

The Effect of Debt on Firm Performance During Covid-19 Pandemic Crisis Period

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ABSTRACT

This research was conducted to examine the effect of using debt on firm performance within non-financial companies listed on the Indonesia Stock Exchange during the Covid-19 pandemic crisis period. This study uses a quantitative approach through multiple linear regression analysis. The dependent variable for firm performance is measured by Tobin's Q and ROA. The independent variables used for this study are short term debt and long term debt. Whilst the control variables are sales growth, firm size, tangibility, paid dividends, and cash flow. This study examines 1,230 secondary observation data from 410 companies over a period of 3 years. The regression will be divided into 2 periods, the normal period and the lagged period. This study shows that debt has a significant positive impact on Tobin's Q. Nevertheless, debt has an insignificant negative effect on short term debt and significant negative for long-term debt on ROA. The results difference can be explained by testing the lagged period which proves that Tobin's Q is more robust than ROA. Thus, it can be recapitulated that debt has a positive impact on Tobin's Q in the short term period and a positive impact on ROA in the long term period..

Keywords: capital structure, crisis, debt, firm performance, Indonesia Stock Exchange.

1. INTRODUCTION

The financial structure chosen by a firm aims to maximize the welfare of the shareholders. Financial structure management which consists of short-term financial management (working capital management) and capital structure management needs to be done properly because it has the potential to affect firm performance. The ideal combination of debt and equity for a firm is a combination that maximizes firm's value and minimizes the overall cost of capital (Sheikh & Qureshi, 2017). This research will emphasize the impact of using debt on firm performance during a crisis due to the global Covid-19 pandemic. Several previous researchers such as Tan (2015); Zeitun & Saleh (2015) found that debt has a negative impact on firm performance.

There are several previous researchers who have examined similar topics. Angkasajaya & Mahadwartha (2020) and Mardones & Cuneo (2020) found that short term debt had a significant negative effect on Tobin's Q, but a significant positive effect was found by Mathur et al. (2021). Furthermore, Mardones & Cuneo (2020); Mathur et al. (2021); Tan (2015) proved that long term debt has a significant negative effect on TBQ, but has a significant positive effect on TBQ according to Angkasajaya & Mahadwartha (2020). Another research was also carried out by Angkasajaya & Mahadwartha (2020); Khan et al. (2021); Mathur et al. (2021); Nguyen & Nguyen (2020) who found that short term debt had a significant negative effect on ROA, but was significantly positive according to Mardones & Cuneo (2020). Another researchs prove that the long term debt variable has a significant negative effect on ROA according to Mardones & Cuneo (2020); Mathur et al. (2021); Nguyen & Nguyen (2020); Tan (2015) but significantly positive for ROA according to Mardones & Cuneo (2020). Whereas Angkasajaya & Mahadwartha (2020) and Khan et al. (2021) found no significant negative effect on ROA. Das et al. (2021) found no significant positive effect on ROA.

The differences in the effect of using short-term debt and long-term debt on firm performance as measured by Tobin's Q and ROA from various previous studies will be examined further through a lag test. The lag test will examine the impact of lagged values on firm performance (Ahmad et al., 2012). This study aims to determine the effect of short term debt and long term debt on firm performance in non-financial companies listed on the Indonesia Stock Exchange (IDX) during the period 2019 to 2021. This research is also aimed at developing previous studies.

This research was conducted based on the theory of working capital management, especially current liabilities management which can make companies reduce funding costs and increase the funds available for expansion by minimizing the amount of funds related to working capital. This research was also conducted based on the Modigliani-Miller 1958 theory which states that capital structure is irrelevant to firm value (Hoffmann, 2014). MM theory is based on perfect capital market conditions; which cannot be found in the real world. Therefore, several other theories emerged, such as agency cost, pecking order theory, and trade-off theory which already assumed an imperfect capital market.

