

THE EFFECT OF CAPITAL EXPENDITURE ON RETURN ON EQUITY: DUPONT APPROACH ANALYSIS

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Abstract

This study examines the effect of CapEx on ROE using the DuPont Analysis framework and investigates the mediating roles of NPM, TAT and EM in this relationship. The study employs a quantitative approach using panel data from seven companies over the 2020-2024 period, yielding 35 observations. Data are analyzed using panel data regression with Fixed Effect and Random Effect Models, while mediation effects are assessed using the Sobel test. The findings reveal that Capital Expenditure does not have a direct significant effect on ROE. However, Capital Expenditure has a significant effect on Net Profit Margin, while its effect on Total Asset Turnover and Equity Multiplier is not significant. Mediation analysis indicates that Net Profit Margin significantly mediates the relationship between Capital Expenditure and ROE. In contrast, Total Asset Turnover shows limited mediating evidence, and Equity Multiplier does not mediate the relationship. These results suggest that the impact of Capital Expenditure on financial performance primarily operates through profitability rather than asset efficiency or leverage structure. This study contributes by clarifying the transmission mechanism of investment decisions to shareholder returns within the DuPont framework and provides practical implications for corporate managers in optimizing capital allocation decisions.

Keywords: capital expenditure, return on equity, dupont analysis

JEL Classification: G31, G32, M41, L65 and L11

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INTRODUCTION

Management plays a significant role in a company's growth and competitiveness, which contributes significantly to its financial performance. Return on Equity (ROE), which measures a company's ability to make money from shareholders' investments, is one of the most important indicators of financial performance. Investors consider ROE to be a key metric for evaluating capital management, profitability, and long-term growth potential (Weidman et al., 2019).

In the context of this study, the analysis focuses on companies operating in the healthcare sector, particularly the pharmaceutical and consumer health subsector, which is characterized by high capital intensity, continuous innovation and strict regulatory requirements. These characteristics make financial performance and investment efficiency critical issues in sustaining competitiveness and growth.

Capital Expenditures (CAPEX) play a significant role in influencing ROE. CAPEX refers to the funds a company invests in fixed assets to increase production capacity and operational efficiency. While large investments in CAPEX are often expected to correlate with increased ROE, relationship is more complex. The direct impact on ROE may not be apparent due to the reliance on effective asset management to translate these investments into tangible increases in revenue and profit (Majanga, 2018). Furthermore, technological changes, market conditions, and operational strategies also mediate this relationship, necessitating a more comprehensive analysis to understand the direct and indirect impacts of CAPEX on ROE.

The DuPont analysis framework provides a comprehensive way to analyze ROE components through three crucial dimensions: Net Profit Margin (NPM), which indicates profitability; Total Asset Turnover (TAT), which reflects asset utilization efficiency; and Equity Multiplier (EM), which reflects financial leverage (Shan et al., 2024). According to the DuPont model, incremental ROE increases can be achieved not only through increasing net income but also through optimizing asset utilization and improving capital structure. This highlights the importance of mediating variables such as NPM, TAT, and EM in understanding how CapEx influences ROE (Alali, 2019; Weidman et al., 2019; Wu, 2023).

This study aims to analyze the relationship between CapEx and ROE by incorporating three mediating variables: NPM, TAT, and EM, using the DuPont analytical framework. This study utilizes an empirical dataset comprising 35 observations from seven companies in the healthcare (pharmaceutical and consumer health) sector listed on the Indonesia Stock Exchange, spanning from 2020 to 2024. This analysis aims to provide deeper insight into the dynamics between corporate investment decisions and shareholder returns, specifically in relation to operational efficiency and financial structure (Akhmadi & Januarsi, 2021).

The main hypotheses include the direct effect of CapEx on ROE and its indirect effect mediated through NPM, TAT, and EM. This study is expected to provide useful guidelines for corporate investment strategies and capital structure policies aimed at maximizing shareholder value (Sayed & Nefzi, 2024).

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Signaling Theory

The signaling theory is important to understanding how companies communicate key information to investors and reduce information asymmetry. Corporate investment decisions, especially those involving capital expenditure (CapEx), function as significant signals of a company's growth prospects and operational capacity (Weidman et al., 2019).

This effect is evident in the DuPont Analysis framework, which breaks down Return on Equity (ROE) into three fundamental elements: Net Profit Margin (NPM), Total Asset Turnover (TAT), and Equity Multiplier (EM) (Bai et al., 2022). This analysis uses CapEx as one of the crucial inputs influencing these components, which translates management's investment signals into measurable performance. When analyzing corporate-level investment decisions such as CapEx, understanding these ratios is crucial. Increasing CapEx can reduce asset dilution, thus positively increasing TAT and ROE, as well as impacting NPM and increasing earnings (Majanga, 2018).

Consequently, companies that successfully communicate their investment strategy through CapEx signals can better manage investor expectations and align their operational strategy with long-term goals, thus increasing shareholder value.

