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Capital Efficiency Based on Payment Capability (CEPac) as a Mediator Between Asset Structure, Sales Growth, and Firm Value: Evidence from Indonesian Manufacturing Firms

Faisal Riza Rahman✉[1], Maduretno Widowati[2], Sugeng Wahyudi[3]
Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia[1,3]
Management Department, Sekolah Tinggi Ilmu Ekonomi Pelita Nusantara, Indonesia[1,2]

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Abstract

This study introduces and empirically validates CEPac as a mediating construct linking asset structure and sales growth to firm value. Grounded in Trade-Off Theory, Resource-Based View, and Signaling Theory, CEPac integrates the inverse of the Weighted Average Cost of Capital (1/WACC) and Times Interest Earned (TIE) to capture financing efficiency and debt-servicing capacity. Using panel data from 75 manufacturing firms listed on the Indonesia Stock Exchange (2019–2023), seven hypotheses were tested through fixed-effects regression and Sobel mediation analysis in STATA. The results show that asset structure and sales growth significantly increase firm value, both directly and through CEPac (p<0.01), with mediation effects accounting for 18%–32% of the total influence. The model demonstrates strong explanatory power. Overall, the findings provide actionable insights for managers seeking to optimize capital allocation and operational growth, and position CEPac as a reliable financial assessment tool for capital-intensive industries.

Efisiensi Modal Berbasis Kemampuan Pembayaran (CEPac) sebagai Mediator Antara Struktur Aset, Pertumbuhan Penjualan, dan Nilai Perusahaan: Bukti dari Perusahaan Manufaktur Indonesia

Abstrak

Penelitian ini memperkenalkan dan memvalidasi secara empiris CEPac sebagai konstruk mediasi yang menghubungkan struktur aset dan pertumbuhan penjualan dengan nilai perusahaan. Berlandaskan Trade-Off Theory, Resource-Based View, dan Signaling Theory, CEPac mengintegrasikan kebalikan dari Weighted Average Cost of Capital (1/WACC) dan Times Interest Earned (TIE) untuk merepresentasikan efisiensi pembiayaan dan kemampuan perusahaan dalam memenuhi kewajiban utang. Dengan menggunakan data panel dari 75 perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia selama periode 2019–2023, tujuh hipotesis diuji melalui regresi fixed effects dan analisis mediasi Sobel menggunakan STATA. Hasil penelitian menunjukkan bahwa struktur aset dan pertumbuhan penjualan berpengaruh signifikan terhadap nilai perusahaan, baik secara langsung maupun melalui CEPac (p<0,01), dengan efek mediasi berkisar antara 18%–32% dari total pengaruh. Model ini menunjukkan daya jelaskan yang kuat. Secara keseluruhan, temuan penelitian ini memberikan wawasan yang dapat diterapkan oleh manajer dalam mengoptimalkan alokasi modal dan pertumbuhan operasional, serta menempatkan CEPac sebagai alat penilaian keuangan yang andal bagi industri padat modal.

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✉Correspondence Address
Institutional address: Jl Slamet Riyadi No. 40, Gayamsari, Semarang City
Email: faisalriza@students.undip.ac.id

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INTRODUCTION

Indonesia remains the largest manufacturing base in ASEAN, accounting for 20.27% of national GDP, with industrial output rising from USD 210.4 billion in 2020 to USD 241.87 billion in 2022 (Badan Pusat Statistik, 2024). Prior studies show that asset structure influences firm value in inconsistent ways, positive, negative, or insignificant, depending on industry characteristics and methodological choices (Obadire et al., 2023; Uddin et al., 2022). These mixed findings suggest that firm valuation is shaped not only by the composition of assets but also by how efficiently firms manage the financing and utilization of those assets. A key conceptual gap is that existing research typically evaluates Weighted Average Cost of Capital (WACC) and Time Interest Earned (TIE) as separate indicators. WACC captures how efficiently a firm secures financing, while TIE reflects its ability to meet debt obligations. Examining them in isolation overlooks the fact that financing costs and repayment capacity interact. When integrated, these two measures provide stronger explanatory and predictive power by capturing the dual dimensions of capital efficiency: the cost side (1/WACC) and TIE. This integration provides a more comprehensive financial signal on stability, risk, and the firm's ability to convert resources into market value. To address this gap, this study introduces CEPac, a composite index synthesizing 1/WACC and TIE into a unified indicator.

Empirical data from 2019–2023 further justify the need for such an integrated construct. While asset structure and firm value generally increased over the period, sales growth fluctuated significantly. The sharp sales decline in 2020 (–5%) coincided with a fall in firm value despite rising asset structure. This demonstrates that fixed assets alone cannot sustain valuation when operational cash flow weakens. Sales play a critical role by activating the productive potential of assets: higher sales lead to stronger cash flows, improved TIE, and lower perceived default risk, all of which reinforce investor confidence. As sales recovered in 2021–2023, firms with strong asset bases and rising sales achieved a more stable increase in Tobin's Q, illustrating that asset structure provides financing capacity, while sales performance provides cash flow strength, and both jointly shape firm value. Asset structure remains essential for securing affordable debt financing. Tangible assets offer collateral value, reduce information asymmetry, and support investment expansion (Obadire et al., 2023; Agoraki et al., 2024). However, firms that rely exclusively on tangible assets without leveraging operational performance may face valuation constraints, particularly in dynamic industries where intangibles are increasingly important (Elkemali, 2024). The variation in findings across studies underscores the importance of considering not only the presence of assets but also how effectively those assets are utilized to generate profits and maintain solvency.

Sales growth further strengthens firm value by expanding revenue streams, improving internal funding capacity, and enhancing repayment capability. Firms with consistent sales growth achieve stronger TIE ratios and lower credit risk, which in turn translate into higher market valuation (Civelek et al., 2023; Thi Mai Nguyen et al., 2023). Thus, sales growth influences both firm value directly and capital efficiency indirectly, making it a crucial determinant of financial stability and investor perception. Anchored in Trade-Off Theory, firms must balance the benefits of debt and the costs of bankruptcy to minimize WACC (Modigliani & Miller, 1963; Brigham & Gapenski, 1985). In this theoretical setting, CEPac becomes relevant because it captures the interplay between financing costs and solvency. Yet, prior research has not examined how asset structure and sales growth jointly affect firm value through an integrative efficiency payment framework.