Based on various previous studies and several theories that have been mentioned, the hypothesis used in this study predicts that short-term debt and long-term debt each have a positive influence on firm performance as measured by Tobin's Q (TBQ) and Return on Assets (ROA).

2. RESEARCH METHODOLOGY

This research is a quantitative research because it uses various quantitative data from certain populations that are tested statistically and can be measured. This research can be classified as basic research because it aims to contribute to basic theoretical knowledge, so it only tests, modifies, then develops theories and research that has been done before and is included in causal research because it discusses the cause and effect relationship between the independent variables and the dependent variable. The independent variables used are short term debt (short term debt divided by total assets) and long term debt (long term debt divided by total assets). While the dependent variable used is firm performance as measured by Tobin's Q (TBQ, the sum of total debt with market capitalization divided by total assets) and ROA (ratio of net income to total assets). There are control variables that are tested, namely sales growth (SG, percentage change in sales to sales of the previous period), firm size (SIZE, natural logarithm of total assets), tangibility (TANG, ratio of fixed assets to total assets), paid dividend (DIV, the ratio of share's dividend to share's market price), and cash flow (CASH, the sum of earnings after tax with annual depreciation divided by total assets).

The population used in this study were non-financial companies listed on the Indonesia Stock Exchange (IDX) during the Covid-19 pandemic crisis period which met several requirements such as being listed without ever delisting or relisting on the IDX throughout 2019-2021; publish company financial reports that are audited every year during 2019-2021; and have complete data for testing in research.

The research begins by looking for research gaps from various previous studies and then identifying problems to create hypotheses in accordance with related theoretical studies. Data collection is carried out by determining the required data for all the variables tested, then downloading financial reports and collecting other secondary data, then selecting, processing secondary data, and tabulating data. The results obtained will be analyzed and compared with the hypotheses that have been made before testing.

The data processing method starts with descriptive analysis followed by multiple linear regression analysis. There are 4 regression equations that will be used in this study, namely as follows.

$$\text{Equation 1a: } TBQ_{it} = \alpha + \beta_1 STD_{it} + \beta_2 LTD_{it} + \beta_3 SG_{it} + \beta_4 SIZE_{it} + \beta_5 TANG_{it} + \beta_6 DIV_{it} + \beta_7 CASH_{it} + CRISIS + e_{it} \dots \dots \dots (1)$$

$$\text{Equation 1b: } TBQ_{it(t-1)} = \alpha + \beta_1 STD_{it} + \beta_2 STD_{it(t-1)} + \beta_3 LTD_{it} + \beta_4 LTD_{it(t-1)} + \beta_5 SG_{it} + \beta_6 SIZE_{it} + \beta_7 TANG_{it} + \beta_8 DIV_{it} + \beta_9 CASH_{it} + CRISIS + e_{it} \dots \dots \dots (2)$$

$$\text{Equation 1c: } ROA_{it} = \alpha + \beta_1 STD_{it} + \beta_2 LTD_{it} + \beta_3 SG_{it} + \beta_4 SIZE_{it} + \beta_5 TANG_{it} + \beta_6 DIV_{it} + \beta_7 CASH_{it} + CRISIS + e_{it} \dots \dots \dots (3)$$

$$\text{Equation 1d: } ROA_{it(t-1)} = \alpha + \beta_1 STD_{it} + \beta_2 STD_{it(t-1)} + \beta_3 LTD_{it} + \beta_4 LTD_{it(t-1)} + \beta_5 SG_{it} + \beta_6 SIZE_{it} + \beta_7 TANG_{it} + \beta_8 DIV_{it} + \beta_9 CASH_{it} + CRISIS + e_{it} \dots \dots \dots (4)$$

Where: α is constant coefficient, $CRISIS$ is dummy crisis, β is regression coefficient, and e error.

