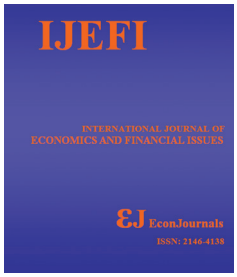

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The Effect of Leverage and Firm Size to Profitability of Public Manufacturing Companies in Indonesia

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ABSTRACT

This study aimed to analyze the effect of leverage and the size of a company to its profitability. Data were obtained from the financial statements of 100 qualified manufacturing companies listed in Indonesia Stock Exchange in the period of 2009-2014. Leverage was measured by debt ratio, while firm size was measured by total assets and total sales, and profitability by return on assets. Panel data regression analysis was implemented to analyze the influence of independent variables to the dependent variable. The most suitable panel data regression model in this study was a fixed effect model. The study found that the debt ratio had a significant positive effect on profitability while total assets had a significant negative impact. In contrast, total sales had statistically insignificant effect to the profitability of the companies.

Keywords: Leverage, Firm Size, Profitability
JEL Classification: M210

1. INTRODUCTION

One of business objectives is to deliver economic benefits to its owner(s) or shareholder(s). Business organization can only provide this benefit when it performs well financially. Generally, the performance of a company is seen through its financial statements because the statements reflect the activities carried out by the company in and up to a given period.

Using financial statements, owner(s) and management know the company's current potential so that they are able to plan and make the right decisions about what to do next. Financial statements have been used as data base for a stakeholder on which she wishes to cover the company's existing weaknesses, maintain the position that has been achieved, and strive to improve the benefits she expects to enjoy. A company usually brings dividend benefits to shareholders when it produces enough profits to distribute. Thus, profit is very important not only to managers but also owners. That is why a large number of study put a lot of attention in profitability aside of other financial performance parameter such as liquidity, activity and solvability ratios.

In this paper, the authors use profitability ratio, i.e., return on assets (ROA) to represent financial performance of a company. Profitability is the company's ability to generate profits for a certain period. The higher the profitability ratio, the higher the profits that a company generates in that period.

A company generates profits by operating the business it is capable of. In conducting its operational activity, the company needs funding's to run properly. The fund must be available in a certain amount so that it is enough to used when needed and not too much where it would be idle and considered lost potential.

One source of funding is debt. According to Shamsuddin (2011), shareholders and creditors as should pay attention to the amount of debt owed and the company's ability to pay interest and principal. The larger the debt, the greater the likelihood of a company not being able to repay its debt.

When comparing the debt of one company to that of others, leverage ratio is frequently used. The leverage ratio or also known as the solvency ratio is used to measure the extent of the company's assets that are financed by debt (Kasmir, 2014). Debt

ratio is the ratio between total liabilities and total assets. This ratio measures how much the company's assets are financed by creditors. According to Kouser et al. (2011), the debt ratio has positive and significant influence to the profitability of a company.

Like debt ratio, the size of the companies has positive influence to their profitability (Prasanjaya and Ramantha, 2013; Akbas and Karaduman, 2012). The size of a company may be reflected by production capacity when it is a manufacturing company or variety of services when it is a service company. However, Niresh and Velnampy (2014), Prasanjaya and Ramantha (2013), Akbas and Karaduman (2012) said that a company is considered to be large or small when we take into account its total assets and total sales. Devi and Devi (2014) and Singapurwoko and El-Wahid (2011) found that the size of a company correlated positively to profitability.

This study aims to analyze the level of leverage, the size, and the profitability of public manufacturing companies in Indonesia. More substantially, this study aims to determine the influence of the size of companies and their leverage to profitability using the most-updated data and panel data technique.

2. LITERATURE REVIEW

Devi and Devi (2014) identified the determinants of profitability of companies in Pakistan. Variables analyzed in their study were the structure of capital, financial leverage, firm size, and profitability. The data were collected from 50 companies in 7 years. The results showed that there was a positive correlation between financial leverage and profitability, as well as firm size and profitability. They also found that capital structure was negatively correlated to profitability.

Dogan (2013) examined the effect of the size of the company to profitability. Data were collected from 200 companies from 2008 to 2011 by implementing multiple regression analysis method. He stated that there was a positive relationship between firm size and profitability. But when he used leverage and the age of the company as controlling variables, he found that in contrast with previous study, the relationship between firm size and profitability was negative.