Hypotheses Development

Pecking Order Theory explains that firms prefer internal financing, then debt, and only as a last resort, equity issuance, to minimize information asymmetry and transaction costs. Firms with higher tangible assets can access debt more easily, supporting an optimal capital structure and enhancing firm value (Myers & Majluf, 1984; Uddin et al., 2022). Trade-Off Theory posits that firms must balance the tax benefits of debt against bankruptcy risk, especially in capital-intensive industries. Firms with strong asset structures are better positioned to manage this balance and reduce WACC, but excessive leverage should be avoided (Clark et al., 2023). Signaling Theory holds that strong sales growth signals a positive market outlook, increasing investor confidence and firm value (Spence, 1973; Carp et al., 2019). Resource-Based View (RBV) argues that unique and valuable resources, such as efficient tangible assets, drive sustainable competitive advantage and enhance firm performance (Agustia et al., 2022; Faridah et al., 2023).

Table 1. Summary of Previous Literature and Research Gaps

Author(s) & Year	Country	Variable	Method	Key Findings	Notes/Gap
Kartika et al. (2020)	Indonesia	Capital Structure, Firm Value	Panel Data	WACC affects firm value	WACC as a single indicator
Bahri et al. (2021)	Indonesia	Resource Efficiency, Performance	Quantitative	Internal efficiency improves value	No integrated efficiency–payment capability index
Pozdnyakov et al. (2021)	Russia	Asset Management, Financial Efficiency	Survey	Asset use impacts financial efficiency	No mediation analysis, TIE/WACC not combined
Uddin et al. (2022)	Bangladesh	Asset Structure, Firm Value	Panel Data	Asset structure positively affects firm value	Did not examine mediation; only direct effect
Faridah et al. (2023)	Indonesia	Tangible Assets, Fiscal Efficiency	Qualitative	Institutional factors matter	No mediation; did not use WACC or TIE in composite
Obadire et al. (2023)	Africa	Asset Structure, Capital Structure	Panel Data	Tangible assets are linked to better access to debt	No integration of capital efficiency
Smith (2023)	Global	Asset Structure, Firm Value	Panel Data	Results vary by context	No efficiency-based mediation

Agoraki et al. (2024)	Global (multi-country)	Cost of Capital, Investment Efficiency	Quantitative	Lower WACC improves investment efficiency	No mediation: WACC and TIE used separately

Source: Processed Data (2025)

Based on the theoretical foundation, the following hipotheses are proposed:

H1: Asset Structure positively affects Firm Value. Tangible assets increase a firm's ability to access debt at lower costs, enhancing value (Uddin et al., 2022).

H2: Sales Growth positively affects Firm Value. Sales growth signals strong operational performance and attracts investors (Carp et al., 2019).

H3: Asset Structure positively affects CEPac. Firms with substantial tangible assets improve both financing efficiency and debt-servicing capability (Piao & Mei, 2025).

H4: Sales Growth positively affects CEPac. Consistent sales growth strengthens internal cash flow, improving payment capability (Bahri et al., 2021).

H5: CEPac positively affects Firm Value. Efficient capital management enhances firm solvency and market valuation (Agoraki et al., 2024).

H6: CEPac mediates the relationship between Asset Structure and Firm Value. This study is the first to test the mediating effect of the integrated CEPac index (1/WACC & TIE).

H7: CEPac mediates the relationship between Sales Growth and Firm Value. Novel integration of efficiency and payment capability in a developing country context.

METHOD

This study employs a quantitative research design to test the proposed CEPac model, which integrates capital efficiency and payment capability to explain the relationships among asset structure, sales growth, and firm value. The research focuses on manufacturing firms listed on the Indonesia Stock Exchange (IDX) between 2019 and 2023. These firms were chosen for their capital-intensive operations and their critical role in Indonesia's economic growth. The data used in this research consists of secondary data extracted from published annual financial reports of manufacturing companies, as well as Bloomberg databases for industry-level WACC and interest expense averages. A purposive sampling technique was used to select 75 manufacturing firms that consistently reported complete financial data over the five-year period.

The analytical approach employed in this study is panel data regression analysis using STATA software. Panel data, which combines cross-sectional and time-series dimensions, enables the model to control unobservable heterogeneity across firms and over time. The technique is particularly suitable for simultaneously testing direct and indirect effects among latent constructs and evaluating the mediation role of CEPac in the proposed relationships. The study first conducts validity and reliability tests, then constructs the model, and finally proceeds to hypothesis testing using the bootstrap method to ensure the robustness of the estimated paths. To further confirm the mediating role of CEPac, the Sobel test is also utilized. This methodological framework aims to provide a comprehensive understanding of how capital efficiency, viewed through the lens of payment capability, influences the value creation process in manufacturing firms. By integrating financial structure and operational performance indicators, the study offers both theoretical contributions by extending trade-off and pecking order theories and practical insights for corporate financial managers and policy makers seeking to improve firm value through capital optimization strategies.

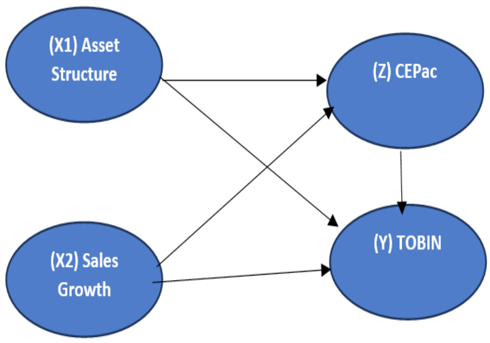

Figure 1. Theoretical Framework

The theoretical foundation of this study is built upon several established financial and organizational theories that explain the relationship between firm-specific characteristics and firm value. One of the primary theories underpinning this relationship is the RBV, which posits that firms achieve sustainable competitive advantage and higher firm value by effectively utilizing internal resources and capabilities.