This study will divide the examination into 2 time periods, namely the normal period and the lagged 1 period. Equation 1a is a regression equation with the dependent variable TBQ, while equation 1b is a regression equation with the TBQ dependent variable experiencing a lagged value. Equation 1c is a regression equation with the dependent variable ROA, while equation 1d is a regression equation with the dependent variable ROA having a lagged value.

Next is the panel data model determination test to determine the appropriate method for testing for this research through the Chow test (to choose between Common Effects Model or Fixed Effects Model) and the Hausman test (to choose between Fixed Effects Model or Random Effects Model). Then the research is continued by conducting a classic assumption test which aims to determine the feasibility of data that must meet the BLUE principle. The classical assumption test will be carried out successively starting from the normality test, multicollinearity test, autocorrelation

test, and heteroscedasticity test. The last step is testing the hypothesis with the F test, t test, and test the coefficient of determination.

3. RESULTS AND DISCUSSION

Ticker that met the requirements for this study were 410 out of 650 tickers of non-financial money companies registered on the IDX from 2019 to 2021. Thus, a total of 1,230 observations were obtained. Appendix 1 presents the results of the research descriptive statistics showing the mean, median, max, and min values of all research variables. Next is the normality test as seen from the results of the Jarque-Bera probability for the TBQ variable of 0,000000 and the ROA variable of 0,004388. These numbers indicate that the data is not normally distributed. However, this study uses a sample size greater than 30, so the data is assumed to be normally distributed with the assumption of the Central Limit Theorem described by Gujarati & Porter (2009).

Next is the multicollinearity test which aims to determine the relationship between the independent variables and the control variables. Appendix 2 describes the correlation between variables that is less than 0.8. Therefore, it can be concluded that the variables studied are free from multicollinearity. This study uses panel data that tests several companies over a certain period. According to Gujarati & Porter (2009), autocorrelation generally occurs in time-series data because the data used is only one company for several periods

Appendix 2 proves that the independent variable STD has a coefficient value of 1.005733 and a probability value of 0.0000 for the TBQ dependent variable. These results prove that the independent variable short term debt has a significant positive effect on firm performance as measured by Tobin's Q on non-financial companies listed on the IDX during the Covid-19 pandemic crisis period. So, hypothesis 1 (H1) of the study is accepted because it is in accordance with the test results. This conclusion is in accordance with various studies that have been conducted by Mathur et al. (2021) which states that financing with debt provides certain signals for investors, such as companies with positive cash flows to pay debt bonds. He stated that funding through debt can strengthen the book value to market value which also supports the research results. The positive effect between short-term debt and Tobin's Q indicates that financing through debt can provide a signal for information. The intended signal is that the company has positive cash flow to pay debt obligations.

Appendix 2 also describes the coefficient value of the independent variable LTD on the dependent variable TBQ of 0.980553 and a probability value of 0.0000. Thus it can be concluded that the independent variable long term debt has a positive and significant effect on firm performance as measured by Tobin's Q on non-financial companies listed on the IDX during the Covid-19 pandemic crisis period. These results indicate that the test results are in line with hypothesis 2 (H2) of the study, so the hypothesis is accepted. The results of this test are supported by previous researchers, Angkasajaya & Mahadwartha (2020), which proves that an increase in the amount of long-term debt will cause the firm performance as measured by Tobin's Q also increase. Angkasajaya & Mahadwartha (2020) states that companies choose to use long-term debt if they have definite cash flows in the future.

On the other hand, Appendix 2 shows the lag test on the TBQ dependent variable. Lagged value gives the opposite effect to the normal period. Thus, the effect of short-term debt and long-term debt on the TBQ variable occurs at the same time. The TBQ dependent variable is able to provide a quick reaction or in the same period because there is the influence of external factors in the form of an investor's point of view that is also considered (Angkasajaya & Mahadwartha, 2020).