Prasanjaya and Ramantha (2013) analyzed the effect of capital adequacy ratio (CAR), return on assets (ROA), loans to deposits ratio (LDR), and the size of the company to profitability of banks listed on the Indonesian Stock Exchange. They found that CAR, ROA, LDR, and the size of the company had significant effect on profitability simultaneously. While partially, CAR and ROA had significant effect on profitability, the LDR and the size of the company showed no significant significant effect on profitability. This research used data in the period of 2008 to 2011 by using multiple regression analysis.

Akbas and Karaduman (2012) examined firm size and profitability. They used panel data from public manufacturing companies in Turkey in 2005-2011 period. Their research showed that the size of the company had positive and significant effect on profitability.

Singapurwoko and El-Wahid (2011) examined non-financial companies listed In Indonesia Stock Exchange (IDX) and their industry factors, operational decisions that were proxied by total asset turnover, the firm size measured by total assets, and macroeconomic variable measured by the BI rate. They showed that industry factors, firm size and operational decisions had significant positive effect on profitability. However, no significant effect had been found for macroeconomic variable on profitability.

2.1. Leverage

In a broad sense, the solvency ratio is used to measure a company's ability to pay all its obligations, both short-term and long-term ones, especially when it is dissolved (liquidated). According to Hanafi and Halim (2007), a high debt ratio means that the company' financial leverage is also high. On one's hand, the higher debt ratio, the higher the level of uncertainty of gaining returns expected by shareholders. But on the others' hand, when used deliberately, financial leverage increase the returns for shareholders.

2.2. Company Size

The size of company may be measured by total assets, total sales, number of employees, and market capitalization. The bigger a company, the more easily it garners outside capital, the larger its capital, the bigger it will be and so on. An investor is interested in companies that provide high returns, so he would invest his capital. The availability of these funds from investor's capital make companies easier to exercise investment opportunities.

2.3. Profitability

ROA measures the extent to which the assets of the company are able to generate profits. This ratio measures the company's ability to generate net income under a certain level of assets. This study analyzes the profitability as measured by ROA. A high ROA means a high efficiency of the wealth management (asset), which means a high efficiency of management (Hanafi and Halim, 2007).

3. METHODOLOGY

This research uses secondary data from financial statements of 100 manufacturing companies listed in IDX from 2009 until 2014. Sample companies are selected among those that consistently exist on IDX's list for 6-year period and consistently report their financial statements. Leverage is measured by debt ratio. Firm size is measured by the natural logarithm of total assets and the natural logarithm of total sales. Profitability is measured by ROA where net income is divided by total assets.

Software SPSS 22.0 is used for classical assumption tests and E-Views 8.1 is for panel data regression. First, we confirmed that data passed classical assumption tests. Second, we selected the best panel data regression model. Panel data regression consists of three models, namely common effect, fixed effect and random effect. To choose the best model model(s), we conducted three tests that is Chow, Hausman, and LM test. Chow test is usually implemented to select the best model among common effect and fixed effect. Hausman test is to select the best model among fixed effect and random effect. While the LM test is to select between common effect and random effect model. Last, we conducted panel data regression and concluded the model output.

4. RESULTS AND DISCUSSIONS

4.1. Measures of Central Tendency

Table 1 below describes statistics parameters on 6-year-data of manufacturing companies listed on the Indonesian Stock Exchange. The profitability of manufacturing companies that viewed from return on assets parameter shows that there are at least 10% of companies that are not able to produce profits or state loss. On the contrary, there are companies that are able to generate great profits, one company achieves net income of 1.39 of total assets. The average ROA of manufacturing companies in Indonesia is 6.8%. Consumer goods industry sub-sector has the highest ROA reaching 12.1% of other sub-sectors within manufacturing companies. Half of the manufacturing companies underperform the industry ROA average. More than 25% of the manufacturing companies outperform the industry ROA average at about 10.8% per year. However, the standard deviation between companies is quite high reflecting that profitability varies greatly between manufacturing companies.

The average debt ratio is 0.549 which is quite high. Lynch (1989) only invests in companies with debt ratios under 0.25, thus Lynch would only invest in <25% of Indonesian manufacturing companies. Half of the manufacturing companies have debt less than their capital, and the other half have more debt than their capital. Because of their high debt ratio, manufacturing companies may not be very interesting to investors. Investors would consider that the higher debt ratio, the higher the risk they would have to take into account when the company has difficulties to pay its debts.

Manufacturing companies in Indonesia are of diverse sizes. Judging from total assets owned, the smallest company is that with only Rp. 11 billion and the biggest one is that with Rp. 236,029 billion. However, the smallest and the largest one come from different sectors. The smallest company is from basic industry and chemical sector, while the highest one is from other industrial sectors. Overall, the average total assets is Rp. 6,667.36 billion and the average total sales is Rp. 6,822.71 billion.