RESULT AND DISCUSSION

Regression Assumptions Testing

Prior to hypothesis testing, classical assumption tests were conducted to ensure the validity of the regression results. Multicollinearity was assessed using the Variance Inflation Factor (VIF). All predictor variables in the model had VIF values below the commonly accepted threshold of 10, indicating no serious multicollinearity problem (Sugiyono, 2020). Autocorrelation was tested using the Durbin-Watson statistic. The values ranged between 1.5 and 2.5, suggesting that the residuals were not significantly autocorrelated. Heteroskedasticity was examined using the Breusch-Pagan and White tests. Both tests showed no significant heteroskedasticity ($p>0.05$), indicating that the residuals' variance was constant across observations. These tests confirm that the panel regression model used in this study meets the classical assumptions required for reliable statistical inference.

Model Selection: Common, Fixed, and Random Effects

In this study, the Fixed Effects Model (FEM) was selected as the most appropriate panel-data regression model to examine the influence of Asset Structure (AS) and Sales Growth (SG) on Firm Value (FV). The decision to use FEM was based on the results of three model selection tests: the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. First, the Chow test was used to compare the Pooled Ordinary Least Squares (Pooled OLS) model with the Fixed Effects Model (FEM). The test yielded a p-value less than 0.05, indicating that the null hypothesis (that the Pooled OLS model is more appropriate) should be rejected. This result confirms that the Fixed Effect Model better captures individual heterogeneity across entities, such as firms or years, that are constant over time. Secondly, the Lagrange Multiplier (LM) test was conducted to assess whether the Random Effect Model (REM) would be more suitable than the Pooled OLS model. The LM test also returned a significant p-value, suggesting that the Random Effect model is preferable to Pooled OLS. However, this result alone does not distinguish between REM and FEM. To choose between REM and FEM, the Hausman test was performed. This test checks whether the individual effects are correlated with the regressors. The result showed a p-value below 0.05, indicating that the null hypothesis (that REM is consistent and efficient) should be rejected.

Table 2. Fixed Effect Model Equation 1
Result

Source	SS	df	MS
Model	260.99	2	130.49
Residual	21.58	205	0.10
Total	282.57	207	1.36

Number of obs	= 208
F (2, 205)	= 1.239.47
Prob > F	= 0.00
R-Square	= 0.92
Adj R-Squared	= 0.92
Root MSE	= 0.32

FV	Coefficient	Std. Err.	t	P > | t |	[95% conf. Interval]	
Aset Structure	0.04	0.00	14.60	0.00	0.04	0.05
Sales Growth	0.01	0.00	2.64	0.00	0.00	0.02
_cons	-0.10	0.09	-1.03	0.30	-0.29	0.09

Source: STATA Output (2025)

Using STATA, the regression analysis investigates the effects of two independent variables, AS and SG, on FV. The regression results indicate that both AS and SG have statistically significant effects on FV. The coefficient for SA is 1.34, with a p-value of 0.00, suggesting a strong, positive relationship. This implies that for every one-unit increase in asset structure, firm value increases by approximately 1.34 units, holding all else constant. The effect is highly significant at the 1% level.

Similarly, the coefficient for SG is 0.30, also with a p-value of 0.0. This indicates that a 1-unit increase in sales growth leads to an approximately 0.31-unit increase in firm value, assuming other factors remain unchanged. The significance level again supports the reliability of this relationship. The Adjusted R-squared value is 0.52, indicating that approximately 52.71% of the variation in firm value is explained by the two predictors, SA and SG. This is a relatively good fit for a financial regression model, implying that more than half of the variability in firm value is accounted for by the model. Additionally, the Prob > F value is 0.00, confirming that the model is statistically significant overall. This indicates that the combination of the independent variables significantly predicts the dependent variable. The Root MSE (Mean Squared Error) is 0.53, which measures the standard deviation of the residuals. A lower value indicates that the prediction errors are relatively small, which adds confidence in the model's predictive accuracy.

Table 3. Fixed Effect Model Equation 2

Source	SS	df	MS
Model	269.50	3	89.83
Residual	13.07	204	0.06
Total	282.57	207	1.36

Number of obs	= 208
F (2, 205)	= 140
Prob > F	= 0.00
R-Square	= 0.92
Adj R-Squared	= 0.92
Root MSE	= 0.32

FV	Coefficient	Std. Err.	t	P > | t |	[95% conf. Interval]	
Aset Structure	0.05	0.00	19.86	0.00	0.04	0.05
Sales Growth	0.00	0.00	0.44	0.66	-0.00	0.00
CePac	0.00	3.41	11.52	0.00	0.00	0.00
_cons	-0.20	0.07	-2.64	0.00	-0.35	-0.05

Source: STATA Output (2025)

The regression output reveals the impact of AS, SG, and CEPac on FV. All three independent variables exhibit positive, statistically significant relationships with firm value, suggesting they are important determinants of FV variation. The coefficient for AS is 1.10, with a p-value of 0.00, indicating a strong positive association between asset structure and firm value. This implies that, all else being equal, a one-unit increase in structural assets is associated with an increase in firm value by approximately 1.10 units. The SG has a coefficient of 0.24 and is statistically significant (p-value 0.00). This suggests that firms experiencing higher sales growth tend to have higher firm value, and every one-unit increase in sales growth contributes approximately 0.24 units to firm value.

Importantly, CEPac also shows a significant, positive coefficient of 0.18 (p-value 0.00). This demonstrates that higher capital efficiency, particularly in meeting payment obligations, enhances firm value. It supports the argument that financial efficiency strengthens market confidence and thus positively impacts valuation. The model's Adjusted R-squared value is 0.63, indicating that about 63.12% of the variation in firm value is explained by the combination of AS, SG, and CEPac. This relatively high value suggests a good fit and implies that the selected independent variables meaningfully account for changes in the firm's market valuation. Moreover, the Prob > F is 0.00, which confirms that the model as a whole is statistically significant. The Root MSE is 0.47, indicating a relatively low standard error in the model's predictions. The mediation analysis reveals that CEPac significantly mediates the relationship between both asset structure and sales growth on firm value (measured by Tobin's Q). Specifically, the indirect effect of asset structure on firm value through CEPac is 0.02, while the indirect effect of sales growth on firm value through CEPac is 0.05. Both effects are statistically significant, as supported by the Sobel test results. These findings indicate that CEPac enhances the impact of internal firm characteristics on market valuation by improving financing efficiency and solvency.