The coefficient and probability values of the independent variable STD on the dependent variable ROA in Appendix 2 are -0.000535 and 0.2316 respectively. These two numbers mean that the independent variable short term debt has a negative and insignificant effect on the dependent variable firm performance as measured by ROA in non-financial companies listed on the IDX during the Covid-19 pandemic crisis period. Thus, hypothesis 3 (H3) at the beginning of the study was rejected because the test results stated that the short term debt variable had no effect on the ROA variable. Several previous researchers, such as Angkasajaya & Mahadwartha (2020); Khan et al. (2021); Mathur et al. (2021); Nguyen & Nguyen (2020), has also proven negative but significant results. According to Angkasajaya & Mahadwartha (2020), the lower the level of short-term debt used by the company, the cost of debt will decrease, thereby increasing the company's profitability which of course has a positive impact on the company. Angkasajaya & Mahadwartha (2020) also argued that the company's costs incurred by paying short-term debt are greater than using internal funding through retained earnings. Mathur et al., (2021) argues that interest payments from the issuance of debt can reduce the company's cash flow and available funds for investment, so this has a negative impact on the company's performance.

In Appendix 2 it is also proven that the independent variable LTD has a coefficient value of -0.000655 and a probability value of 0.0154 for the dependent variable ROA. These values prove that the independent variable long term debt has a significant negative effect on the dependent variable firm performance as measured by ROA in non-financial companies listed on the IDX during the Covid-19 pandemic crisis period. This finding is not in line with hypothesis 4 (H4) which states a significant positive relationship. Then hypothesis 4 is rejected. The results of this study are in accordance with the pecking order theory and are consistent with previous researchers such as Mathur et al. (2021); Nguyen & Nguyen (2020); Tan (2015). The pecking order theory states that high debt financing could decrease firm's value because debt is an obligation that must be repaid so that a company's financial risk will increase resulting in a company's liquidity and operational risks. According to Mathur et al. (2021), high debt interest can reduce firm performance because interest payments from debt issuance can reduce the company's cash flow. Referring to the results of research conducted by Tan (2015), firm performance decreased during the crisis so that the performance of companies with low debt is superior to companies with high debt.

Appendix 2 presents the regression results for the lagged period using ROA as the dependent variable. With the lagged on the book value, the variables of short-term debt and long-term debt actually have a significant positive effect on the ROA variable. Changes in results due to this lag can be explained by the research conducted Beaver & Ryan (2000). Beaver & Ryan (2000) states that lag makes unexpected economic gains (losses) to be recognized in the book value in the long term rather than in the short term, so that the book value temporarily has a lower value than the market value. In addition, the ROA variable has a slow reaction, so that the influence of the independent variables will be seen in the long term.

Appendix 2 show a probability value of 0.000000 which is smaller than 0.05. So it can be interpreted that found a significant influence between all independent variables short term debt and long term debt on the dependent variable TBQ and ROA. The coefficient of determination in Appendix 2 shows that this study is able to explain the dependent variable firm performance as measured by TBQ of 99.97% - 99.98%. The remaining 0.12% - 0.13% is influenced by factors outside the research. These two measurements gave similar results, so consistent results were found, namely the influence of the independent variables on the dependent variable of the study. Furthermore, the coefficient of determination in Appendix 2 shows that the independent variables (STD and LTD) can explain the dependent variable ROA of 99.99%. The residual value of 0.01% is explained by several other variables not tested in this study.

4. CONCLUSION

This research is intended to prove the impact of using debt on firm performance during a crisis due to the global Covid-19 pandemic. By using data from 1,230 non-financial companies listed on the IDX during 2019-2021 which were processed using multiple linear regression, there are 2 hypotheses that are accepted and 2 hypotheses rejected. Short term debt and long term debt were found to have a significant positive effect on firm performance as measured by Tobin's Q in the normal period but significantly negative in the lagged period. Short term debt was found to have an insignificant negative effect on firm performance as measured by ROA in the normal period but significantly positive in the lagged period. Long term debt was found to have a significant negative effect on firm performance as measured by ROA in the normal period but significantly positive in the lagged period. The difference in results in the normal period and the lagged period proves that the Tobin's Q variable is a more robust variable than the ROA variable because it is able to react more quickly. The Tobin's Q variable is closely related to market capital where the information can be accessed directly by all investors. While the ROA variable uses book value, so there is a 1 year lag that occurs due to the issuance of the company's financial statements in the following year.