The Effect of Capital Expenditure on ROE

From a signaling theory perspective, capital expenditure (CapEx) plays a crucial role as an indicator of a corporation's profitability prospects. This view aligns with the assertion that CapEx decisions send signals to the market about a company's potential to generate future value and increase productivity. Specifically, CapEx investments are associated with increased production capacity, which can strengthen a company's competitive position in the market (Moser et al., 2021).

Additionally, CapEx is related to operational efficiency that improves company margins and ultimately contributes to increased Return on Equity (ROE) through improvements in net profit margin (NPM) and total asset turnover (TAT) (Parzonko et al., 2023). Using the DuPont formula, ROE can be broken down into its components: $ROE = NPM \times TAT \times EM$ (Equity Multiplier), where each component reflects a critical financial performance metric (Parzonko et al., 2023).

Empirical studies have highlighted this duality, emphasizing that while appropriate CapEx drives operational improvements that lead to increased ROE in the long run, excessive CapEx can lead to underperforming assets if sales and revenue generation do not keep pace with asset expansion (Lebre-Rodrigues et al., 2023).

H1 = Capital Expenditure significantly affects Return on Equity by affecting NPM, TAT or EM

The Effect of Capital Expenditure on Net Profit Margin (NPM)

Capital Expenditure (CapEx) refers to investments made in fixed assets to increase production capacity and operational efficiency. This expenditure is crucial for companies seeking to increase profit margins and reduce long-term operating costs. Studies show that effective CapEx management is crucial for optimizing production processes and improving overall financial performance (Bhabra & Rooney, 2020).

Companies that prioritize or manage capital expenditures efficiently often improve their ability to capitalize on market opportunities, achieve operational excellence, and maintain a healthier profit profile (Reznikov, 2023; Widarwati et al., 2024). For example, research shows that the marginal value of CapEx has increased in the post-Sarbanes-Oxley environment, indicating a significant relationship between CapEx and firm value (Bhabra & Rooney, 2020).

H1a = Capital Expenditure has a positive effect on Net Profit Margin

The Effect of Capital Expenditure on Total Asset Turnover (TAT)

The relationship between Capital Expenditure (CapEx) and Total Asset Turnover (TAT) is crucial in evaluating a company's operational efficiency and profitability. TAT is a financial metric that reflects a company's effectiveness in utilizing its assets to generate sales. Evidence suggests that a well-planned CapEx strategy can improve asset efficiency, as revealed in a study (Majanga, 2018), which examined the relationship between CapEx and market capitalization and identified the relationship between effective capital allocation and financial performance.

Conversely, suboptimal CapEx tend to increase total assets without being offset by commensurate sales growth, thereby reducing asset utilization rate and leading to a decline in TAT. This asymmetric impact can be explained through several key mechanisms, namely the existence of a time-to-build effect that creates a lag between investment and its contribution to revenue (Huy et al., 2023; King et al.,

2021), the emergence of idle capacity due to overinvestment or mismatch with market demand (Khurong et al., 2025; N. Li & Fan, 2024; Wang & Shao, 2024), and the presence of agency problems that drive investment misallocation and reduce asset utilization efficiency (Chowdhury et al., 2025).

From a theoretical perspective, these findings are consistent with agency theory and the concept of investment inefficiency, where information asymmetry and weak oversight mechanisms can lead to suboptimal investment decisions and negatively impact asset productivity (King et al., 2021). However, the effectiveness of CapEx in improving TAT is significantly influenced by the quality of corporate governance and the efficiency of the internal capital market, which can mitigate the risk of misallocation and enhance alignment between investment, asset utilization and sales growth (Cheng & Wu, 2018; Z. Li et al., 2021; Xiao et al., 2021).

Empirical evidence also suggests that markets tend to respond negatively to investment inefficiencies whether in the form of overinvestment or underinvestment as these are perceived as signals of future performance declines, including asset efficiency and TAT (N. Li & Fan, 2024; Wang & Shao, 2024). Nevertheless, under certain conditions, strategic CapEx can still yield long-term benefits after passing through an adjustment phase and reaching optimal utilization levels (King et al., 2021).

Therefore, effective CapEx planning, alignment with market demand and strengthening of governance and oversight mechanisms are key factors in maintaining asset productivity and sustaining optimal TAT performance across various market conditions (Cheng & Wu, 2018; Kang & Byun, 2020).

H1b = Capital Expenditure to Total Asset Turnover (TAT)

The Effect of Capital Expenditure on the Equity Multiplier (EM)

The Equity Multiplier (EM), an important metric for understanding leverage, is fundamentally influenced by capital expenditure (CapEx). The relationship between CapEx financing and EM is determined by the funding source used. The financing of CapEx through debt leads to an increase in leverage, which in turn increases EM. Conversely, if CapEx funding comes from equity or internally generated revenue, the EM may remain stable, reflecting minimal changes in leverage (Siqueira et al., 2018).

