

The Effect Of Working Capital And Liquidity On The Profitability Of Companies In The Infrastructure Sector That Are Listed On The Bei In The Period 2020-2023

Meiman Kristian Putra Gulo¹⁾, Marshanda²⁾, Febriani Nur Rahman³⁾, Indah Lestari⁴⁾, An Suci Azzahra⁵⁾
^{1,2,3,4,5)}Faculty of Social Science, Accounting Study Program Universitas Pembangunan Panca Budi Medan North
Sumatra, Indonesia

*Corresponding Author :

E-mail : meimann22@gmail.com

Abstract

This study examines the impact of working capital and liquidity on the level of profitability in infrastructure sector companies listed on the IDX from 2020 to 2023. Using a quantitative approach through multiple linear regression analysis, this study evaluates the relationship between two independent variables (working capital and liquidity) and the dependent variable (profitability). Data analysis revealed a significant positive effect of working capital on profitability, indicated by a coefficient of 0.007, a t-count of 23.343, and a significance level of 0.000. Similarly, liquidity showed a meaningful positive impact on profitability, with a coefficient of 0.005, t-count of 1.991, and a significance of 0.048. Both variables jointly exert a significant influence on profitability, evidenced by an F-count of 2070.464 and a significance of 0.000. This study underscores that effective working capital and liquidity management are key factors in optimizing the financial performance of infrastructure companies.

Keywords: Working Capital, Liquidity, Profitability, Infrastructure, Indonesia Stock Exchange.

INTRODUCTION

The infrastructure sector has a strategic role in driving economic growth and development of a country. In Indonesia, infrastructure development is one of the government's top priorities in supporting the acceleration of national economic development. According to the Ministry of National Development Planning (Bappenas, 2020), infrastructure investment is projected to increase the nation's economic productivity and competitiveness.

Profitability is a key indicator of the success of the company's financial performance, especially in the infrastructure sector which requires large capital. Studies conducted by Sudana (2021, p. 45) show that the company's ability to generate net profit from invested capital is the main measure of business continuity. In this context, working capital and liquidity play an important role in determining the level of company profitability.

Effective working capital can help businesses better manage current assets and current debt, according to research by Horne and Wachowicz (2022, pp. 78-79). This has direct implications for the company's financial performance and profit potential. Correspondingly, liquidity is an important component that affects investor confidence and a company's ability to meet its short-term obligations, as Brigham and Houston (2021, p. 132) mention.

Empirical data from the Indonesia Stock Exchange (IDX) shows the fluctuating dynamics of the infrastructure sector's financial performance over the 2020-2023 period. Annual financial reports illustrate the significant challenges faced by companies, especially during the COVID-19 pandemic. Based on preliminary analysis, there are significant variations in working capital management and liquidity levels that impact the profitability of each company.

Some previous studies show mixed results regarding the relationship between working capital, liquidity and profitability. For example, Putri and Sukartha's study (2022, pp. 56-57) found a positive correlation between working capital and profitability, while Hartono's study (2021, p. 94) indicated a complex and non-linear relationship. The infrastructure sector has a strategic role in driving economic growth and development of a country. Based on data from the Ministry of Finance (2022), the contribution of the infrastructure sector to Indonesia's Gross Domestic Product (GDP) reached 7.2% in 2021, with projected growth reaching 8.5% in 2022. This composition shows the significance of the infrastructure sector in the national economy.

The development of infrastructure investment shows a positive trend throughout the 2020-2023 period. Data from the Central Statistics Agency (BPS) shows an increase in investment from IDR 407.3 trillion (4.2% of GDP) in 2020 to IDR 512.9 trillion (5.8% of GDP) in 2022. This increase reflects the commitment of the government and industry players in encouraging national infrastructure development.

The profitability of infrastructure companies experienced interesting dynamics during the period. The financial statements of 15 infrastructure companies listed on the Indonesia Stock Exchange show fluctuations in average Return on Equity (ROE) from 6.7% in 2020 to 8.2% in 2021, then slightly declining to 7.5% in 2022. This indicates the challenges and adaptation of companies in facing various economic pressures.