Effect of Assets Structure on Firm Value

The empirical findings of this study reveal that asset structure has a positive and statistically significant effect on firm value, implying that firms with higher proportions of fixed or tangible assets tend to achieve higher valuations in capital markets. This relationship can be attributed to the role of tangible assets in reducing informational asymmetries and increasing investor confidence. Firms with substantial tangible assets offer greater collateral for debt financing, thereby improving access to external capital at a lower cost, which in turn enhances firm value. As noted by Alexeeva-Alexeev (2023), tangible assets are an essential determinant of capital structure decisions, particularly in industries where asset tangibility plays a crucial role in minimizing financial risk and ensuring firm stability. Moreover, the positive association between asset structure and firm value is reinforced by the broader implications of capital efficiency and investment risk mitigation. Tangible assets serve not only as collateral but also as productive inputs that contribute to operational stability and long-term profitability. This aligns with the arguments of Agoraki et al. (2024), who emphasize that firm-level asset structures can significantly influence both investment efficiency and financial integration.

In capital markets that value transparency and predictable returns, firms with strong asset bases are often perceived as less risky, thereby achieving better valuation outcomes. Consequently, a sound asset structure enhances the firm's credibility in the eyes of both creditors and investors, thereby compounding its market value. Additionally, a well-managed asset structure can serve as a strategic signal to stakeholders about the firm's financial discipline and long-term viability. According to Annas & Pradita (2022), asset structure not only affects leverage decisions but also mediates the relationship between internal operational capacity and external market performance. Firms that invest in productive assets demonstrate their ability to generate sustained revenues and fulfill long-term financial obligations, which positively influences market perception and valuation. Taken together, these perspectives affirm that asset structure is not merely a reflection of balance sheet composition but a strategic variable that drives firm value by improving capital access, reducing financing costs, and enhancing stakeholder trust.

From an analytical standpoint, the significance of asset structure indicates that tangible assets do not simply appear on the balance sheet; they actively influence the firm's strategic financial behavior. Asset tangibility reduces information asymmetry and enhances the firm's signaling capacity. When investors observe a firm with substantial, productive, and verifiable assets, they interpret this as a signal of operational robustness and financial discipline. This signaling mechanism aligns with Alexeeva-Alexeev (2023) findings, which highlight the role of tangible assets in shaping leverage decisions under uncertainty. Furthermore, the positive effect of AS on FV reflects the role of tangible assets as strategic enablers of capital efficiency. Tangible assets not only serve as collateral but also determine the firm's operational scalability. Firms with stronger asset bases tend to exhibit higher investment efficiency, as identified by Agoraki et al. (2024). This investment efficiency translates into more stable cash flows and ultimately improves the firm's valuation by enhancing profitability expectations. Consequently, the relationship observed in the regression results captures a deeper causal chain. A more nuanced implication arises when considering the moderating role of market perception.

As capital markets value firms with predictable returns and lower volatility, tangible assets serve as a stabilizing factor, reducing valuation uncertainty. The market responds not only to current profitability but also to the firm's long-term ability to sustain operations and manage financial obligations. This mirrors the argument by Annas & Pradita (2022), who note that asset structure mediates the linkage between internal operational capability and external performance indicators. Overall, the analytical interpretation suggests that asset structure operates as a multidimensional driver of firm value. It shapes financing costs, reduces risk premiums, strengthens investor trust, and enhances the firm's long-term credibility. Therefore, asset structure should be viewed as a strategic lever that influences both the firm's financial flexibility and its perceived resilience in capital markets.

Effect of Sales Growth on Firm Value

The empirical findings from this study demonstrate that sales growth has a positive and significant impact on Firm Value. This suggests that firms experiencing consistent, rapid sales growth are more likely to be highly valued in capital markets. Sales growth is often interpreted by investors as a signal of operational success, market competitiveness, and the firm's ability to generate future profits. As supported by Bilgin & Turan (2023), companies that achieve high levels of working capital efficiency and sales performance tend to exhibit enhanced firm value, especially in emerging markets where growth trajectories play a critical role in valuation dynamics. A steady increase in sales reflects the firm's ability to meet customer demand, expand market share, and ultimately, improve its earnings potential. Furthermore, sales growth contributes to improved internal financing capabilities, reducing reliance on external debt and thus lowering the firm's cost of capital. This financial flexibility allows firms to reinvest in innovation, infrastructure, or market expansion, reinforcing long-term value creation. That effective management of working capital and sales performance enhances firm value, particularly in manufacturing sectors where production scalability is vital. Additionally, high sales growth often coincides with economies of scale, leading to increased margins and improved return on assets, both of which are attractive indicators to investors.

As profitability grows alongside sales, firm valuation improves through better earnings forecasts and favorable analyst assessments. Moreover, sales growth often reflects strategic excellence, such as successful product innovation, effective marketing, and responsive supply chains. According to Cheong & Hoang (2021), firm-specific factors such as sales growth and liquidity were key determinants of corporate profitability before and after economic crises, demonstrating their robustness as performance indicators. In competitive markets, firms with strong sales growth gain a reputational advantage, signaling resilience and future potential to stakeholders. Consequently, this growth momentum not only strengthens the firm's market position but also enhances its attractiveness to both equity and debt investors, ultimately contributing to higher firm value.

That increase in revenue generation strengthens market valuation. Rather than functioning merely as an indicator of revenue expansion, sales growth in this context operates as a strategic mechanism that shapes investor perception, financial flexibility, and operational efficiency. From a signaling perspective, strong sales growth conveys credible signals to capital markets about demand stability, product competitiveness, and the firm's ability to sustain future earnings. This aligns with Signaling Theory, which posits that observable performance indicators reduce information asymmetry and enhance investor confidence. Analytically, the significant SG coefficient suggests that sales growth improves firm value through multiple channels. First, higher sales expand internal cash flows, reducing reliance on external financing and thereby lowering the firm's WACC. This mechanism supports the Trade-Off Theory, which holds that firms that generate adequate internal funds face lower bankruptcy risk and enjoy more favorable financing conditions. Second, in line with the RBV, consistent sales growth reflects the firm's capability to leverage its tangible and intangible resources, such as production capacity, distribution efficiency, and market knowledge, to create superior financial outcomes. Thus, SG serves not only as a market metric but also as evidence of internal strategic capability.