Large capex projects are expected to be financed externally (via debt) since companies are expected to generate increased cash flows in the future, justifying increased leverage (Correa-Caro et al., 2021; Eckbo & Kissner, 2021). On the other hand, retaining earnings or reinvesting internal funds for CapEx often results in stability in EMs. Capital expenditures directly affect the equity multiplier. Empirical studies support this hypothesis by analyzing the effect of financing choices on capital structure across different firm sizes, highlighting the importance of financing source decisions in financial strategy (Machokoto et al., 2021).

Furthermore, the interaction between risk aversion, particularly in family-controlled firms, has been observed to influence CapEx allocation and financing strategies, often resulting in conservative leverage adjustments (H. Li & Ryan, 2022). Overall, the relationship between CapEx financing and EM is multifaceted, supported by significant empirical evidence and theoretical consistency. This in-depth understanding emphasizes the importance of firms carefully managing their financing decisions to optimize their capital structure while aligning with their growth strategy.

H1c = Capital Expenditure to Equity Multiplier (EM)

The Effect of Net Profit Margin on ROE

The DuPont Model is a widely recognized method for analyzing the factors influencing a company's Return on Equity (ROE), with a primary focus on the interrelationship between profitability ratios, particularly Net Profit Margin (NPM). The assertion that higher NPM leads to higher net profit,

which ultimately increases ROE, is a fundamental principle evident in numerous empirical studies. Higher efficiency in cost management and adaptive pricing strategies significantly improve NPM, thereby strengthening ROE (Paul, 2021; Shabani et al., 2021).

A high NPM indicates that the company retains a significant portion of its revenue as profit, which directly increases ROE when (Anarfi et al., 2016). Various studies have highlighted that increasing NPM through strategic pricing and efficient cost management not only improves the company's perceived profitability but also strengthens shareholder returns through increased ROE (Bai et al., 2022).

These efficiencies can be observed across multiple sectors indicating that practices leading to high NPM are widely applicable across industries, supporting the DuPont analysis's key claim that profit metrics serve as vital indicators of financial success (Baran et al., 2022).

The DuPont model, where higher net profit margins lead to increased net income and subsequently increased Return on Equity, is not merely theoretical but is supported by numerous empirical studies. Effective cost management and appropriate pricing strategies are therefore the foundation for companies aiming to optimize financial returns for shareholders (Shabani et al., 2021).

H1d = Net Profit Margin to ROE

The Effect of Total Asset Turnover on ROE

Total asset turnover (TAT) measures how efficiently a company utilizes its assets to generate revenue within the DuPont framework. Efficient asset utilization is crucial for increasing return on equity (ROE), as it demonstrates the effective contribution of assets to generating revenue. Specifically, when a company operates with a high asset turnover rate, this typically leads to increased output and higher profit margins, which in turn increases ROE. Conversely, the presence of unused assets negatively impacts sales, leading to decreased asset productivity and ultimately depressing ROE (Bai et al., 2022; Benjamin et al., 2018).

The hypothesis that total asset turnover has a positive effect on ROE is supported by various empirical analyses using the DuPont Model. Research shows that increased asset turnover reflects more efficient asset utilization and is therefore positively correlated with increased ROE across various sectors (Филимонова et al., 2020). DuPont analysis explains that ROE is not only a function of profitability through profit margins but also the effectiveness of asset utilization as indicated by total asset turnover. This framework essentially provides a clearer perspective for managers to identify operational inefficiencies and areas for improvement, with the aim of improving financial performance (Bai et al., 2022). Additionally, the relationship between TAT and ROE is consistently emphasized in the literature that the hypothesis of TAT has a positive influence on ROE in various sectors (Gomes & Oliveira, 2021).

H1e = Total Asset Turnover to ROE

The Effect of Equity Multiplier on ROE

The Equity Multiplier (EM), which represents the use of leverage, indicates that at optimal levels, leverage can increase Return on Equity (ROE) due to the funding multiplier effect. Research by Arhinful & Radmehr (2023), demonstrates a correlation between increased leverage (via the equity multiplier) and ROE, noting that even a small increase in a company's equity multiplier can lead to a significant increase in the ROE metric. Their findings support the proposition that moderate leverage can have a positive impact on financial performance, thereby increasing profitability. Furthermore Rifana & Geetha (2022), highlight the relationship between financial leverage and ROE, noting that increased financial leverage is positively correlated with increased ROE; however, they caution that excessive debt can harm overall earnings per share. Leverage can be a useful financial tool when managed properly, but poorly managed leverage can expose companies to considerable financial risks.

H1f = Equity Multiplier to ROE

The Influence of Net Profit Margin Mediates the Relationship Between Capital Expenditure and ROE

The effect of CapEx on ROE is complex and may not always result in immediate gains, but rather create an environment conducive to future profitability. This is evident in sectors where long-term investments in resources drive operational improvements, leading to sustained increases in NPM and ultimately to increased ROE over time (Xu & Liu, 2021). Therefore, the hypothesis that NPM acts as a mediator in the effect of CapEx on ROE is supported by the existing literature, highlighting the crucial role of efficient financial management and strategic capital investment in driving firm performance metrics. The mediation of NPM in the effect of CapEx on ROE signals a deeper understanding of the role of capital investment within the framework of firm profitability.

