

The Effect of Asset Growth, Sales Growth, and Firm Size on Capital Structure (DER) at PT Hutama Karya (Persero), 2014–2025

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Abstract

This study examines the associations of asset growth, sales growth, and firm size with capital structure, proxied by the debt-to-equity ratio (DER), at PT Hutama Karya (Persero) during 2014–2025. Using twelve annual observations from secondary financial-report data, the study applies descriptive analysis, multiple linear regression, and classical diagnostic tests in SPSS 25. Asset growth exhibits a negative but statistically insignificant coefficient ($B = -2.367$; $t = -1.679$; $p = .132$). Sales growth is positively associated with DER ($B = 3.675$; $t = 2.540$; $p = .035$), while firm size has a negative association ($B = -1.064$; $t = -2.721$; $p = .026$). The overall model is statistically significant ($F = 4.515$; $p = .039$), with $R^2 = .629$ and adjusted $R^2 = .489$. The results offer company-specific longitudinal evidence on financing patterns in an Indonesian state-owned infrastructure enterprise. Given the small sample and unresolved serial-correlation diagnostic, the findings should be interpreted as associations rather than causal effects

Keywords:

asset growth; sales growth; firm size; capital structure; debt-to-equity ratio; state-owned enterprise.

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INTRODUCTION

Infrastructure development requires substantial and sustained funding, making financing composition a consequential issue for construction enterprises. PT Hutama Karya (Persero), a state-owned infrastructure company involved in the Trans-Sumatera Toll Road, provides a relevant setting for examining leverage dynamics. Capital structure is measured here using total liabilities divided by total equity (DER), rather than treating all forms of debt as equivalent to long-term financing.

Across the twelve observations, DER declined from 5.15 in 2014 to 0.34 in 2025, while firm size, measured as the natural logarithm of total assets, increased from 15.61 to 19.06. The movements of asset growth and sales growth were less uniform. This divergence motivates examination of how expansion, revenue changes, and scale relate to leverage within the same enterprise over time.

Earlier studies report mixed relationships between growth measures and capital structure: Azzahra (2022) and Awaluddin et al. (2019) differ on asset growth, while Suweta and Dewi (2016), Gunadhi and Putra (2019), Naray and Mananeke (2015), and Prabowo et al. (2018) report varying findings concerning sales growth. The present study adds a longitudinal, single-company perspective rather than claiming population-wide generalizability. It tests the partial and joint statistical associations of asset growth, sales growth, and firm size with DER during 2014–2025.

Annual financial indicators

Year	Asset growth	Sales growth	Firm size	DER
2014	0.01	0.04	15.61	5.15
2015	1.06	0.10	16.33	1.35
2016	0.92	0.35	16.98	2.14
2017	1.05	1.12	17.70	4.70
2018	0.32	0.48	17.98	5.08
2019	0.42	-0.01	18.33	2.99
2020	0.25	-0.11	18.55	2.57
2021	0.16	-0.12	18.71	1.43
2022	0.18	0.18	18.87	0.82
2023	0.09	0.12	18.95	0.46
2024	0.15	0.12	19.09	0.42
2025	-0.04	-0.17	19.06	0.34

Source: Annual series reproduced from the submitted manuscript; underlying audited reports and the 2013 base-year figures for 2014 growth rates require author verification.