4.2. Panel Data Regression

Classical assumptions must be met in order to obtain a good regression model. A good regression model is considered free of multicollinearity once VIF value is <10 and tolerance value is >0.10 (Ghozali, 2012). Table 2 that is summarized from SPSS output shows that the three independent variables in this study is free of multicollinearity because VIF values of all variables are <8 and tolerance values are >0.10.

A good regression model should also be free of heterocedasticity and autocorrelation. In this research, data are said to be free of heterocedasticity and autocorrelation when probability of Chi-square is >0.05 (Winarno, 2007). Table 3 shows that the probability of Chi-square of White test is 0.0649 which is >0.05, thus we accept that the regression data model is free of heterocedasticity. The Table 3 shows that the probability of Chi-square of LM test is 0.1396 which is >0.05, thus we accept that the regression data model is free of autocorrelation.

To choose the best model between common effect and fixed effect model, we conducted Chow test. Table 4 shows that the probability of cross-section F is <0.05, thus the model chosen is a fixed effect.

The Table 5 shows that the probability of cross-section random is <0.05. Thus, the model chosen is a fixed effect.

Last test to choose the best model is LM test. LM test is done by calculating the value of LM. After calculation, we obtained 0.00000000007196 as $LM_{calculated}$. $LM_{calculated}$ is compared with the value of Chi-square table under 3 degrees of freedom and significance level of 5%, that is, 7.815. Because 0.00000000007196 far <7.815, thus the appropriate model is a common effect. The results of the three tests are in Table 6.

Table 1: Descriptive statistics

Statistics	Variables			
	Ratio		Billion rupiahs	
	ROA	LEV	Size_Total assets	Size_Total sales
Mean	0.068	0.549	6667.36	6822.71
Median	0.005	0.490	1296.50	1574.50
Maximum	1.39	4.56	236029	201701
Minimum	−0.75	0.04	11	2
SD	0.125	0.470	19978.042	18536.811
Percentile 10	−0.015	0.200	215.00	219.30
25	0.016	0.310	559.00	583.75
50	0.005	0.490	1296.50	1574.50
75	0.108	0.630	3680.00	4330.00
N	600	600	600	600

ROA: Return on assets, LEV: Leverage, SD: Standard deviation

Table 2: Multicollinearity test results

Coefficients	Collinearity statistics	
Model	Tolerance	VIF
lnLEV	0.969	1.032
SIZE_lnAssets	0.141	7.081
SIZE_lnSales	0.140	7.164

Table 3: Heterocedasticity and autocorrelation tests results

Test type	Probability Chi-square	Obs *R^2
Heteroskedasticity Test: White	0.0649	7.228939
Breusch-Godfrey Serial Correlation LM Test	0.1396	0.459575

Table 4: Chow test

Effects test	Statistic	Probability
Cross-section F	4.924523	0.0000

Redundant fixed effects tests on panel data, test cross-section fixed effects

Table 5: Hausman test

Test summary	Chi-square statistic	Chi-square d.f.	Probability
Cross-section random	38.004799	3	0.0000

Correlated random effects - Hausman test on panel data, test cross-section random effects. d.f.: Degrees of freedom

Of the three tests above, we selected the most dominant results. Therefore, we concluded that the best model is fixed effect model. Using Eviews, we obtained the following output as shown in Table 7.

Table 7 above shows the coefficient of determination (Adjusted R^2) of 0.50399 indicates that the model explains 50.399% of the variability of profitability, while the remaining 49.601% of profitability variance should be explained by other variables which do not exist in the regression model. Table 7 also exhibits that lnleverage, size_lnassets, and size_lnsales variable have significant effect on profitability simultaneously as concluded from the probability value (F-statistics) of 0.00 ($P < 0.05$).

However, when we look at each variable partially, we concluded that only debt ratio and total assets influence the profitability of manufacturing companies in Indonesia. This conclusion is based on the probability value (t-statistics) of 0.0013 for debt ratio and 0.0001 for total assets. The other variable, which is total sales, has insignificant effect on profitability because its probability value (t-statistics) is >5% amount 0.1083.