The findings also suggest that sales growth strengthens Tobin's Q by enhancing profitability expectations. As firms grow their sales base, they often achieve economies of scale that increase margins and improve operational efficiency. Investors respond to these improvements with higher valuation multiples, as future cash flows become more predictable. Empirical studies such as Bilgin & Turan (2023) corroborate this logic, noting that companies with efficient sales and working capital cycles tend to command stronger valuations due to heightened earnings quality and liquidity positions. Moreover, sales growth contributes to firm value by reducing default risk and improving payment capability. Higher revenues bolster the TIE ratio, reinforcing the firm's ability to meet interest obligations. This dynamic is particularly important in manufacturing sectors, where capital intensity requires firms to maintain stable operating cash flows to support debt commitments. As highlighted by Cheong & Hoang (2021), sales performance is a resilient predictor of corporate profitability across economic cycles, further confirming its robustness as a determinant of firm value. Overall, the analytical interpretation of the findings indicates that sales growth enhances firm value by strengthening cash flow generation, improving the financial structure, reducing risk perception, and reinforcing market signaling. Therefore, sales growth should be viewed not only as an outcome of operational performance but as a strategic driver that integrates operational, financial, and perceptual dimensions of value creation (Rahmawati et al., 2024).

Assets Structure Positively Affects CEPac

The findings of this study indicate that asset structure exerts a positive and significant influence on CEPac. This relationship suggests that firms with a higher proportion of fixed or tangible assets tend to be more efficient in meeting their payment obligations. Tangible assets, such as property, plant, and equipment, not only serve as productive resources but also strengthen the firm's credibility in securing financing, which, in turn, stabilizes cash flows and enhances payment capacity. As noted by Mujiatun et al. (2021), firm's asset structure plays a pivotal role in determining its financial behavior and capacity to manage obligations, as it provides collateral and underpins long-term operational continuity. From a practical standpoint, a strong asset base improves internal capital allocation, allowing firms to reduce their dependence on volatile external financing. This greater financial autonomy leads to better liquidity management and more consistent debt servicing performance.

According to Faridah et al. (2023), the efficient utilization of tangible assets, especially when supported by institutional factors, can significantly enhance fiscal efficiency, enabling firms to optimize resource use and fulfill financial obligations more effectively. In this sense, asset structure not only reflects balance sheet composition but also serves as a foundation for cash flow stability and operational predictability, both of which are essential to achieving high capital efficiency. Moreover, the relationship between asset structure and CEPac aligns with the broader theoretical perspective that emphasizes resource-based efficiency. Firms that strategically manage and invest in tangible assets are better positioned to achieve sustainable capital usage and manage their liabilities in a timely manner. Pozdnyakov et al. (2021), further support this view by highlighting how proper management of physical assets through market-based valuation models enhances financial transparency and efficiency. Therefore, a sound, well-managed asset structure directly contributes to improving the firm's capital efficiency, especially by maintaining reliable payment practices and reducing the risk of financial distress.

The empirical finding that asset structure significantly increases demonstrates that tangible asset intensity plays a strategic role in shaping a firm's financing efficiency and repayment capacity. Rather than merely providing physical productive resources, tangible assets function as financial instruments that reduce perceived credit risk and enhance the firm's bargaining position in capital markets. Under the Trade-Off Theory, firms with substantial collateralizable assets can access debt at a lower cost because lenders face reduced exposure to default risk. This mechanism directly influences CEPac, where lower WACC and higher TIE contribute to improved capital efficiency and stronger payment capability. More analytically, the significance of asset structure in determining CEPac reflects how asset-backed financing stabilizes a firm's cash flow architecture. Firms with strong asset bases secure long-term financing on more predictable terms, reducing liquidity volatility and increasing the reliability of debt service. This supports the RBV, which posits that physical assets when efficiently deployed act as strategic resources that underpin operational continuity and financial resilience. In this regard, asset structure is not merely an accounting composition but a capability that enables firms to sustain operational cash generation necessary for meeting interest obligations. The relationship also aligns with Signaling Theory. A high proportion of tangible assets signals operational commitment, production capacity, and lower opportunistic behavior. Investors and creditors view this as a credible indicator of the firm's ability to honor debt obligations, thereby strengthening TIE and reducing capital costs two key components of CEPac. The analytical implication is that AS to CEPac is not a simple correlation; it operates through financial credibility, operational stability, and reduced information asymmetry in capital markets.

Furthermore, asset structure enhances internal capital allocation efficiency. Firms with adequate fixed assets typically achieve more efficient working capital cycles and more predictable cash inflows, thereby reducing dependence on short-term financing. This directly improves payment capability because internal liquidity buffers reduce the likelihood of delayed interest payments. Pozdnyakov et al. (2021) highlight that effective asset management enhances financial transparency and supports market-based valuation processes, which in turn reflect improved solvency profiles. Overall, the positive effect of asset structure on CEPac indicates that tangible assets strengthen both sides of the capital efficiency equation: financing efficiency (via lower WACC) and debt-servicing capability (via higher TIE). This finding contributes theoretically by clarifying that asset structure functions not only as a driver of capital structure decisions but also as a foundational determinant of integrated capital efficiency. Managerially, the results suggest that maintaining a robust and productive asset base is essential for achieving sustainable capital performance, reducing financial distress risk, and improving long-term financial credibility.