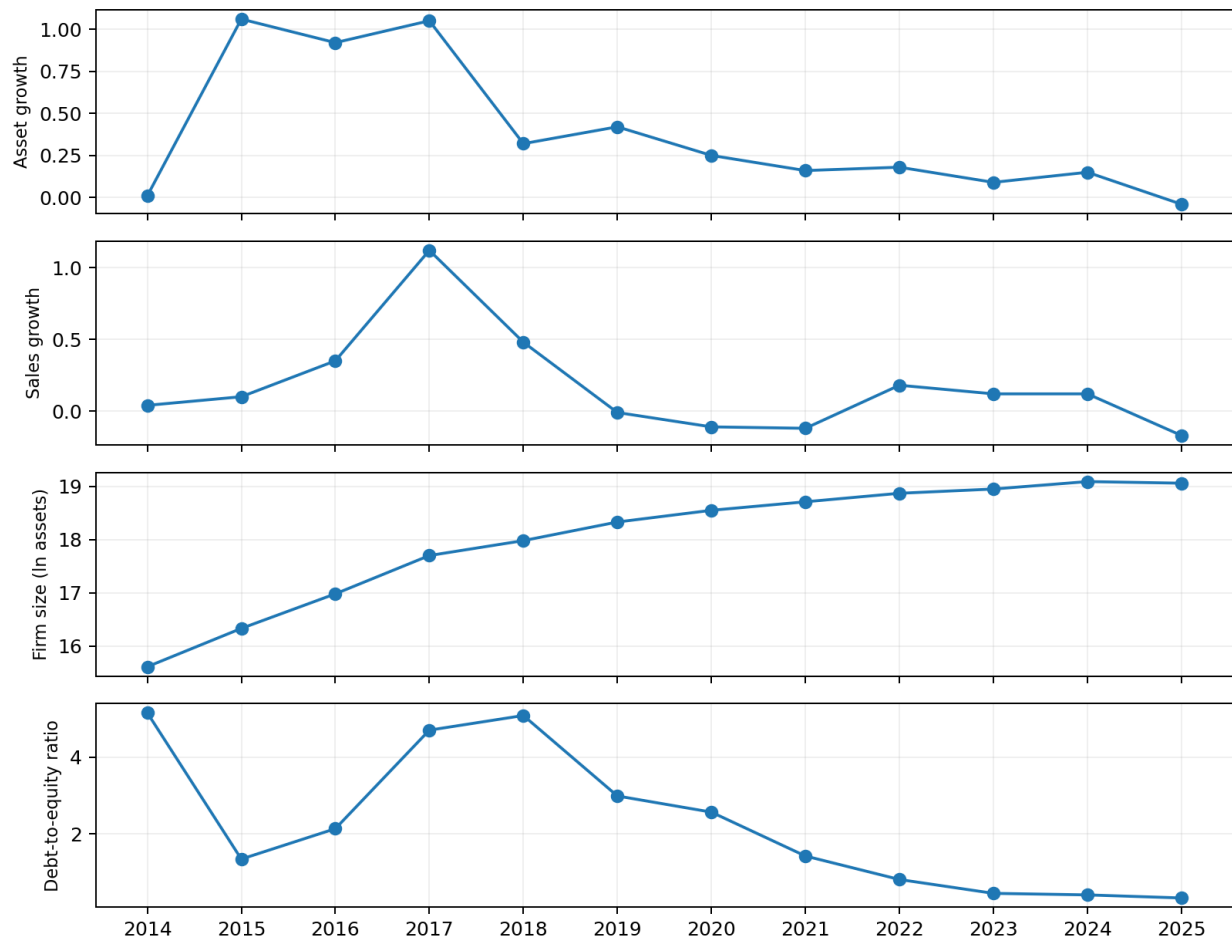


Figure 1. Annual trends in the four reported indicators (2014–2025). Separate panels are used because the variables have different scales.

LITERATURE REVIEW AND HYPOTHESES

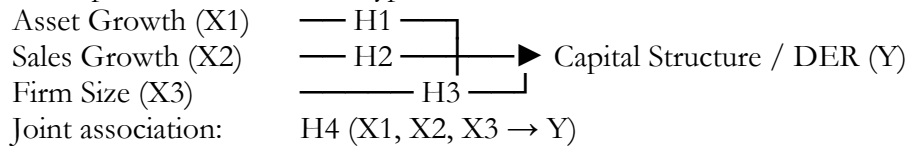
Trade-off and pecking-order perspectives

Trade-off theory considers the tax advantages of debt alongside expected financial-distress costs (Modigliani & Miller, 1963, as discussed in the submitted manuscript). Growing assets may support borrowing capacity when they offer collateral, but expansion does not necessarily increase leverage when equity financing also rises. Pecking-order theory suggests that financing preferences depend on information asymmetry and the availability of internal funds (Myers & Majluf, 1984). Consequently, the relationship between firm size and leverage is theoretically ambiguous: larger firms may have greater borrowing access, yet they may also have alternative financing sources. Neither theory alone establishes a fixed sign or statistical significance for these company-specific coefficients.

