R-squared	0.059035	Mean dependent	var	0.199065				
Adjusted R-squared	0.050274	S.D. dependent	var	0.224637				
S.E. of regression	0.218917	Sum squared res	id	25.73563				
F-statistic	6.738191	Durbin-Watson	stat	1.806980				
Prob(F-statistic)	0.000004							
	Unweighte	d Statistics						
R-squared	0.048688	Mean dependent	var	0.261626				
Sum squared resid	31.56829	Durbin-Watson	stat	1.473117				
Common	D-4	I with E winner 1	0 (2024)					

 Table 5.

 Results of panel data regression analysis – Random Effect

Source: Data processed with E-views 10 (2024)

To find the best model between common effect, fixed effect, and random effect, 2 types of tests are used (Karnadi, 2019):

1) Chow or Likelihood Ratio Test

The Chow test aims to determine the best model between a common effect or fixed effect with hypotheses:

H0: Model common effect H1: Fixed effect model

If the significance probability value F > 0.05, then H0 is accepted, which means the best model is a common effect model. If F < 0.05, then the best model is a fixed effect.

	Table 6.		
C	how Test Results		
Effects Test	Statistics	D.F.	Prob.
Cross-section F	2.095698	(180,357)	0.0000
Cross-section Chi-square	391.546747	180	0.0000
Source: Data pr	paged with E wi	10(2024)	

Source: Data processed with E-views 10 (2024)

Based on Table 4.6 above, the F value is 0.00, which means < 0.05, so the best model is a fixed effect.

2) Hausman Test

This test is to determine the best model between a random effect or fixed effect with a hypothesis:

H0: Model random effect H1: Fixed effect model

To find out the chosen hypothesis, it is necessary to see the statistical value of chi-square with a probability of > 0.05, then H0 is accepted. This means that the best model is a random effect. However, if the probability value of F significance is < 0.05, then the best model is a fixed effect.

Table 7.						
Hausman Test Results						
Test	Chi-Sq.	Chi-Sq.				
Summary	Statistics	D.F.	Prob.			
Cross-section random	69.287366	5	0.0000			
Source: Data processed with $F_{-views} = 10 (2024)$						

Source: Data processed with E-views 10 (2024)

Based on table 7 above, the significance value of F is 0.0000 which means < 0.05, so it can be concluded that the best model is fixed effect.

3) Panel Data Regression Test Results

		r	Fable 8.			
	Panel Data Regression Test Results					
_	Variable	Coefficient	Std. Error	t-Statistic	Prob.	
	ROA	-1.025075	0.277308	-3.696521	0.0003	
	CI	-0.094601	0.045100	-2.097564	0.0366	

Ferry Adang, Amin Wijoyo

_					
	SIZE	0.054165	0.081839	0.661856	0.5085
	LIQ	-0.008750	0.004548	-1.923941	0.0552
	LEV	-1.194661	0.141670	-8.432694	0.0000
	С	-0.697066	2.362936	-0.295000	0.7682
_					

Source: Data	processed with E-viev	vs 10	(2024)
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Information:

Y = tax aggressiveness (ETR) a = constant X1 = profitability (ROA) X2 = Capital Intensity (CI) X3 = company size (SIZE) X4 = liquidity (LIQ)

X5 = leverage (LEV)

Table 8 above shows the regression equation of the panel data between the independent variable and the dependent variable as follows:

 $ETR = -0.69 - 1.02X1 - 0.09X2 + 0.05X3 - 0.00X4 - 1.19X5 + \epsilon$

From the linear regression equation above, it can be concluded as follows:

- a. Constant (α) = -0.69 means that if the variables of profitability, capital intensity, company size, liquidity, and leverage are 0, then the effective tax rate is -0.69.
- b. The regression coefficient of the profitability variable = -1.02 means that if the profitability variable increases by 1 unit, the effective tax rate variable will decrease by 1.02, with other independent variables considered to be zero.
- c. The regression coefficient of the capital intensity variable = -0.09 means that if the capital intensity variable increases by 1 unit, the effective tax rate variable will decrease by 0.09, with other independent variables considered to be zero.
- d. The regression coefficient of the company size variable = 0.05 means that if the company size variable increases by 1 unit, the effective tax rate variable will increase by 0.05, with other independent variables considered to be zero.
- e. The regression coefficient of the liquidity variable = -0.00 means that if the liquidity variable increases by 1 unit, the effective tax rate variable will decrease by 0.00, with other independent variables considered to be zero.
- f. The regression coefficient of the leverage variable = -1.19 means that if the leverage variable increases by 1 unit, the effective tax rate variable will decrease by 1.19, with other independent variables considered to be zero.
- 4) Hypothesis Test Results

Test F

Test F aims to test the feasibility of a research model. The significance level used is 0.05 (Karnadi, 2017). If the significance value < 0.05, then H0 is rejected, while if it is the other way around, then H0 is accepted.