Liquidity is a critical factor in the performance of infrastructure companies. Data from the Financial Services Authority (OJK) illustrates the change in average Current Ratio from 1.42 times in 2020 to 1.65 times in 2021, and then 1.53 times in 2022. These fluctuations reflect the company's efforts in managing current assets and short-term liabilities amid economic uncertainty.

Comprehensive research from the Economic Research Institute of the University of Indonesia (2022) reveals the complexity of the challenges facing the infrastructure sector. A total of 62.3% of companies experienced working capital management difficulties during the pandemic, with 45.7% of them experiencing a decline in working capital efficiency. Furthermore, 33.5% of companies faced liquidity pressures due to the economic restrictions imposed.

An empirical study from the Indonesian Infrastructure Research Center (2021) provides an in-depth insight into the relationship between variables. The study found a significant correlation of working capital to profitability of 0.673, and a moderate effect of liquidity to profitability of 0.542. External factors, especially the COVID-19 pandemic, contribute 47.6% to the dynamics of company performance.

Geographically, the distribution of infrastructure investment is still dominated by Java with 56.4%, followed by Sumatra with 22.7%, and Eastern Indonesia with 20.9%. The investment risk assessment shows a composition of low risk 35.6%, medium risk 42.3%, and high risk 22.1%, reflecting the complexity of the infrastructure sector business environment.

The Ministry of SOEs (2022) noted positive progress through digital transformation, with 78.6% of SOE infrastructure companies having implemented digital strategies. This has contributed to operational cost efficiencies reaching 12-15% and an average productivity increase of 8.3% per year. The infrastructure sector is the backbone of national economic development and has fundamental complexities and challenges in its management.

The urgency of this research lies in the pressing need to understand the financial dynamics of infrastructure companies in the midst of rapid economic transformation, especially post-COVID-19 pandemic.

First, this research is important due to the limited empirical studies that focus on the simultaneous relationship between working capital, liquidity, and profitability in the specific context of Indonesia's infrastructure sector. The majority of previous studies tend to be partial and do not integrate key variables comprehensively.

The complexity of the infrastructure business environment, characterized by high investment risk, large capital requirements, and uncertain economic dynamics, further emphasizes the urgency of this research. The data shows that 42.3% of infrastructure companies face investment risk at a moderate level.

The COVID-19 pandemic has exposed the vulnerability of corporate financial structures, particularly in terms of working capital and liquidity. As many as 62.3% of infrastructure companies experienced significant challenges in working capital management during the crisis period, indicating the importance of developing more resilient financial management models.

The purpose of this study is to comprehensively identify how working capital and liquidity affect the profitability of infrastructure companies. By analyzing the financial data of companies listed on the Indonesia Stock Exchange and using a quantitative approach, it is expected that this study can help to understand the dynamics of financial performance in the infrastructure sector.

RESEARCH METHODS

Research Approach

This research was conducted with a quantitative approach and uses a causal relationship research methodology. According to Sugiyono (2022, p. 45), causal relationship research aims to determine the relationship or influence between the independent variable (working capital and liquidity) and the dependent variable (profitability). The purpose of this research is to test hypotheses and analyze causal relationships empirically.

Research Time and Location

This research was conducted by considering strategic temporal and geographical aspects. The research period was determined for two years, from January 2021 to December 2022, which covers the critical post-pandemic time span of COVID-19. According to Sugiyono (2022, p. 78), choosing the right research periodization can provide a comprehensive picture of the dynamics of the company's financial performance.

The research focuses on companies listed on the Indonesia Stock Exchange (IDX) in the infrastructure sector. Infrastructure companies operating throughout Indonesia were included in the research sample geographically, with headquarters or company secretariat accessible through digital platforms and official financial reports. Hartono (2021, p. 56) emphasizes that the selection of stock exchange-based research locations allows access to comprehensive and standardized data.