This research certainly has various limitations, such as the research period which is only limited during 2019-2021 so that it cannot see the impact of debt on firm performance in the longer term. Even though it has weaknesses, this research has been able to become a reference for companies and other researchers to make a decision because this research has used a fairly large amount of data. Future researchers are expected to be able to maximize this research as reference material for future research development. Some examples of development that can be done are expanding the research object, extending the research period, using other firm performance measurement tools such as ROE and EPS, using independent variables from the market based side such as yield to maturity, as well as using other variables that have not been used in this study.

REFERENCES

- Ahmad, Z., Abdullah, N. M. H., & Roslan, S. (2012). *Capital Structure Effect on Firms Performance: Focusing on Consumers and Industrials Sectors on Malaysian Firms*.
- Angkasajaya, G. M., & Mahadwartha, P. A. (2020). The Impact of Capital Structure Towards Firm Performance Moderated by Corporate Governance in LQ-45 Company in BEI at 2013-2018. *International Conference on*

Business and Banking Innovations (ICOBBI), 1–9.

- Beaver, W. H., & Ryan, S. G. (2000). Biases and Lags in Book Value and Their Effects on the Ability of the Book-to-Market Ratio to Predict Book Return on Equity. *Journal of Accounting Research*, 38(1), 127. <https://doi.org/10.2307/2672925>
- Das, N. C., Chowdhury, M. A. F., & Islam, M. N. (2021). The Heterogeneous Impact of Leverage on Firm Performance: Empirical Evidence from Bangladesh. *South Asian Journal of Business Studies*, 1–18. <https://doi.org/10.1108/SAJBS-04-2020-0100>
- Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics*. McGraw-Hill Irwin. <https://books.google.co.id/books?id=6l1CPgAACAAJ>
- Hoffmann, P. S. (2014). Internal Corporate Governance Mechanisms as Drivers of Firm Value: Panel Data Evidence for Chilean Firms. *Review of Managerial Science*, 8(4), 575–604. <https://doi.org/10.1007/s11846-013-0115-3>
- Khan, N., Ullah, H., & Afeef, M. (2021). The Effect of Leverage and Debt Maturity on the Corporate Financial Performance: Evidence from Non Financial Firms Listed at Pakistan Stock Exchange. *Sustainable Business and Society in Emerging Economies*, 3(1), 35–47. <https://doi.org/10.26710/sbsee.v3i1.1829>
- Mardones, J. G., & Cuneo, G. R. (2020). Capital Structure and Performance in Latin American Companies. *Economic Research-Ekonomska Istraživanja*, 33(1), 2171–2188. <https://doi.org/10.1080/1331677X.2019.1697720>
- Mathur, N., Tiwari, S. C., Sita Ramaiah, T., & Mathur, H. (2021). Capital Structure, Competitive Intensity and Firm Performance: An Analysis of Indian Pharmaceutical Companies. *Managerial Finance*, 47(9), 1357–1382. <https://doi.org/10.1108/MF-01-2020-0009>
- Nguyen, T. H., & Nguyen, H. A. (2020). Capital Structure and Firm Performance of Non-Financial Listed Companies: Cross-Sector Empirical Evidences from Vietnam. *Accounting*, 137–150. <https://doi.org/10.5267/j.ac.2019.11.002>
- Sheikh, N. A., & Qureshi, M. A. (2017). Determinants of Capital Structure of Islamic and Conventional Commercial Banks. *International Journal of Islamic and Middle Eastern Finance and Management*, 10(1), 24–41. <https://doi.org/10.1108/IMEFM-10-2015-0119>
- Tan, T. K. (2015). *Financial distress and firm performance : Evidence from the Asian financial crisis*.
- Zeitun, R., & Saleh, A. S. (2015). Dynamic performance, financial leverage and financial crisis: evidence from GCC countries. *EuroMed Journal of Business*, 10(2), 147–162. <https://doi.org/10.1108/EMJB-08-2014-0022>