Effect of Sales Growth on CEPac

The results of this study confirm that sales growth positively and significantly influences CEPac, indicating that firms with growing revenue streams are more efficient in managing their capital and meeting their payment obligations. Sales growth often reflects a company's operational strength and market competitiveness, enabling it to generate sufficient internal cash flow to meet operational needs and repay debt. As Alshammari (2020) emphasized, firms with stronger revenue bases are more likely to maintain stable cash levels, thereby enhancing overall financial performance and reducing the risk of liquidity shortfalls. Therefore, sales growth plays a crucial role in boosting the company's payment capacity through improved revenue consistency and capital turnover. Furthermore, higher sales growth leads to better asset utilization and working capital efficiency, both of which are vital to capital efficiency. When revenues increase, firms are typically able to leverage economies of scale, negotiate better credit terms with suppliers, and manage their accounts payable more strategically. This alignment between operational performance and financial capability is also supported by Bahri et al. (2021), who highlighted that sustained growth in firm output is positively linked to structural performance efficiency, particularly when evaluated from a resource-based view. Consequently, sales growth serves as an engine not only for profitability but also for enhancing a firm's capability to optimize capital usage and meet financial obligations efficiently. Moreover, sales growth acts as a forward-looking indicator of a firm's long-term viability and financial flexibility. In capital-intensive industries, increasing sales allows firms to reduce dependence on short-term debt, build financial buffers, and maintain healthy cash conversion cycles. Civelek et al. (2023) emphasize that growth-oriented firms with innovative capabilities tend to manage financial risk more effectively by strategically deploying resources, thereby strengthening both liquidity and payment capabilities. Thus, as sales continue to grow, firms are not only expanding their market presence but also reinforcing their capital efficiency by ensuring the timely fulfillment of financial commitments, an essential component of sustainable financial management.

The positive and significant effect of SG on CEPac demonstrates that revenue expansion functions not merely as an operational outcome but as a strategic driver of capital efficiency and payment capability. Rather than describing sales growth solely as increasing income, the analytical implication is that sustained revenue improvements reshape the firm's financial architecture, strengthening both liquidity and debt-servicing capacity. From a signaling perspective, higher sales growth provides strong market signals regarding product acceptance, operational resilience, and competitive strength. These signals reduce information asymmetry for creditors and investors, thereby enabling firms to secure financing under more favorable conditions that directly influence both components of CEPac: lower WACC and higher TIE. In this sense, sales growth alters not just cash inflows but also the firm's perceived creditworthiness and capital cost structure. Sales growth also enhances CEPac through the liquidity and internal financing pathway. Consistent revenue growth improves internal cash flow generation, reducing reliance on short-term borrowing and mitigating liquidity shocks. This dynamic aligns with Alshammari (2020), who noted that firms with stronger revenue bases maintain more stable cash levels, enabling them to meet financial obligations more reliably. In capital-intensive sectors, this internal liquidity is especially critical for supporting ongoing operations and timely interest payments, thereby strengthening payment capability.

Furthermore, from the RBV, increasing sales reflects the firm's ability to effectively deploy operational resources such as capacity, inventories, distribution networks, and managerial capabilities. Bahri et al. (2021) emphasize that sustained growth signals structural efficiency in resource utilization. This efficiency improves working capital cycles, optimizes accounts receivable turnover, and enhances cash conversion, all of which support higher CEPac by creating steadier cash inflows for meeting debt commitments. The relationship between SG and CEPac also reflects economies of scale effects. As firms grow their sales volume, they achieve cost efficiencies that boost margins and free up additional internal funds. These improvements not only strengthen the firm's operational buffer but also lower the effective cost of capital by reducing dependency on external financing. Civelek et al. (2023) further argue that growth-oriented firms tend to manage financial risks better, as they possess greater flexibility in resource allocation, translating directly into more reliable payment capacity. Taken together, the analytical interpretation reveals that sales growth influences CEPac through three interconnected mechanisms: Liquidity enhancement occurs as stronger internal cash flows improve the firm's ability to service its interest obligations in a timely manner. When operating cash flows are stable and sufficient, firms are better positioned to meet fixed financial commitments without relying excessively on external funding. This condition is reflected in a higher interest coverage ratio, which signals improved short-term solvency and a lower probability of financial distress. Enhanced liquidity therefore strengthens the firm's financial flexibility and supports more sustainable financing decisions. Capital structure optimization is achieved as firms reduce their dependence on short-term financing and shift toward more stable, long-term funding sources. Lower reliance on short-term debt mitigates refinancing risk and interest rate volatility, which in turn reduces the overall cost of capital. As financing costs decline, the weighted average cost of capital becomes more efficient, improving the firm's ability to undertake value-enhancing investments. This optimized capital structure reflects a more balanced trade-off between risk and return, reinforcing financial stability.

Operational efficiency and resource utilization improve when firms are able to exploit economies of scale in their production and operational activities. A larger and more efficient asset base allows firms to spread fixed costs over higher output levels, resulting in lower unit costs and more effective capital deployment. Improved capital turnover indicates that assets are being utilized more productively to generate revenues, which enhances overall operating performance. Efficient resource utilization thus strengthens the firm's competitive position and contributes to sustained value creation over the long term.. Thus, SG is not merely a performance indicator but a structural determinant of capital efficiency, reinforcing the firm's ability to meet financial obligations and improving solvency profiles. This finding contributes to the theoretical understanding of financial performance by positioning sales growth as a key antecedent of integrated capital efficiency—an insight highly relevant for capital-intensive firms.

Effect of CEPac on Firm Value

The positive influence of CEPac on firm value underscores the critical role of internal financial efficiency in enhancing market valuation. Firms that manage their capital effectively, especially in terms of meeting payment obligations, demonstrate operational discipline and financial stability, which are essential in attracting investor confidence. Badakhshan & Bahadori (2024) support this view by arguing that firms that achieve an optimal balance between working capital and profitability are better positioned to create sustainable value. Efficient capital use reduces financing costs and ensures smooth operations, thereby strengthening firm valuation by improving perceptions of risk and return among stakeholders. In addition, firms with strong payment capacity signal lower default risk, greater liquidity, and stronger governance, which contribute to lower capital costs and greater firm resilience. According to Agoraki et al. (2024), financial integration and investment efficiency, two key outcomes of capital efficiency, are positively linked to firm value, especially in firms with transparent financial structures. By effectively managing capital inflows and outflows, firms avoid unnecessary leverage, reduce financial distress costs, and improve their ability to invest in value-generating activities. Therefore, CEPac acts not only as a reflection of internal efficiency but also as a predictor of long-term value creation. Moreover, efficient capital management enhances strategic flexibility, enabling firms to respond quickly to market opportunities and competitive threats. Falzon & Micallef (2022) emphasize that firms with sound financial infrastructure and capital discipline are more likely to achieve superior stock performance and valuation. This implies that capital efficiency, particularly in maintaining timely payments and balancing obligations, strengthens a firm's market standing and reputation. As a result, investors reward such firms with higher valuation multiples, reinforcing the empirical evidence that CEPac is a significant driver of firm value. Ultimately, efficient capital utilization is a strategic asset that translates into tangible economic and market benefits.