H2a = Net Profit Margin mediates the relationship between Capital Expenditure and ROE

The influence of Total Asset Turnover mediates the Relationship Between Capital Expenditure and ROE

Capital Expenditure (CapEx) effectiveness is closely related to asset utilization efficiency, which is primarily reflected in throughput and total asset turnover (TAT). A higher TAT indicates that CapEx effectively contributes to improved financial performance. Increased operational capacity can lead to an increase in TAT, which increases revenue and returns on equity (ROE).

Empirical studies emphasize that optimizing production capacity and maintaining high asset utilization rates are crucial for achieving better financial returns. Goswami & Daultani, (2023), show that companies that maintain optimal production capacity utilization often experience higher revenues, clearly illustrating the relationship between capacity, utilization, and performance. The relationship between company performance, as measured by ROE, and the efficiency of its asset utilization, reinforces that increasing revenue not only improves ROE but is also vital for operational success (Gu, 2021).

Therefore, understanding and optimizing the relationship between CapEx, asset utilization, and TAT is crucial for companies seeking to efficiently improve financial performance. Overall, the discussion on capacity utilization highlights its significant role in capital investment strategy and the need to maintain optimal asset performance to effectively utilize CapEx.

H2b = Total Asset Turnover mediates the relationship between Capital Expenditure and ROE

The influence of the Equity Multiplier Mediating the Relationship Between Capital Expenditure and ROE

Capital Expenditure (CapEx) plays a critical role in shaping a company's leverage, which in turn affects Return on Equity (ROE) through the leverage multiplier effect. Due to the leverage effect, an increase in CapEx can increase the Equity Multiplier (EM), which can increase ROE.

The relationship between CapEx and leverage has been emphasized in various studies. According to Shubita (2023), companies with higher ROE tend to have better access to internal financing, thus reducing reliance on debt. This highlights the importance of CapEx as a determinant of leverage, with companies often seeking to improve their operational capacity and competitiveness through such investments. Further analysis by Arhinful & Radmehr (2023), shows that financial leverage significantly affects ROE in non-financial institutions, suggesting a correlation between debt levels and corporate profitability as measured by ROE.

This supports the idea that increased equity ratios driven by higher CapEx can magnify returns, thereby improving overall profitability.

H2c = Equity Multiplier mediates the relationship between Capital Expenditure and ROE

Figure 1. Framework

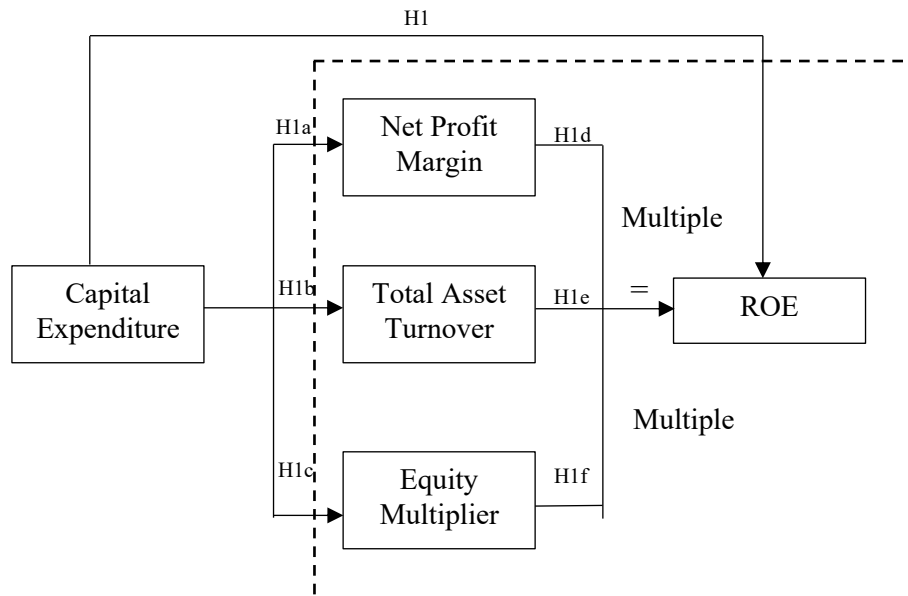
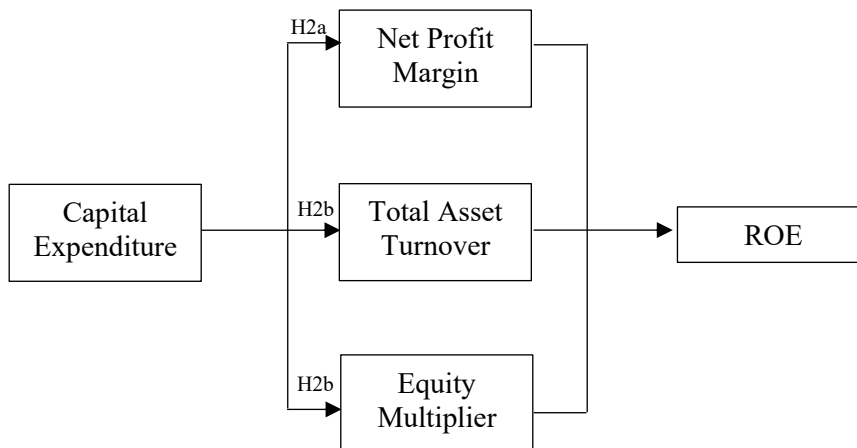