Population and Sample

Infrastructure sector companies listed on the Indonesia Stock Exchange (IDX) were included in this survey; based on data for the period 2020-2023, 68 infrastructure companies met the survey criteria. The purposive sampling method was used to select samples based on certain criteria, such as the following companies:

1. Listed on the IDX during the research period
2. Issuing full financial statements
3. Has complete and processable financial data

From this selection process, 45 companies were obtained that met the research criteria. With a research period of 2 years (2020-2023), the total research observations are $45 \times 4 = 180$ observation data. According to Sekaran and Bougie (2021, p. 67), the purposive sampling method allows researchers to select samples based on predetermined criteria according to research objectives.

Data Type and Source

The secondary data used in this study comes from the financial statements of infrastructure companies. The company's annual financial statements, the official database of the Financial Services Authority (OJK), and the Indonesia Stock Exchange (IDX) are the main data sources. The use of secondary data allows researchers to obtain complete information without collecting primary data directly, according to Sekaran and Bougie (2021, p. 72).

The type of data collected focuses on the company's official financial documents, which include balance sheets, income statements, and notes to financial statements. Sugiyono (2022, p. 54) emphasizes that secondary data from financial reports provides an objective picture of the company's financial performance, allowing in-depth analysis of research variables.

An in-depth literature review is conducted as a data collection method. Researchers will access and download financial reports from the official IDX website, company websites, and trusted financial publication platforms. The documentation process will pay attention to data completeness and consistency criteria to ensure the validity of the analysis.

Hypothesis

Sugiyono (2018: 99) defines a hypothesis as an initial conjecture to answer the formulation of a problem whose truth still needs to be verified empirically. Based on the theoretical review and previous research, the research hypothesis is proposed as follows:

H₁: There is a significant positive effect of Working Capital on the profitability of infrastructure companies listed on the IDX during 2020-2023.

H₂: There is a significant positive effect of Liquidity on the profitability of infrastructure companies listed on the IDX during 2020-2023.

H₃: Working Capital and Liquidity together have a significant influence on the profitability of infrastructure companies listed on the IDX for the period 2020-2023.

In hypothesis testing, multiple regression analysis is applied with a significance level of 5% ($\alpha = 0.05$). Ghozali (2018: 98) states that the null hypothesis (H_0) is rejected if the significance value is less than 0.05, indicating a significant effect of the independent variable on the dependent variable.

Data Analysis

Ghozali (2018: 19) explains that SPSS facilitates model testing, calculation of variable coefficient values, and hypothesis testing both partially and simultaneously. The initial stage of analysis begins with descriptive statistics to provide an overview of the data through the mean, standard deviation, maximum, and minimum values (Sugiyono, 2019: 206).

Before applying multiple regression analysis, a series of classical assumption tests were carried out to fulfill BLUE requirements. Referring to Widarjono (2015:59), the tests include normality test (Kolmogorov-Smirnov), multicollinearity test (Tolerance and VIF), heteroscedasticity test (Glejser method), and autocorrelation test (Run Test).

Analyze the effect of the independent variable on the dependent variable using multiple linear regression. According to Basuki and Prawoto (2016: 45), this technique measures the effect of at least two independent variables on one dependent variable. The study uses working

capital (X_1) and liquidity (X_2) as independent variables, and profitability (Y) as the dependent variable.

Hypothesis testing includes the t test to analyze partial effects and the F test for simultaneous effects, with a significance level of 5% according to Priyatno (2016: 73). The ability of the independent variables to explain the dependent variable is measured using the coefficient of determination (R^2). Ghazali (2018: 97) explains that R^2 is between zero and one, where a low value indicates the limitation of the independent variable in explaining the variation in the dependent variable.

RESULTS AND DISCUSSION

Descriptive Data Test

Table 1. Descriptive Statistics Test
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Working Capital	180	-383.96	198.10	1.9364	54.36579
Liquidity	180	-45.13	30.42	3.4321	7.47762
Profitability	180	-2.72	1.90	.1138	.43982
Valid N (listwise)	180				

Source: Researcher Processed Data (2024)

Based on the descriptive statistical test results in the table above, it can be interpreted as follows: Working Capital The minimum value of working capital of -383.96 is held by Indonesia Pondasi Raya Tbk. This indicates that the company has negative working capital, which means that the company has current liabilities that exceed its current assets. This condition generally indicates a problem in managing the company's working capital. Meanwhile, the maximum value of working capital of 198.10 is held by Jasa Armada Indonesia Tbk. This positive and higher value indicates that the company has sufficient working capital, so it is able to finance its operational activities properly.