Asset growth, sales growth, and firm size

Asset growth represents the annual proportional change in total assets. Sales growth captures the corresponding change in revenue and may be associated with working-capital and project-financing requirements. Firm size is represented by the natural logarithm of total assets. These mechanisms motivate tests of associations with DER while recognizing that state ownership, equity injections, project mandates, and macroeconomic conditions may also affect financing choices.

Conceptual framework and hypotheses



H1: Asset growth is significantly associated with DER. H2: Sales growth is significantly associated with DER. H3: Firm size is significantly associated with DER. H4: The three explanatory variables are jointly associated with DER

METHOD

The research uses a quantitative descriptive and associative design, with PT Hutama Karya (Persero) as the sole unit of analysis and twelve annual observations (2014–2025). The submitted manuscript identifies annual audited financial reports as the secondary data source. The 2014 growth values require access to 2013 comparison figures. With three predictors and only twelve observations (eight residual degrees of freedom), statistical power is limited, coefficient estimates may be sensitive to individual years, and findings cannot be generalized to other firms without further evidence.

Variable	Role	Operational definition	Scale
Capital structure (DER)	Dependent	Total liabilities / total equity	Ratio
Asset growth (PA)	Independent	$(\text{Assets}_t - \text{Assets}_{t-1}) / \text{Assets}_{t-1}$	Ratio
Sales growth (PP)	Independent	$(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$	Ratio
Firm size (FZ)	Independent	Natural logarithm of total assets	Log-transformed measure

The estimated specification is $\text{DER}_t = \alpha + \beta_1 \text{PA}_t + \beta_2 \text{PP}_t + \beta_3 \text{FZ}_t + \epsilon_t$. The submitted analysis uses SPSS 25 and reports descriptive statistics, normality, multicollinearity, heteroscedasticity, autocorrelation diagnostics, OLS regression, t-tests, and an F-test at $\alpha = .05$. Inferences should be treated cautiously given the time-series structure and small sample.

RESULTS AND DISCUSSION

Descriptive statistics

Statistic	Asset growth	Sales growth	Firm size	DER
N	12	12	12	12
Minimum	−0.04	−0.17	15.61	0.34
Maximum	1.06	1.12	19.09	5.15
Mean	0.3825	0.1767	17.93	2.21
Std. deviation	0.36609	0.35152	1.13053	1.82870

Classical assumption diagnostics

Diagnostic	Reported result	Editorial interpretation
Kolmogorov–Smirnov residual normality	Asymp. Sig. = .200	Normality not rejected at .05; not proof of normality.
Multicollinearity: PA	Tolerance .487; VIF 2.053	No high VIF indicated.
Multicollinearity: PP	Tolerance .596; VIF 1.677	No high VIF indicated.
Multicollinearity: FZ	Tolerance .770; VIF 1.299	No high VIF indicated.
Heteroscedasticity	Scatterplot: no clear pattern reported	Visual judgment only; quantitative test not provided.
Autocorrelation	Durbin–Watson .518; Runs Test p = .130	Serial correlation remains unresolved; a non-significant Runs Test does not establish its absence.