Figure 2. Mediation framework



METHODS

The sample in this study consisted of seven companies in the healthcare sector (pharmaceutical and consumer health subsectors) listed on the Indonesia Stock Exchange (IDX) during the 2020-2024 period, resulting in 35 observations. The sampling technique used was purposive sampling, with specific criteria established to ensure the relevance and consistency of the data.

The sample selection criteria were as follows:

- 1) Companies must be listed in the healthcare sector on the Indonesia Stock Exchange (IDX) during the entire observation period (2020-2024);

- 2) Companies must publish complete and consistent annual financial statements for the period under study;
- 3) Companies must have the required financial data to calculate all research variables, including CapEx Intensity, NPM, TAT, EM and ROE;
- 4) Companies must not experience delisting or significant structural changes that could affect data comparability during the observation period.

DuPont analysis, a widely used financial analysis method, breaks down a company’s ROE into its components, NPM, TAT and EM. This approach allows for a deeper understanding of profitability drivers, including operational efficiency, competitiveness, and model structure. According to (Bai et al., 2022), integrating profitability and efficiency ratios provides a deeper understanding of a company's performance dynamics and risks.

DuPont analysis formula:

$$ROE = \frac{Net\ Profit}{Sales} \times \frac{Sales}{Average\ Total\ Assets} \times \frac{Average\ Total\ Assets}{Average\ Equity}$$

Or in a more concise form:

$$ROE = Net\ Profit\ Margin \times Total\ Asset\ Turnover \times Equity\ Multiplier$$

From this formulation, ROE is divided into three: Net Profit Margin (NPM), Total Asset Turnover (TAT), and Equity Multiplier (EM). Overall, empirical findings across sectors confirm that DuPont analysis has become a standard tool in evaluating financial performance across various industries (Nuarika et al., 2021; Shan et al., 2024). With its ability to decompose the multifaceted nature of ROE into more easily interpreted components, DuPont analysis supports strategic decision-making regarding profitability, efficiency, and capital leverage, and confirms its role as a relevant and valuable financial diagnostic tool (Z. Ma, 2025).

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1. Descriptive Statistics

	ROE	Capital Expenditure	NPM	Total Asset Turnover	Equity Multiplier
Mean	18.57191	18632.46	11.86594	1.254943	1.459971
Median	16.01200	15815.00	8.858000	1.094000	1.443000
Maximum	37.67900	52270.00	31.35800	1.980000	2.116000
Minimum	9.784000	8.870000	2.794000	0.716000	1.139000
Std. Dev.	7.360357	17402.76	7.791443	0.371579	0.272748
Observations	35	35	35	35	35

Source: Bloomberg (2025)

Descriptive statistics show that the average ROE of the sample companies was 18.57% with a range of 9.78% to 37.67%, reflecting relatively good profitability, although this varied across companies. Capital Expenditure averaged 18,632.46 with a significant difference (minimum 8.87 and maximum 52,270.00), indicating a gap in fixed asset investment. Meanwhile, the average NPM was 11.87%, with a variation of 2.79% to 31.35%, indicating differences in profit margins across companies. The TAT averaged 1.25, ranging from 0.71 to 1.98, while the EM averaged 1.45 with a minimum value of 1.13

and a maximum value of 2.11, reflecting a relatively low level of company leverage. Overall, these results illustrate that the financial performance of the sample companies is quite diverse, requiring further analysis to examine the interplay between variables.

Model Selection Test

Chow Test

Based on the test results in Model 1 (without mediation), the Cross-section F probability value was obtained at 0.0000, which is smaller than (<0.05). This indicates that the Fixed Effect model is more appropriate to use. Furthermore, in Model 2 (with mediating variables), the Chow test results also showed equally significant probability values (0.0000) for all tests, both on Capital Expenditure against NPM, Total Asset Turnover, Equity Multiplier, and on ROE through mediating variables. This reaffirms that the Fixed Effect Model is the best model that can be used.

Thus, it can be concluded that for all models tested, both without mediation and with mediation, the Fixed Effect Model (FEM) approach is the most appropriate model for analyzing the relationship between variables.

Hausman Test

Based on the test results in Model 1 (without mediating variables), a probability value of 0.8142 (> 0.05) was obtained. This indicates that the Random Effect Model is more appropriate for this model. Furthermore, in Model 2 (with mediating variables), Capital Expenditure on NPM shows a probability of 0.4250 (> 0.05), so the appropriate model is the Random Effect Model. Capital Expenditure on Total Asset Turnover has a probability of 0.3149 (> 0.05), so the Random Effect Model is again more appropriate. Capital Expenditure on Equity Multiplier produces a probability of 0.0709 (> 0.05), which is still greater than 0.05, so the model used remains the Random Effect Model.