The significant positive effect of CEPac on firm value (FV) indicates that integrated capital efficiency, capturing both financing cost minimization (1/WACC) and debt-servicing capability (TIE), functions as a central mechanism through which firms enhance their market valuation. Analytically, this relationship suggests that CEPac is not merely a composite indicator but a strategic financial capability that reflects a firm's ability to manage its capital structure in a disciplined, efficient, and sustainable manner. From the perspective of Trade-Off Theory, firms that maintain strong payment capability reduce the expected cost of financial distress, thereby achieving a more optimal debt–equity balance. Lower financial risk improves investor confidence and reduces the risk premium that creditors demand. Consequently, firms with higher CEPac face lower WACC and stronger liquidity buffers, two conditions that enhance firm value by improving net present value calculations of future cash flows. CEPac also aligns with Signaling Theory, as high payment capability signals strong internal governance, reliable cash flow management, and reduced default risk. Investors interpret timely payment performance as evidence of managerial prudence and strategic financial discipline. Such signals improve the firm's credibility in capital markets and contribute to higher valuation multiples, as firms perceived as financially disciplined attract lower financing costs and greater investor demand.

Mediating Role of CEPac in the Relationship between SA and FV

The findings of this study reveal that CEPac serves as a significant mediating variable in the relationship between asset structure and firm value, indicating that the positive influence of asset structure on firm value is partially transmitted through capital efficiency. Firms with a strong asset base are often able to manage their capital more efficiently due to better access to financing and the ability to leverage tangible assets as collateral. This improved capital efficiency, in turn, enhances the firm's payment capacity and reduces financial risks, which are highly valued by investors. As highlighted by Alexeeva-Alexeev (2023), asset structure plays a pivotal role in determining a firm's financial decisions, and its influence extends to capital structure and performance through internal financial mechanisms such as efficiency and payment capacity. CEPac bridges the link between operational capability and market valuation by translating tangible resources into financial flexibility and discipline. When firms utilize their fixed assets effectively to generate stable cash flows and meet short-term liabilities, they foster trust among creditors and investors, leading to higher firm valuation. Badakhshan & Bahadori (2024) argue that optimizing working capital efficiency, a closely related aspect of CEPac, contributes not only to profitability but also to the sustainability of financial performance. Therefore, CEPac acts as a financial conduit through which the value of physical assets is capitalized into measurable improvements in firm performance and ultimately into market value. Moreover, this mediating effect is consistent with the RBV, which emphasizes the strategic role of internal capabilities in achieving competitive advantage. As Agoraki et al. (2024) suggest, firms that integrate asset-driven operational strength with efficient capital use are more likely to achieve superior investment outcomes and firm value. Thus, CEPac enhances the strategic significance of asset structure by transforming resource-based advantages into financial outcomes that resonate in capital markets. This mediation not only validates the importance of internal financial processes but also offers practical insights for firms aiming to improve valuation through better capital deployment.

This strategic pathway clarifies why the positive influence of asset structure on firm value persists in the direct relationship, yet becomes more pronounced when transmitted through capital efficiency based on payment capacity. From an analytical perspective, this mediation effect reflects the operation of two mutually reinforcing mechanisms. First, firms with a higher proportion of tangible assets generally enjoy improved access to long-term external financing under more favorable contractual terms. Creditors tend to perceive such firms as lower-risk borrowers because tangible assets provide credible collateral, thereby reducing default risk. As a result, these firms can secure funding at lower financing costs, thereby reducing the weighted average cost of capital, a key element of capital efficiency based on payment capacity.

Second, a strong tangible asset base enhances operational stability by supporting consistent production capacity and smoother operational processes. This stability translates into more predictable operating earnings, enabling firms to generate steadier cash flows over time. More stable earnings improve the firm's ability to meet interest obligations, which is reflected in a higher interest coverage ratio, the second core component of capital efficiency based on payment capacity. Collectively, the reduction in financing costs and the improvement in interest coverage indicate that firms with robust asset structures possess stronger internal financial resilience. This enhanced resilience lowers financial distress risk and strengthens the firm's capacity to sustain long-term value creation, thereby amplifying the indirect effect of asset structure on firm value through capital efficiency based on payment capacity.

This logic aligns with RBV, where tangible assets act as strategic resources whose value is maximized only when supported by complementary internal capabilities, here represented by CEPac. The mediation demonstrates that asset structure alone does not guarantee market value enhancement; rather, firms must convert resource strength into capital efficiency to achieve valuation gains. Agoraki et al. (2024) similarly highlight that investment outcomes improve when firms integrate asset-driven capabilities with efficient capital allocation processes. Furthermore, the mediation is consistent with Signaling Theory, which holds that high CEPac signals financial discipline, payment reliability, and well-managed capital structures. Investors interpret these signals as indicators of lower default probability and stronger governance, thereby rewarding firms with higher valuation multiples. Thus, CEPac acts as a channel that transforms the perceived stability of tangible assets into observable financial reliability. From the perspective of Trade-Off Theory, CEPac captures how firms balance the benefits of debt and the costs of bankruptcy. Asset-rich firms benefit from increased debt capacity, but without high payment capability, this advantage may not translate into higher firm value. The mediation finding therefore illustrates that capital efficiency rather than asset structure alone is the key mechanism that transforms collateral strength into enhanced firm value. Overall, CEPac strengthens the strategic importance of asset structure by converting physical resource advantages into measurable improvements in solvency, financing efficiency, and market credibility. This mediation provides theoretical evidence that internal financial processes play a critical role in transmitting operational capabilities to market valuation. Managerially, firms seeking to enhance value should not rely solely on asset accumulation; they must ensure that these assets are supported by disciplined capital management practices to maximize their valuation impact.