The result of this paper that indicates a negative relation between total assets and profitability of firms (ROA) is logically accepted because ROA's denumerator is total assets, thus the more total assets held by a company, the lower ROA it scores assuming constant net income. However, the finding of this study is actually contradictary with that of Dogan (2013), Akbas and Karaduman (2012), Devi and Devi (2014), and Prasanjaya and Ramantha (2013) that indicate positive influence. They argue that the more assets a company has, the more income it is able to generate by utilizing more assets, and the higher its profitability will be. Other researches state indecisive finding, like Niresh and Velnampy (2014) who claims there is no indicative relationship between the two variables, i.e., ROA and total assets, assuming that some companies may not consider their assets too much in generating profits. Hence, this study enriches the literature of relationship between firm size and profitability by proving its negative relationship.

Table 6: Tests to select the best model

Test type	Choose between	Decision
Chow test	Common effect and fixed effect	Fixed effect
Hausman test	Random effect and fixed effect	Fixed effect
LM test	Common effect and random effect	Common effect

Table 7: Panel data regression (Fixed effect model)

Variable	Coefficient	Standard error	t-statistic	Probability
C	0.362817	0.089364	4.059982	0.0001
LNLEV?	0.043107	0.013302	3.240699	0.0013
SIZE_LNASSETS?	−0.059281	0.014771	−4.013472	0.0001
SIZE_LNSALES?	0.023811	0.014799	1.608987	0.1083
Effects Specification - Cross-section fixed (dummy variables)				
R^2	0.588460	F-statistic		6.967237
Adjusted R^2	0.503999	Prob (F-statistic)		0.000000

Regression method is pooled least squares with 600 pool (balanced) observations

Further this study reveals that debt ratio has positive relationship with firm's profitability. This finding is consistent with that of Devi and Devi (2014) and Singapurwoko and El-Wahid (2011). Although other studies reveal otherwise such as Vinasithamby (2015). We believe that debt ratio can improve firm's profitability when debt is managed by the company as efficiently as possible to generate profits. But when a company takes too much debt and it cannot manage it well, it will come to a point where it pays too much interests on debt, thus substracting its profits. This is the point where debt ratio will have an adverse effect on profitability. In Vinasithamby (2015), the hotels and travels sector firms in Sri Lanka might have come to a point where their debts decrease the efficiency of operations. On the other hand, even though Indonesian manufacturing firms have high debt ratio averaging 54.9%, they are still able to manage their debts efficiently to produce profits.

Last, this research finds that total sales have no significant effect on profitability. This result is similar with that of Niresh and Velnampy (2014) but contradictary to those of Dogan (2013), Akbas and Karaduman (2012), Devi and Devi (2014), and Prasanjaya and Ramantha (2013) that indicate a significant positive influence. Hypothetically, profitability and sales are related because profitability comes from profits, and profits come from sales. But when other factors contribute more dominantly to profitability than sales, such factor as expenses, costs, assets, and non-operating revenues or loss, then relationship between sales and profitability becomes too weak to be recognized.

5. CONCLUSIONS AND RECOMMENDATIONS

The average ROA of manufacturing companies in Indonesia is 6.8%. More than 25% of the manufacturing companies outperform the industry ROA average by scoring more than 10.8% per year. But the majority of the manufacturing companies underperform the industry ROA average. Manufacturing companies in Indonesia are of diverse sizes. Overall, the average total assets is Rp. 6,667.36 billion and the average total sales is Rp. 6,822.71 billion.

In this study, classical assumptions of multicollinearity, heterocedasticity and autocorrelation requirements are met in order to obtain a good regression model. We conducted Chow, Hausman, and LM tests to select the best model, in our case is fixed effect model. By using panel data regression, we conclude that leverage and firm size have significant effect on profitability simultaneously.

However, when we look at each variable partially, we concluded that only debt ratio and total assets influence the profitability of manufacturing companies in Indonesia. The other variable, which is total sales, has insignificant effect on profitability. A negative relation between total assets and profitability of firms is logically accepted because ROA's denumerator is total assets, thus the more total assets held by a company, the lower ROA it scores assuming constant net income. However, the finding of this study is actually

contradictary with other researches. Hence, this study contributes to the literature of relationship between firm size and profitability by proving its negative relationship.

Further this study reveals that debt ratio has positive relationship with firm's profitability. Even though Indonesian manufacturing firms have high debt ratio averaging 54.9%, they are still able to manage their debts efficiently to produce profits. Last, this research finds that total sales have no significant effect on profitability. This finding is validated by assuming that other factors contribute more dominantly to profitability than sales, such factor as expenses, costs, assets, and non-operating revenues or loss, thus relationship between sales and profitability becomes too weak to be recognized.

Further research is expected to add more independent variables and period of observation in examining the effect of profitability. Comparation study with other countries in the same period with the same research methodology would be beneficial for international investors.

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