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Du Pont *System Analysis* in Measuring Financial Performance of the Infrastructure Sector

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Abstract: *This study aims to analyze the differences in financial performance of infrastructure sector companies listed on the Indonesia Stock Exchange between the pandemic period (2020-2022) and the post-pandemic period (2023-2024) using the Du Pont System approach. The variables analyzed include Net Profit Margin (NPM), Total Asset Turnover (TATO), Equity Multiplier (EM), and Return on Equity (ROE). This study uses secondary data in the form of annual financial reports from 26 companies selected through purposive sampling and cleaned from outliers using the Interquartile Range (IQR) method. Data analysis used a paired sample t-test after the data met the assumption of normality. The results showed that there were no statistically significant differences in NPM, TATO, and ROE between the two periods. However, there was a significant difference in EM with a significance value of 0.006 (<0.05), indicating a shift in corporate funding strategies from a high-debt capital structure to a more conservative equity-based capital structure post-pandemic. These findings provide implications for management to maintain operational efficiency and leverage prudence, as well as for investors to make the infrastructure sector a defensive investment option.*
Keywords: *Du Pont system, Financial Performance, Covid-19 Pandemic , Infrastructure Sector, ROE*

1. INTRODUCTION

The Covid-19 pandemic has had a significant impact on Indonesia's infrastructure sector, reflected in the decline in company profitability and efficiency [1]. The phenomenon of PT Waskita Karya Tbk's losses reaching IDR 2.58-3 trillion in 2024 [2] indicates a long-term impact that needs to be studied. The infrastructure sector, as the backbone of national development [3], contributes 10.23% to GDP [4], so its financial performance is important to evaluate. Financial performance describes a company's ability to manage assets to generate profits [5] and measures financial health [6]. Financial performance assessment is crucial for business continuity [7], as Azmi, Wijaya, and Nugraha (2024) emphasize that financial performance analysis is a reference for operational sustainability [8].

Signaling theory explains that management provides signals to investors through financial reports [9]. Annual reports contain operational and financial performance information [10]. Indicators such as NPM, TATO, and EM provide quantitative signals that are analyzed by the market [11]. Priyatama and Pratini (2021) stated that profitability and capital structure information are important signals for investors in the infrastructure sector [12]. This study uses the Du Pont System because of its ability to perform integrated diagnoses by combining balance sheet and profit and loss elements [13]. This model breaks down ROE into three components: NPM (operational efficiency), TATO (asset utilization effectiveness), and EM (leverage policy) [14]. Wijaya et al. (2022) emphasize the importance of an integrated approach in evaluating financial performance [15].

NPM measures the efficiency of a company converting revenue into net profit [16]. Fazria et al. (2025) proved that NPM has a significant effect on financial performance [17]. TATO shows the effectiveness of asset utilization to generate sales [18]. EM measures the level of financial leverage [19]. ROE describes the contribution of equity in generating net profit [20]. Previous research shows various findings. Aprianto et al. (2024) found fluctuations in the performance of telecommunications companies [21]. Rahmandiansyah and Sodikin (2023) showed low ROI of construction companies [22]. Kusmiati and Sunardi (2023) concluded that transportation performance was quite good [23].

Susanto et al. (2023) found good performance of PT Mayora Indah [24]. Prastiti and Sulistiyo (2022) showed that PT Kalbe Farma's performance was not yet effective [18]. Kurniawati and Mubarrok (2024) found fluctuating performance of PT Jaya Konstruksi [25]. Anggraini and Febrianty (2022) showed that construction ROE performance was quite good [15]. Mursalin et al. (2023) found the highest property ROI of 8.38% [26]. Safitri et al. (2024) concluded that the performance of consumer goods companies was quite good [27] . Hardiyanti et al. (2022) showed a decrease in NPM during the pandemic [28]. Kawuri et al. (2022) found an increase in TATO after the pandemic [29]. This study aims to analyze significant differences in NPM, TATO, EM, and ROE of infrastructure companies on the IDX between the pandemic and post-pandemic periods.

2. METHOD

This study uses a quantitative descriptive method with a comparative approach. The study population is all infrastructure sector companies listed on the Indonesia Stock Exchange in 2020-2024, totaling 69 companies. The sampling technique used was purposive sampling with the following criteria: (1) actively and consecutively registered during the study period, and (2) published complete financial reports for the 2020-2024 period. The analysis tool used is SPSS (Statistical Product and Service Solution), a software that can be used in statistical analysis, especially in the fields of social sciences, business, health, and education [30].