However, when the three mediating variables (NPM, TAT, and EM) were tested simultaneously to mediate the effect of Capital Expenditure on ROE, a probability of 0.0004 (0.050) was obtained. This indicates that in a full model with mediators, the Fixed Effect Model (FEM) is more appropriate. Therefore, it can be concluded that for models without mediation and models with individual mediators (NPM, TAT, EM), the appropriate approach is the Random Effect Model. Meanwhile, in a full model with all three mediating variables simultaneously, the best model used is the Fixed Effect Model (FEM).

Classical Assumption Test

Multicollinearity Test

The multicollinearity test yielded a correlation value of <0.80 for each variable. Therefore, it can be concluded that this study is free from multicollinearity issues, and the variables used are suitable for inclusion in subsequent regression models.

Heteroscedasticity Test

Based on the test results for Model 1 (without mediating variables), the probability value for the Capital Expenditure variable was 0.9605 (>0.05). This indicates that there is no heteroscedasticity problem in the model. Similarly, for Model 2 (with mediating variables), the overall results were greater than 0.05 (>0.05).

Consequently, it can be concluded that neither Model 1 nor Model 2 has a serious heteroscedasticity problem. The regression model used meets the classical assumptions regarding homoscedasticity, so the estimation results can be considered valid for use in further testing.

Normality Test

Based on the test results, the residual histogram shows a normal distribution pattern. This is supported by a probability value of 0.074057. Since the probability value is > 0.05 , it can be concluded that the residuals in the regression model are normally distributed.

Hypothesis Testing

t-Test

The t-test results for Model 1 (without mediating variables) indicate that Capital Expenditure has a probability value of 0.5372 (>0.05), thus concluding that Capital Expenditure has no significant effect on ROE. Therefore, the hypothesis that Capital Expenditure directly influences ROE is not supported in this model.

In Model 2 (with mediating variables), Capital Expenditure has a probability of 0.0450 (<0.05) on NPM, indicating a significant effect on NPM. Capital Expenditure has a probability of 0.5596 (>0.05), indicating that Capital Expenditure has no significant effect on Total Asset Turnover. Capital Expenditure has a probability of 0.1898 (>0.05), indicating that Capital Expenditure has no significant effect on Equity Multiplier.

Then, in Model 2, the variables Capital Expenditure, NPM, TAT, and EM affect ROE. Capital Expenditure has a probability of 0.5113 (>0.05), meaning it has no significant effect on ROE when the mediating variable is included. NPM has a significant effect on ROE with a probability of 0.0000 (<0.05). Total Asset Turnover also has a significant effect on ROE with a probability of 0.0001 (<0.05). Equity Multiplier has a significant effect on ROE with a probability of 0.0000 (<0.05).

F test

Based on the results of the F test in Model 1 (without mediating variables), a probability value of 0.531295 (> 0.05) was obtained. This result indicates that Capital Expenditure does not have a significant effect on ROE when tested directly. Meanwhile, in Model 2 (with mediating variables), the test results show a significant difference. Among the mediating variables, NPM had a probability value of 0.000000, Total Asset Turnover had a probability value of 0.000000, and Equity Multiplier had a probability value of 0.000000. These three results indicate that Capital Expenditure simultaneously has a significant effect on all mediating variables. This indicates that NPM, Total Asset Turnover, and Equity Multiplier have strong potential as a mediating pathway in the relationship between Capital Expenditure and ROE. Furthermore, when all three mediating variables (NPM, TAT, and EM) are entered simultaneously in the model, a probability value of 0.000000 is obtained. These results indicate that the regression model in the mediating variables is significant simultaneously, so it can be concluded that Capital Expenditure has an effect on ROE through the role of these mediating variables.

Coefficient of Determination (R-squared)

The Adjusted R-squared value for Model 1 (without mediating variables) was -0.017955. This value is very low, even negative, indicating that the independent variable (Capital Expenditure) is unable to explain variations in ROE. This is in line with the previous F-test results, which stated that Model 1 was insignificant. Furthermore, in Model 2 (with mediating variables), the value increased significantly. The Adjusted R-squared for Capital Expenditure against each mediating variable was obtained as follows: 0.981801 for the NPM, 0.941752 for the Total Asset Turnover, and 0.787441 for the Equity Multiplier. These results indicate that Capital Expenditure is able to explain more than 78% to 98% of the variations that occur in the three mediating variables. Thus, Capital Expenditure has a very strong influence on NPM, TAT, and EM. Furthermore, when the three mediating variables (NPM, TAT, and

EM) were tested simultaneously to explain the effect of Capital Expenditure on ROE, the Adjusted R-squared was 0.959414. This result confirms that approximately 95% of the variation in ROE can be explained by Capital Expenditure through the mediation pathway of NPM, TAT, and EM. The remaining 3% is explained by other factors outside the research model.