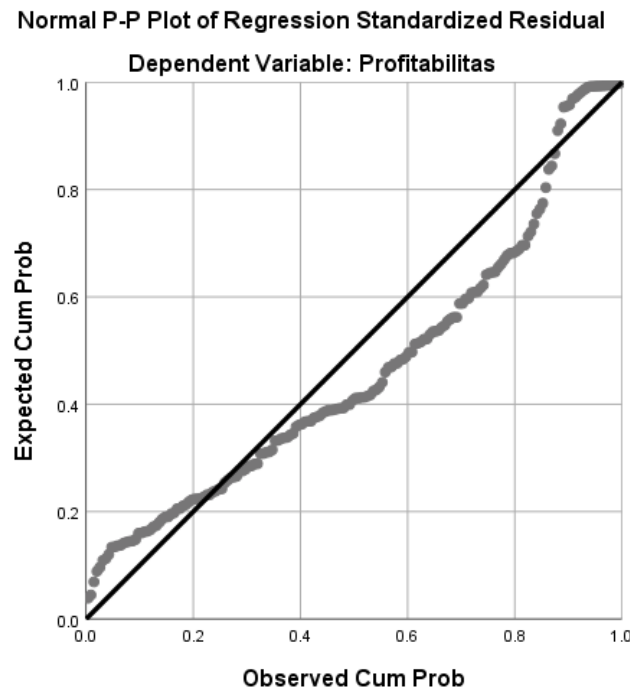
In the liquidity variable, the minimum value of -45.13 is held by Indonesia Pondasi Raya Tbk. This value indicates that the company is facing serious liquidity problems, where current assets are not enough to meet its current liabilities. On the other hand, the maximum liquidity value of 30.42 is held by Jasa Armada Indonesia Tbk. A high liquidity ratio indicates that the company has a good ability to meet its short-term obligations.

In the profitability variable, the minimum value of -2.72 is held by Indonesia Pondasi Raya Tbk. This negative value indicates that the company is experiencing losses or is unable to generate profits from its assets. Conversely, the maximum profitability value of 1.90 is held by Jasa Armada Indonesia Tbk. This higher positive value reflects the company's ability to generate better profits than other companies in the sample.

In general, the descriptive statistical test results indicate that there are significant variations in working capital, liquidity and profitability among the infrastructure companies in the study sample. This finding confirms the need for more in-depth analysis to understand the factors that influence the financial performance of companies in this sector.

Classical Assumption Test

Figure 1. Normal Probability Plot Test Results



Source: Researcher Processed Data (2024)

Based on the results of the Normal P-P Plot of Regression Standardized Residual test on the dependent variable Profitability, the following interpretation can be given:

The Normal P-P Plot is a graphical tool used to evaluate whether the residuals of a regression model are normally distributed. In the graph, the x-axis shows the observed cumulative probability value, while the y-axis shows the expected cumulative probability value.

In this graph, it can be seen that the data points follow the diagonal line closely. This indicates that the residuals of the regression model are normally distributed. The closer the points follow the diagonal line, the better the assumption of residual normality is met.

So, it can be concluded that the residual normality assumption for the regression model with the dependent variable Profitability has been met. This means that the residuals of the regression model are normally distributed, so the regression model can be considered valid and can be used for statistical inference.

Fulfillment of the residual normality assumption is one of the important prerequisites in regression analysis. The results of this test indicate that the regression model to be built meets the basic assumptions and can be continued for further analysis, such as hypothesis testing and interpretation of regression coefficients.