A total of 47 companies met the initial criteria. To ensure the accuracy of the parametric statistical analysis, outliers were identified and removed using the Interquartile Range (IQR) method [31], resulting in 26 sample companies with a total of 130 observations (26 companies x 5 years). The research variables consisted of:

Net Profit Margin (NPM) = Net Profit / Revenue

Total Asset Turnover (TATO) = Revenue / Total Assets

Equity Multiplier (EM) = Total Assets / Total Equity

Return On Equity (ROE) = NPM × TATO × EM

Data were analyzed using descriptive statistics and hypothesis testing. Normality testing was performed using the *one-sample Kolmogorov-Smirnov test*. Since the data were normally distributed, the difference test used a *paired sample t-test* with a significance level of 5% .

3. RESULTS

Descriptive Statistics

Descriptive statistics show an average increase in all variables from the pandemic to the post-pandemic period. Average NPM increased from 7.46% to 10.95%, TATO from 0.5195 times to 0.5575 times, EM decreased from 1.9569 times to 1.8215 times, and ROE increased from 5.71% to 6.98%.

Table 1. *Paired Sample t-test* Results

Variables	Period	Min	Max	Mean
NPM	Pandemic	-0.27	0.37	0.0746
NPM	Post-pandemic	-0.17	0.44	0.1095
TATO	Pandemic	0.11	2.60	0.5195
TATO	Post-pandemic	0.05	2.60	0.5575
EM	Pandemic	-0.53	4.46	1,9569
EM	Post-pandemic	-0.39	4.39	1.8215
ROE	Pandemic	-0.18	0.27	0.0571
RE	Post-pandemic	-0.06	0.30	0.0698

Normality Test

Table 2. Normality Test Results

Variables	N	Asymp.Sig.	Information
NPM	26	0.662	Normal
TATO	26	0.832	Normal
EM	26	0.765	Normal

ROE	26	0.535	Normal

The *Kolmogorov-Smirnov* normality test showed that all variables had an Asymp. Sig. value > 0.05, indicating that the data were normally distributed and suitable for using the *paired sample t-test.*

Hypothesis Testing

Table 3. *Paired Sample t-test* Results

Variables	Mean Difference	t-count	Sig. (2-tailed)	Information
NPM	-0.03496	-1,878	0.072	Not Significant
TATO	-0.03792	-1,563	0.131	Not Significant
EM	0.13538	3,010	0.006	Significant
ROE	-0.01264	-1,215	0.236	Not Significant

Discussion

The results of the study show that NPM does not differ significantly (Sig. 0.072 > 0.05), in line with [21] that the company is capable of maintaining profitability margins . Stability This reflects the infrastructure company's success in implementing cost-efficiency strategies and operational adaptations during the crisis. Despite the pandemic's impact on revenue, the company was able to maintain profit margins through tight cost controls. Post-pandemic, revenue growth has been accompanied by an improved cost structure, resulting in stable NPM.

TATO no different significant (Sig. 0.131>0.05), different with [28] on sector mining. Characteristics infrastructure with income contract term long [3] cause stability, and this reflects the infrastructure company's success in implementing cost-efficiency strategies and operational adaptations during the crisis. Despite the pandemic's impact on revenue, the company was able to maintain profit margins through tight cost controls. Post-pandemic, revenue growth has been accompanied by an improved cost structure, resulting in stable NPM.

EM is significantly different with the average decrease being 0.1354 times (Sig. 0.006 < 0.05). In line with theory capital structure [19], the decline in EM reflects consolidation finance through strengthening equity post pandemic , according to findings Anggraini and Febrianty , shows that the optimal EM has a meaningful importance in support of ROE with good on company subsector construction 2016-2020 [15]. This decrease also reflects a shift in funding strategy from aggressive debt-based financing during the pandemic to a more conservative equity-based approach post-pandemic. Companies undertook financial consolidation through debt repayment and equity strengthening to mitigate long-term financial risk.

ROE no different significant (Sig. 0.236 > 0.05), different from [28]. ROE stability occurs because EM decline compensated increase in NPM and TATO [14]. Despite a significant decline in EM. ROE stability occurred because the decline in leverage was offset by an increase in NPM and TATO, which reflects improvements in operational efficiency and asset productivity. This indicates that the company is able to maintain its shareholder returns through strong business fundamentals, rather than relying solely on debt.

4. CONCLUSION

This study concludes that no there is difference significant impact on the company's NPM, TATO, and ROE infrastructure between period pandemic And post pandemic. . However , there are difference significant on EM, indicating change strategy funding going to more capital structure conservative based equity post pandemic .

Implications: Theoretical strengthening of the theory signal through EM decline as a signal management risk . Implications practical : management needs to maintain policy *leverage* conservative (EM 1.8-2.0) and increase operational efficiency. Investors can make sector infrastructure a defensive .

Study furthermore recommended expand sample to ASEAN companies , adding period observation, as well as use panel data regression with macroeconomic variables.

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