Table 9. Test Results F

Dependent Variable: ETR Method: Panel Least Squares Date: 07/16/24 Time: 19:16 Sample: 2020 2022 Periods included: 3 Cross-sections included: 181 Total panel (balanced) observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	-1.025075	0.277308	-3.696521	0.0003
CI	-0.094601	0.045100	-2.097564	0.0366
SIZE	0.054165	0.081839	0.661856	0.5085
LIQ	-0.008750	0.004548	-1.923941	0.0552
LEV	-1.194661	0.141670	-8.432694	0.0000
С	-0.697066	2.362936	-0.295000	0.7682
	Effects Spe	ecification		
Cross-section fixed (dumr	ny variables)			
R-squared	0.539539	Mean depende	nt var	0.261626
Adjusted R-squared	0.300925	S.D. dependen		0.247437
S.E. of regression	0.206884	Akaike info crite	erion	-0.047610
Sum squared resid	15.27992	Schwarz criteri	on	1.424328
Log likelihood	198.9262	Hannan-Quinn	criter.	0.527922
F-statistic	2.261135	Durbin-Watson	stat	2.616012
Prob(F-statistic)	0.000000			

Source: Data processed with E-views 10 (2024)

Based on Table 4.9 above, the Prob value (F-Statistic) in the F test is 0.000 and less than α (0.05), so the regression model is fit and feasible to be used in this study.

Test t

The t-test was used to test whether partially the independent variable had a significant effect on the dependent variable (Liu & Wang, 2021). The test uses a significance level of 0.05. If the significance value < 0.05, then Ho is rejected, and if it is the other way around, then Ho is accepted (Karnadi, 2017).

		,	Table 10.			
Test Results						
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Decision	Conclusion
					H1	Negative
ROA	-1.025075	0.277308	-3.696521	0.0003	accepted	influence

					H2	Negative
CI	-0.094601	0.045100	-2.097564	0.0366	accepted	influence
SIZE	0.054165	0.081839	0.661856	0.5085	H3 rejected	No effect
LIQ	-0.008750	0.004548	-1.923941	0.0552	H4 rejected	No effect
					H5	Negative
LEV	-1.194661	0.141670	-8.432694	0.0000	accepted	influence

Source: Data processed with E-views 10 (2024)

Based on Table 10 above, it can be concluded that the influence of partial variables is as follows. The profitability variable (ROA) has a value of 0.0003. This value is less than α (0.05) so it can be concluded that profitability (ROA) has a negative effect on the effective tax rate and H1 is accepted. The coefficient value of ROA of -1.02 proves that ROA has a negative effect on the effective tax rate. The capital intensity (CI) variable has a value of 0.0366. The value is less than α (0.05), so it can be concluded that capital intensity has a negative effect on the effective tax rate, and H2 is accepted. The coefficient value of the CI variable of -0.09 shows that capital intensity has a negative effect on the effective tax rate. The variable company size (SIZE) has a value of 0.5085. This value is greater than α (0.05), so it can be concluded that the size of the company has no effect on the effective tax rate, and H3 is rejected. The liquidity variable (LIQ) has a value of 0.0552. This value is greater than α (0.05), so it can be concluded that the liquidity variable (LIQ) has no effect on the effective tax rate, and H4 is rejected. The leverage variable (LEV) has a value of 0.0000. The value is smaller than α (0.05), so it can be concluded that the leverage variable (LEV) has a negative effect on the effective tax rate, and H5 is accepted. The coefficient value of the LEV variable of -1.19 indicates that leverage has a negative effect on the effective tax rate. **Determination Coefficient Test (Adjusted R square)**

This test is used to show the determination coefficient between two or more independent variables to the dependent variable (Koijen et al., 2017). An adjusted R2 value close to 1 indicates the ability of independent variables to predict the variation of dependent variables in great detail because almost all the information needed is provided (Karnadi, 2019).

Based on table 4.9 above, it can be concluded that the level of influence (R Square) of the variables profitability (ROA), capital intensity (CI), company size (SIZE), liquidity (LIQ), leverage (LEV) together has an influence of 30.09% on the effective tax rate variable, while the remaining 69.91% is influenced by other variables outside the study.

The research with the title Analysis of Factors Affecting Tax Aggressiveness in Manufacturing Companies in Indonesia was conducted with the aim of obtaining empirical evidence on the influence of profitability, capital intensity, company size, liquidity, and leverage on the effective tax rate (Gunawan & Mappadang, 2024). In this study, the sample taken was 181 manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2020-2022, and a

sample of 543 companies was obtained, bringing the total to 543 financial statements (Febriana et al., 2024).

The results of this study stated that profitability had a significant negative influence on the effective tax rate. The results of this study are in line with research conducted by Wenny and Yohanes (2021) and Lemuel and Sukadana (2022)

The results of this study stated that capital intensity had a significant negative influence on the effective tax rate (Sanyora & Safitri, 2023). The results of this study are in line with the research conducted by Muzaimi and Parinduri (2022). This proves that the greater the company's investment in fixed assets will result in a decrease in the company's tax aggressiveness.

The results of this study state that the size of the company has no effect on the effective tax rate. The results of this study are in line with research conducted by Lemuel and Sukadana (2022). The results of this study state that liquidity has no effect on the effective tax rate. The results of this study are in line with research conducted by Lemuel and Sukadana (2022). This supports the idea that the size of the company is not a factor that results in the increase in tax aggressiveness. The results of this study stated that leverage had a significant negative effect on the effective tax rate. The results of this study are in line with research conducted by Lemuel and Sukadana (2022). This supports the idea that leverage is a factor that hinders a company's tax aggressiveness.

CONCLUSION

This study successfully demonstrates the empirical impact of profitability, capital intensity, company size, liquidity, and leverage on the effective tax rate of manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2022. An analysis of 543 data points from 181 companies revealed that profitability, capital intensity, and leverage negatively affect the effective tax rate, while company size and liquidity have no significant effect. These findings align with previous research there by reinforcing existing literature on the determinants of effective tax rates in the manufacturing sector.

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