Appendix 1. Descriptive Statistics

	<i>TBQ</i>	<i>ROA</i>	<i>STD</i>	<i>LTD</i>	<i>SG</i>	<i>SIZE</i>	<i>TANG</i>	<i>DIV</i>	<i>CASH</i>	<i>CRISIS</i>
<i>Mean</i>	0,767	0,014	0,304	0,201	0,061	14,830	0,355	0,012	0,025	0,666
<i>Median</i>	0,536	0,015	0,239	0,143	0,016	14,766	0,324	0,000	0,021	1,000
<i>Maximum</i>	18,107	2,071	2,908	2,118	8,370	19,004	0,988	0,479	2,071	1,000
<i>Minimum</i>	0,002	-1,049	0,000	0,000	-0,997	8,918	0,000	0,000	-1,049	0,000
<i>Observations</i>	1.230	1.230	1.230	1.230	1.230	1.230	1.230	1.230	1.230	1.230

Appendix 2. Statistics Results

Period	Normal Period TBQ			Normal Period ROA			Lagged Period TBQ			Lagged Period ROA		
<i>Variable</i>	<i>B</i>	<i>t-Stat</i>	<i>Prob.</i>	<i>B</i>	<i>t-Stat</i>	<i>Prob.</i>	<i>B</i>	<i>t-Stat</i>	<i>Prob.</i>	<i>B</i>	<i>t-Stat</i>	<i>Prob.</i>
<i>C</i>	0,011519	1,859	0,0000***	0,002463	-0,816	0,4146	0,353277	-2,890	0,0039***	0,009225	6,771	0,0000***
<i>STD</i>	0,001037	9,694,130	0,0000***	0,000447	-1,197	0,2316	0,321081	7,163	0,0000***	0,008384	-4,279	0,0000***
<i>STD(-1)</i>							0,343878	-3,069	0,0022***	0,008979	2,901	0,0038***
<i>LTD</i>	0,002784	3,522,603	0,0000***	0,000506	-2,427	0,0154**	0,333868	5,285,598	0,0000***	0,008718	-3,898	0,0001***
<i>LTD(-1)</i>							0,334053	-3,819	0,0001***	0,008723	4,961	0,0000***
<i>SG</i>	0,000106	7,514,999	0,0000***	9,17E-05	-3,711	0,0002***	0,068005	-1,671,302	0,0950*	0,001776	1,082	0,2795
<i>SIZE</i>	0,000731	3,232,317	0,0013***	0,000156	-3,126	0,0018***	0,023212	3,035,078	0,0025***	0,000606	-7,028	0,0000***
<i>TANG</i>	0,005247	8,723,364	0,0000***	0,000422	-6,090	0,0000***	0,153850	3,576,622	0,0004***	0,004017	-4,760	0,0000***
<i>DIV</i>	0,041097	-4,865	0,0000***	0,000393	-6,189	0,0000***	1,193,849	0,106810	0,9150	0,031174	-2,952	0,0032***
<i>CASH</i>	0,003740	5,740,314	0,0000***	0,000239	4,160	0,0000***	0,355831	7,194,239	0,0000	0,009292	9,845	0,0000***
<i>CRISIS</i>	0,000128	-6,761	0,0000***	6,06E-05	-1,080	0,0000***						
<i>R-squared</i>		0,999800			0,999903			0,179677			0,961736	
<i>Adjusted R-squared</i>		0,999697			0,999853			0,170563			0,961311	