Table 2. Sobel test

Variabel	t count	t table	Information	Result
CAPEX→NPM→ROE	2,07	2,04	t count > t table	Significant
CAPEX→TAT→ROE	0,59	2,04	t count < t table	Not Significant
CAPEX→EM→ROE	1,31	2,04	t count < t table	Not Significant

Source: Eviews 12 Software (2025)

DISCUSSION

The Effect of Capital Expenditure on ROE

The test results show that CapEx has no significant effect on ROE, either in the model without mediation ($p = 0.5372$) or in the model with mediator ($p = 0.5113$). This finding indicates that increasing fixed asset investment has not been able to generate increased returns for shareholders in the short term.

Theoretically, these results are consistent with Signaling Theory, which states that CapEx signals long-term investment, so its financial benefits are not always immediately reflected in ROE. These findings also support the literature emphasizing that CapEx only increases ROE if the investment results in substantial increases in net income or operational efficiencies (Majanga, 2018). This suggests that, at least in the short term, increased fixed asset investment does not result in increased returns to shareholders, a conclusion supported by previous empirical findings suggesting that immediate financial benefits from such long-term investments cannot be expected (Kwistianus & Juniarti, 2022).

Analyzing the context of the research sample, it is apparent that variations in CapEx across companies highlight imbalances in asset utilization capabilities. This inconsistency implies that temporary inefficiencies in utilizing new assets may be a contributing factor to CapEx's inability to directly improve ROE. Indeed, previous studies have noted that while CapEx should theoretically improve company performance, often only significant profit increases, driven by effective asset management, have a positive impact on ROE.

The Effect of Capital Expenditure on Net Profit Margin (NPM)

The t-test results show that CapEx has a significant effect on NPM ($p = 0.0450$). This finding indicates that companies that increase CapEx are able to achieve increased profit margins, likely due to cost efficiencies and increased production capacity. Investment in fixed assets can reduce operational costs and increase profitability (Bhabra & Rooney, 2020).

Especially Darko et al., (2016), discusses how strategic asset governance and management can improve financial performance, although the direct relationship with CapEx and NPM remains complex and requires further investigation. Therefore, it is reasonable to conclude that increased CapEx can contribute to increased profit margins for companies that strategically manage these investments, although the evidence landscape suggests that more detailed investigation is needed to fully understand these relationships.

The Effect of Capital Expenditure on Total Asset Turnover (TAT)

The test results show that CapEx has no significant effect on TAT ($p = 0.5596$). The literature suggests that the insignificant short-term effect of CapEx on TAT in the pharmaceutical sector can be explained by the industry's capital intensive nature, long investment payback periods, and strong regulatory and innovation-driven environment. Investments in fixed assets such as production facilities, laboratories and research infrastructure require substantial time before contributing to revenue generation, creating a time lag between CapEx and sales growth (Nandy, 2020; Su et al., 2021).

Furthermore, strict regulatory requirements and market readiness constraints often lead to temporary underutilization of assets, which can suppress TAT in the short run despite increased investment (Nandy, 2022; Raza et al., 2024; Su et al., 2021). Therefore, the insignificant relationship between CapEx and TAT should be interpreted as a reflection of structural industry characteristics rather than as evidence of inefficient investment decisions (Nandy, 2022; Su et al., 2021).

However, several studies indicate that CapEx and R&D investments may generate positive long-term effects once assets reach optimal utilization and production scales are achieved, even though their short-term impact on TAT remains limited (Chircop et al., 2024; Nandy, 2020; Su et al., 2021). Additionally, factors such as corporate governance debt structure and intangible asset dynamics may influence the magnitude and timing of CapEx effect leading to variation across firm and countries (Paridhi et al., 2024; Saona & Martín, 2025).

The Effect of Capital Expenditure on the Equity Multiplier (EM)

The regression results show that CapEx has no significant effect on EM ($p = 0.1898$). This indicates that changes in CapEx in the study sample are not accompanied by changes in funding structure, particularly leverage. However, the data shows that companies are more likely to use internal funding or equity, resulting in relatively stable EM.

This narrative challenges leverage theory highlighting nuances in corporate financing strategies where internal funds act as a stabilizing force, particularly in emerging markets (Choi & Suh, 2017).

The Effect of Net Profit Margin (NPM) on ROE

The t-test results show that NPM has a positive and significant effect on ROE ($p = 0.0000$). NPM is a core component of profitability in the DuPont model, so this finding is highly consistent theoretically.

This finding confirms that companies with better profit margins directly increase returns to shareholders. Increased NPM is a key determinant of ROE (Bai et al., 2022).

The Effect of Total Asset Turnover (TAT) on ROE

TAT has a significant positive effect on ROE ($p = 0.0001$). This result is consistent with the DuPont formula, where efficient asset utilization increases a company's ability to generate profits, which in turn increases ROE. Companies that are able to maximize their assets to generate higher revenues will record higher ROE. This finding supports research (Benjamin et al., 2018).