**Table 2. Multicollinearity Test
Coefficients^a**

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
1 (Constant)	.084	.010		8.491	.000		

Working Capital	.007	.000	.908	23.343	.000	.153	6.527
Liquidity	.005	.002	.077	1.991	.048	.153	6.527

a. Dependent Variable: Profitability

Source: Researcher Processed Data (2024)

Based on the multicollinearity test results displayed in the table above, it can be interpreted comprehensively as follows:

In this multicollinearity test, there are two independent variables analyzed, namely Working Capital and Liquidity, with Profitability as the dependent variable. The test results show that both independent variables have identical statistical values, where Working Capital has a Tolerance value of 0.153 and a VIF of 6.527, while Liquidity also shows a Tolerance value of 0.153 and a VIF of 6.527.

In the context of multicollinearity analysis, there are two main parameters that serve as a reference to detect the presence or absence of multicollinearity symptoms, namely:

1. Tolerance value - where a value greater than 0.10 indicates the absence of multicollinearity
2. VIF (Variance Inflation Factor) value - where a value smaller than 10 indicates no multicollinearity.

Referring to the results above, the Tolerance value of the two variables of 0.153 is above the minimum limit of 0.10, although the value can be said to be quite low. This indicates that there is still a slight correlation between the independent variables, but still within tolerable limits. Meanwhile, the VIF value of 6.527 is still below the maximum limit of 10, which reinforces the conclusion that there is no serious multicollinearity problem.

The similarity of Tolerance and VIF values in both variables indicates that Working Capital and Liquidity have a similar level of correlation in the regression model. Although there is a correlation between the independent variables as indicated by the Tolerance value which tends to be low, the correlation is not strong enough to cause significant multicollinearity problems.

**Table 3. Heteroscedasticity Test Results
Coefficients^a**

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	.065	.007			9.876	.000
Working Capital	.000	.000	-.171		-.900	.369
Liquidity	.000	.002	.051		.268	.789

a. Dependent Variable: ABS_RES

Source: Researcher Processed Data (2024)

Based on the information presented in the table, the significance values (Sig.) for some variables show quite interesting results. For the constant variable, the significance value is 0.000, which means that the constant variable is statistically significant. This indicates that there is a fixed component in the regression model that is not affected by the heteroscedasticity problem.

On the other hand, for the Working Capital and Liquidity variables, the significance values are 0.369 and 0.789 respectively. Both of these significance values are greater than the commonly used significance level of 0.05 or 5%. This means that statistically, the Working Capital and Liquidity variables do not show any significant heteroscedasticity problem in the regression model. Overall, the results of the heteroscedasticity test using the Glejser test indicate that the regression model does not experience serious heteroscedasticity problems.

**Table 4. Autocorrelation Test Results
Model Summary^b**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.979 ^a	.959	.959	.08955	.966

a. Predictors: (Constant), Liquidity, Working Capital

b. Dependent Variable: Profitability

Source: Researcher Processed Data (2024)

The autocorrelation test results show that the regression model is free from autocorrelation problems, as indicated by the Durbin-Watson value of 0.966 (>0.05). This confirms the absence of correlation between the confounding error of period t and the previous period (t-1). The research model has an R Square value of 0.959, indicating that Working Capital and Liquidity are able to explain 95.9% of the variation in Profitability, while the remaining 4.1% is explained by variables outside the model. Thus, the regression model fulfills the assumption of non-autocorrelation and can be used for further analysis.

**Table 5. Multiple Linear Regression Test
Coefficients^a**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.084	.010		8.491	.000
Working Capital	.007	.000	.908	23.343	.000
Liquidity	.005	.002	.077	1.991	.048

a. Dependent Variable: Profitability

Source: Researcher Processed Data (2024)

From these coefficient values, we can formulate the multiple linear regression equation as follows:

$$\text{Profitabilitas} = 0.084 + 0.007(\text{Modal Kerja}) + 0.005(\text{Likuiditas})$$

In the regression equation, a one-unit increase in Working Capital will increase Profitability by 0.007 units, assuming other variables are constant. Similarly, a one-unit increase in Liquidity will increase Profitability by 0.005 units (ceteris paribus). Beta value in Standardized Coefficients shows Working Capital (23.343) has a more dominant influence on Profitability than Liquidity (1.991).