Multiple regression and model fit

Predictor	B	SE	t	p
Constant	21.711	7.268	2.987	.017
Asset growth	−2.367	1.410	−1.679	.132
Sales growth	3.675	1.447	2.540	.035
Firm size	−1.064	.391	−2.721	.026

Estimated equation: $DER = 21.711 - 2.367(PA) + 3.675(PP) - 1.064(FZ)$. The intercept represents a mathematical extrapolation when all predictors equal zero and is not substantively meaningful within the observed firm-size range. The model summary reports $R = .793$, $R^2 = .629$, adjusted $R^2 = .489$, and standard error of estimate = 1.30686. Thus, R^2 and adjusted R^2 should not be conflated: the unadjusted model explains 62.9% of observed sample variation, whereas the adjusted estimate is 48.9%.

Source	SS	df	MS	F	p
Regression	23.132	3	7.711	4.515	.039
Residual	13.663	8	1.708		
Total	36.795	11			

Hypothesis summary

Hypothesis	Statistic	p	Finding at $\alpha = .05$
H1: Asset growth	$t = -1.679$	.132	Not supported
H2: Sales growth	$t = 2.540$	.035	Supported; positive coefficient
H3: Firm size	$t = -2.721$	.026	Supported; negative coefficient
H4: Joint model	$F = 4.515$	.039	Supported, subject to diagnostic caveat

DISCUSSION

Asset growth and DER

The negative asset-growth coefficient is not statistically distinguishable from zero at the conventional .05 threshold. The finding does not establish that asset expansion reduces leverage.

One plausible explanation is that the mix of financing sources changed during the study period: the manuscript reports substantial equity growth alongside declining DER. However, attributing this pattern to specific government capital injections or retained earnings would require a verified breakdown of equity movements and financing transactions. This nuance also limits a simple trade-off-theory prediction that more assets necessarily lead to higher debt.

Sales growth and DER

Sales growth is positively associated with DER in the reported regression ($B = 3.675$, $p = .035$). Periods of revenue expansion may coincide with increased project execution and working-capital requirements, potentially raising external financing demand. The high sales-growth figure in 2017 (1.12) coincides with DER of 4.70, but a single year cannot establish the mechanism. This result is consistent with the positive association discussed by Suweta and Dewi (2016) and Gunadhi and Putra (2019), subject to differences in study populations and methods.

Firm size and DER

The reported firm-size coefficient is negative ($B = -1.064$, $p = .026$). The descriptive series shows that firm size increased as DER generally declined, but these co-movements may also reflect shifts in equity and financing policy rather than an autonomous effect of scale. A pecking-order interpretation is plausible if internal resources expanded; nevertheless, equity increases must not automatically be labeled retained earnings or internal financing without component-level evidence. The negative result is specific to this company and observation period.

Joint findings and practical implications

The model F-test is reported as significant ($p = .039$), suggesting a joint statistical association under the fitted OLS specification. However, the low Durbin–Watson statistic warrants re-examination of serial correlation before treating the reported standard errors and p-values as robust. For a state-owned construction enterprise, management may use the descriptive findings as a prompt to examine debt maturities, project cash flows, capital injections, and the sustainability of equity funding, rather than relying on growth ratios alone. Future work should examine financing events, macroeconomic conditions, and project-policy changes with a larger and more suitable dataset.

CONCLUSION

Using twelve annual observations for PT Hutama Karya (Persero), the submitted OLS model reports no statistically significant partial association between asset growth and DER ($p = .132$), a positive association for sales growth ($p = .035$), and a negative association for firm size ($p = .026$). The joint test is reported as significant ($F = 4.515$; $p = .039$), with adjusted $R^2 = .489$. This single-enterprise longitudinal perspective contributes contextual evidence to capital-structure discussions in Indonesian state-owned construction, without establishing causal effects or general applicability across the sector. Limitations include the small number of observations, possible time dependence, the unresolved autocorrelation diagnostic, omitted financing-policy and macroeconomic factors, and reliance on annual aggregate ratios. Further research should verify the source financial statements, inspect the equity composition and state-capital transactions, use appropriate time-series diagnostics and robust inference where feasible, and compare multiple infrastructure enterprises.

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