The Effect of Equity Multiplier (EM) on ROE

The test results show that EM has a positive and significant effect on ROE ($p = 0.0000$). This indicates that moderately managed leverage can increase ROE through the multiplier effect on financing. According to Arhinful & Radmehr, 2023; Rifana & Geetha (2022), optimal debt use can increase shareholder profitability.

The influence of Net Profit Margin Mediates the Relationship Between Capital Expenditure and ROE

The Sobel test shows that NPM significantly mediates the relationship between CapEx and ROE ($t = 2.07 > 2.04$). This means that CapEx affects ROE by increasing company profitability. This interpretation is in good agreement with the DuPont framework and the long-term investment literature (Xu & Liu, 2021).

The Effect of Total Asset Turnover Mediates the Relationship Between Capital Expenditure and ROE.

The Sobel test shows that TAT does not mediate the relationship between CapEx and ROE ($t = 0.59 < 2.04$). The absence of this mediation effect indicates that increased CapEx is not correlated with improvements in asset efficiency as measured by TAT, indicating that increased asset utilization has not been achieved as a result of increased capital investment (Gharaibeh & Bani Khaled, 2020).

The insignificance of TAT as a mediator between CapEx and ROE is primarily due to time lag effects in asset productivity, especially in capital intensive industries where CapEx does not immediately translate into short-term performance (Jardak & Hamad, 2022; Zhang & Şirin, 2024). The mediating role of TAT is also time-dependent, with effects emerging gradually and becoming more evident over the long term (Liu et al., 2019; Shuwaikh et al., 2023). Thus, this insignificance reflects temporal dynamics and industry characteristics rather than weak variable relationships. Methodologically, the use of lagged variables or dynamic models is recommended to better capture delayed effects (Ali et al., 2021; Mendoza-Velázquez et al., 2022; Tournus et al., 2022).

The influence of the Equity Multiplier Mediates the Relationship Between Capital Expenditure and ROE

Sobel's results indicate that EM does not mediate the relationship between CapEx and ROE ($t = 1.31 < 2.04$). This is because CapEx does not significantly affect corporate leverage. The sample companies use internal funding sources for CapEx, so changes in CapEx do not affect EM.

According to (Ferrando et al., 2017), companies with spare debt capacity prefer internal funding for abnormal investments, indicating that capital structure can be significantly influenced by the availability of internal funds. The proportion of internally financed capital expenditures plays a significant role in increasing corporate debt, indicating that reliance on internal funding reduces the operational need for external leverage, further confirming that financing strategy can influence capital structure dynamics (G. Ma & Chen, 2019).

The literature indicates that the mediating role of leverage (EM) in the relationship between CapEx and ROE is context dependent and not consistently significant, varying across sectors, governance structures and firm characteristics (Ouni et al., 2022; Ronoowah & Seetanah, 2023). In contrast, CapEx more commonly influences profitability through operational channels such as sales growth and efficiency improvements rather than through leverage mechanisms (Rehman et al., 2019).

Accordingly, the insignificant mediating role of EM suggests that the relationship between CapEx and ROE in this context is primarily driven by operational performance rather than financing structure indicating a relatively limited role of leverage as a transmission mechanism.

CONCLUSION AND SUGGESTIONS

This study aims to analyze the effect of Capital Expenditure (CapEx) on Return on Equity (ROE) using the DuPont Analysis framework, and to test the mediating role of Net Profit Margin (NPM), Total Asset Turnover (TAT), and Equity Multiplier (EM) in explaining this relationship. Based on panel data

analysis of sample companies during the study period, empirical results indicate that CapEx has an influence on the company's financial performance, but this influence is not fully translated directly into an increase in ROE.

The results indicate that CapEx significantly influences several DuPont components, particularly those related to operational efficiency and the company's financial structure. A mediation analysis shows that NPM, TAT, and EM do not significantly mediate the relationship between CapEx and ROE. This finding suggests that the company's capital investments have not optimally increased shareholder profitability through profitability, asset efficiency, or financial leverage.

These findings provide important implications: increased capital expenditures do not automatically result in improved equity performance without efficient cost management, optimal asset utilization, and an appropriate funding structure. Therefore, CapEx effectiveness is highly dependent on the quality of investment implementation and the company's operational strategy after the investment is made.

This study is subject to several limitations. First the relatively small sample size consisting of only seven companies, may limit the generalizability of the findings and should therefore be interpreted with caution. Second, the observation period 2020-2024 may not fully capture the long-term effect of CapEx particularly in capital intensive industries such as the healthcare sector where the benefits of investment tend to materialize gradually. Theoretically, this study enriches the literature by integrating CapEx and DuPont Analysis into a single empirical framework to explain corporate financial performance. Practically, the results of this study provide input for management and investors that long-term investment decisions need to be evaluated not only by the amount of capital expenditure, but also by its impact on the fundamental components of financial performance that form ROE. Future research is recommended to expand the sample coverage, extend the observation period, and consider other variables such as management quality, innovation, and macroeconomic conditions to gain a more comprehensive understanding of the relationship between capital investment and corporate financial performance.

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