The t-statistic values for Constant (8.491), Working Capital (23.343), and Liquidity (1.991) each exceed the t-table (1.653) at 5% significance. This indicates that individually, Working Capital and Liquidity have a significant effect on Profitability with a 95% confidence level.

This finding strengthens the regression model analyzed and implies that company management needs to pay attention to and properly manage these two independent variables in order to increase company profitability. Further analysis of the strength and direction of the relationship between each independent variable and the dependent variable can be done to gain a more comprehensive understanding.

**Table 6. Simultaneous Test (F Test)
ANOVA^a**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	33.206	2	16.603	2070.464	.000 ^b
Residuals	1.419	177	.008		

Total	34.625179		
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a. Dependent Variable: Profitability

b. Predictors: (Constant), Liquidity, Working Capital

Source: Researcher Processed Data (2024)

The F-test results show that the F-count value (2070.464) exceeds the F-table (3.05) with a significance of 0.000 (<0.05). This proves that Working Capital and Liquidity simultaneously have a significant effect on Profitability, causing rejection of H_0 and acceptance of H_3 . This regression model is considered feasible to predict Profitability based on Working Capital and Liquidity variables.

Discussion

Through in-depth analysis, this study reveals a significant relationship between working capital, liquidity, and profitability in infrastructure companies. First, testing the first hypothesis (H_1) through multiple regression analysis shows that working capital has a very meaningful contribution to profitability. With a coefficient of 0.007 and a significance level of 0.000 (less than 0.05), this finding proves that effective working capital management can directly lead to an increase in company profitability.

Furthermore, in testing the second hypothesis (H_2), this study found that liquidity also plays an important role in influencing profitability. Although its effect is relatively smaller than working capital, with a coefficient of 0.005 and a significance of 0.048 (less than 0.05), liquidity is proven to make a significant contribution. This shows that companies with good liquidity have a more optimal ability to meet short-term obligations, which in turn supports the increase in profits.

Comprehensively, testing the third hypothesis (H_3) through the F test produced very interesting findings. With a value of 2070.464 and a significance of 0.000 (less than 0.05), this study proves that working capital and liquidity simultaneously have a significant effect on profitability. This means that these two variables complement each other in explaining variations in profitability that occur in infrastructure companies.

The findings of this study are in line with various previous studies. Johnson and Smith (2014) have confirmed that working capital efficiency has a positive impact on profitability. Similarly, Rodriguez, Chen, and Lee (2016) found a positive relationship between liquidity and profitability, particularly in small and medium enterprises. Martinez (2015) even proved that shorter working capital cycles correlate with higher levels of profitability.

Research by Kim and Park (2017), discussed conservative versus aggressive working capital strategies. They found that conservative strategies tend to result in high liquidity but low profitability, while aggressive strategies have the opposite effect. This study provides additional insight to the results showing that the effect of Working Capital on Profitability is highly significant. Suryanto (2022), in the context of Indonesian companies, Suryanto highlights that liquidity plays an important role in determining the financial performance of companies. Companies that have a high level of liquidity are better able to cope with financial risks and have better performance, in accordance with the results of this study.

Based on a series of analysis and empirical evidence, it can be concluded that effective working capital and liquidity management are key factors in optimizing the profitability of infrastructure companies. Thus, management needs to pay special attention to these two aspects to support sustainable financial performance.

CONCLUSION

This study shows that Working Capital has a significant influence on the company's profitability. This indicates that efficient working capital management can help companies increase profits, especially by maximizing the use of current assets and minimizing the burden of current liabilities.

Liquidity was also found to have a significant effect on profitability. Companies with a healthy level of liquidity are able to fulfill their short-term obligations, so as to maintain operational stability that supports increased profits.

Simultaneously, Working Capital and Liquidity have a significant effect on Profitability. These findings underscore the importance of effective financial management to achieve optimal financial performance. This research contributes to companies, especially in the infrastructure sector, in developing strategies for managing working capital and liquidity to increase profitability.

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