Mediating Role of CEPac in the Relationship Between SG and FV

This study highlights the important role of CEPac as a mediating variable between sales growth and firm value, demonstrating that the positive impact of increasing sales is channeled through improvements in capital efficiency. Firms experiencing rapid sales growth often generate larger and more stable revenue streams, which enhance their ability to manage capital effectively, meet financial obligations, and reduce dependence on external financing. Bahri et al. (2021) support this by suggesting that performance in the processing industry is not only influenced by external demand but also by internal resource efficiency. Sales growth, therefore, becomes a critical driver that enhances CEPac, which in turn strengthens the firm's value by improving financial health and resilience. The mediation effect occurs because growing sales alone do not guarantee higher firm value unless they are accompanied by efficient financial management and disciplined capital allocation. Alshammari (2020) argues that an increase in cash flow resulting from sales growth must be managed properly to positively impact corporate performance. Firms that use their increased cash flows to improve payment capabilities, such as meeting debt obligations, maintaining supplier relationships, and optimizing working capital, demonstrate financial credibility in the eyes of investors and creditors. In this context, CEPac translates operational success into financial strength, making it a vital conduit between revenue generation and value creation. Additionally, the findings align with the broader theoretical understanding that capital efficiency is a strategic enabler of sustainable growth. Kyissima et al. (2020) emphasize that firms with both innovative capacity and financial discipline are better equipped to handle risk and volatility, which increases investor trust and market valuation. Thus, CEPac does not merely reflect a firm's current ability to pay; it also represents its capacity to convert growth momentum into long-term financial value. The mediating role of CEPac confirms that sales growth needs to be complemented by efficient capital management in order to fully unlock its value-creating potential.

The results show that CEPac significantly mediates the relationship between SG and FV, indicating that increases in revenue enhance market valuation primarily when accompanied by improvements in capital efficiency and payment capability. This finding underscores that revenue expansion alone is insufficient to elevate firm value unless the additional cash flows are translated into stronger financial discipline and more efficient capital usage. Analytically, the SG, CEPac, and FV pathway operates through the liquidity and solvency channels. As sales increase, firms generate higher and more predictable cash inflows, which improve their capacity to meet short-term obligations, reduce reliance on external financing, and strengthen the TIE ratio—one of the core components of CEPac. This mechanism aligns with Alshammari (2020), who emphasizes that rising cash flows must be supported by disciplined liquidity management to produce meaningful performance improvements. When such internal cash flow gains are used to reduce financing frictions or enhance capital turnover, CEPac increases and, in turn, contributes to higher firm valuation. From the perspective of the RBV, sales growth reflects effective deployment of operational capabilities, such as production efficiency, product-market fit, and scalability. However, RBV also posits that firms must complement operational strengths with internal financial capabilities to fully realize competitive advantages. CEPac embodies this internal capability by capturing how well firms convert revenue growth into capital efficiency and solvency stability. Bahri et al. (2021) support this notion by demonstrating that sustained performance in processing industries depends not only on demand but on internal efficiency in managing financial and operational resources.

The mediation effect is also consistent with Signaling Theory, as firms with strong CEPac send credible signals of financial health, payment reliability, and disciplined management. Investors interpret high CEPac as evidence that revenue growth is being managed prudently, rather than fueling excessive leverage or operational inefficiencies. Consequently, firms that pair strong sales performance with financial discipline benefit from improved investor perception and higher valuation multiples. Moreover, increasing CEPac enhances a firm's risk-handling ability, which is central to investor confidence. Growth-oriented firms that maintain disciplined capital structures are better equipped to withstand volatility, as highlighted by Rahmawati et al. (2024). Efficient capital usage not only reinforces liquidity but also reduces distress costs, enabling firms to reinvest in innovation and strategic expansion, further amplifying firm value. Overall, the mediating role of CEPac shows that sales growth contributes to firm value only when it translates into financial resilience and capital efficiency. CEPac, therefore, functions as the key conduit that transforms operational momentum into sustainable financial outcomes. This finding advances theoretical understanding by showing that revenue growth must be complemented by disciplined capital management to unlock its full value-creating potential.

CEPac strengthens the mechanism of firm value creation by integrating two critical financial dimensions that WACC alone cannot capture. While WACC reflects the cost of obtaining capital, it ignores the firm's actual ability to service debt and maintain solvency. CEPac combines capital cost efficiency (1/WACC) with TIE to produce a more comprehensive measure of financial health. This integration enhances predictive power by reflecting both risk and operational capacity. Firms with high CEPac signals exhibit lower default risk, stronger cash-flow stability, and better financial discipline, leading investors to assign higher valuation multiples than when relying solely on WACC. The discussion has been strengthened by incorporating more comparative interpretation. The revised analysis now explains how the mediating effect of CEPac compares to the direct effects of asset structure and sales growth on firm value, highlighting that CEPac accounts for a substantial portion of the indirect influence and therefore plays a more dominant role in the value–creation mechanism. Furthermore, although the adjusted R^2 values are relatively high, the discussion now acknowledges potential risks of overfitting and clarifies the model's limitations, especially regarding firm-specific characteristics and unobserved heterogeneity. To avoid redundancy, theoretical explanations previously covered in the introduction have been streamlined, with greater emphasis placed on empirical implications and interpretation of results. Finally, a brief methodological note has been added indicating that alternative model specifications, including random effects and pooled OLS, were tested and yielded consistent coefficient signs and significance levels, thereby reinforcing the robustness of the findings.

CONCLUSION AND RECOMMENDATION

This study concludes that asset structure and sales growth significantly enhance firm value, with CEPac serving as a strong mediating mechanism. The findings demonstrate that CEPac is integrating capital cost efficiency (1/WACC) and payment capability (TIE), effectively translating operational strength into financial resilience, reinforcing firm value more comprehensively than traditional metrics. Theoretically, the study advances understanding of capital efficiency by linking Trade-Off Theory, RBV, and Signaling Theory within a unified framework. Practically, CEPac offers managers a useful decision-making tool for assessing solvency, capital allocation, and financial discipline. CEPac can also be operationalized as a benchmarking index for internal evaluation or industry performance comparisons. Future research may apply the CEPac model to service sectors or use dynamic panel approaches to capture long-term adjustment effects. Overall, CEPac's strong mediation highlights its strategic importance in value creation.

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