

ASSET EFFICIENCY AND LEVERAGE ON FIRM VALUE: THE MEDIATING ROLE OF PROFITABILITY IN CONSUMER NON-CYCLICALS

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Abstract: Using Consumer Non-Cyclicals firms listed on the Indonesia Stock Exchange over 2021–2025, this study examines how asset efficiency and leverage relate to firm value and whether profitability transmits these relationships. A purposive sample of 65 firms provides 325 firm-year observations from audited annual reports and market data. Total Asset Turnover, Debt to Equity Ratio, Return on Assets, and Price to Book Value proxy asset efficiency, leverage, profitability, and firm value. The model is estimated with PLS-SEM in SmartPLS 4 using 5,000 bootstrap subsamples, and a panel regression with firm size and year effects serves as a robustness check. Asset efficiency has no significant direct effect on firm value, whereas leverage and profitability raise it. Asset efficiency increases profitability, while leverage reduces it. Profitability does not significantly mediate the link between asset efficiency and firm value but negatively mediates the link between leverage and firm value, a competitive mediation in which the positive direct effect of leverage is partly offset by its negative effect through earnings. Managers should therefore weigh financing decisions against their consequences for profitability.

Keywords: Asset Efficiency, Leverage, Profitability, Firm Value, Consumer Non-Cyclicals.

INTRODUCTION

Market participants commonly judge a listed company's condition and outlook through its firm value. When this value rises, it signals that investors trust management to deploy resources well and to sustain performance. Here, firm value is proxied by Price to Book Value (PBV), obtained by dividing the share's market price by its book value per share, so a larger PBV means the market prices the company above its accounting value.

Asset efficiency is one attribute often linked to firm value. It captures how well a company turns its asset base into sales and is proxied in this study by Total Asset Turnover (TATO). A higher TATO points to more productive deployment of assets in supporting operations and revenue. Even

so, efficiency does not automatically lift firm value if the resulting gains fail to show up in earnings and in investor perceptions.

Leverage, by contrast, stems from how a company chooses to finance itself. It describes the share of activities funded through borrowing and is captured here by the Debt to Equity Ratio (DER). Borrowed funds can support operations and expansion, yet they also enlarge the obligations the company must service, so the way leverage relates to firm value remains an empirical question.

Earlier evidence on how asset efficiency and leverage relate to firm value is mixed. Asset efficiency has been reported to raise firm value significantly (Hulasoh & Mulyati, 2021), while (Christine and Yuniati, 2024) observed a significant

negative association. For leverage, (Johananta and Panjaitan, 2026) documented a significant positive influence on firm value, and (Eleanor et al., 2026) likewise found leverage to be significantly related to PBV, whereas (Setyabudi et al., 2025) reported an adverse effect.

The same lack of agreement appears when profitability is the outcome. (Khasanah et al., 2024) showed that asset efficiency improves profitability, but (Cahyono and Aryani, 2024) detected no meaningful effect. With respect to leverage, (Khasanah et al., 2024) found that it lowers profitability significantly, and (Herdianti and Setiawan, 2025) also identified a leverage effect on profitability among Islamic banks.

Profitability deserves attention because it may be the channel through which operating and financing choices reach firm value. It is proxied here by Return on Assets (ROA). Findings on profitability and firm value are themselves divided: (Rambe et al., 2023) reported that ROA increased firm value significantly among consumer goods firms, while (Ramadhania et al., 2025) found an inverse link. Such divergence suggests that asset efficiency, leverage, profitability, and firm value may not be connected in a single consistent pattern.

(Khasanah et al., 2024) explicitly tested profitability as a mediator between leverage, Total Asset Turnover, and firm value. Evidence for Indonesian Consumer Non-Cyclicals firms over 2021–2025 is still scarce, however, especially on whether profitability carries the effects of asset efficiency and leverage through to firm value.

Signalling Theory offers a lens for interpreting these links. Information about a firm's condition and performance can act

as a signal that outsiders, investors in particular, use to judge its prospects. How efficiently assets are used, how operations are financed, and how much profit is generated all appear in financial information and can therefore shape market valuation.

Two gaps motivate this study. First, earlier Indonesian studies usually examine asset efficiency and leverage in separate models or test profitability as a mediator for only one of them, so it remains unclear whether the same earnings channel transmits operating and financing decisions in the same way. Second, evidence for the Consumer Non-Cyclicals sector in the post-pandemic period, marked by recovery in demand and changing interest rates, is still limited. Analysing 65 Consumer Non-Cyclicals firms from 2021 to 2025, this study estimates the direct and indirect effects of asset efficiency and leverage on firm value within a single PLS-SEM model, reports bootstrap confidence intervals for the indirect effects, and checks the results with a panel regression that controls for firm size and year effects. The results show that profitability carries a negative indirect effect of leverage that runs against its positive direct effect, whereas the indirect effect of asset efficiency is weaker and does not meet the significance criterion. This offers evidence that operating and financing decisions may reach firm value through different mechanisms.

The purpose of this study, therefore, is to analyse how asset efficiency and leverage influence firm value and to test whether profitability mediates these influences among Consumer Non-Cyclicals companies on the Indonesia Stock Exchange during 2021–2025.

LITERATURE REVIEW

Signalling Theory, first formulated by (Spence, 1973) to explain how job applicants signal their productivity to employers under information asymmetry, describes how a better-informed party conveys information to a less-informed one. Inside a company, managers know more about internal conditions and future prospects than investors do, so what is disclosed in financial statements and revealed through financial decisions becomes material that investors rely on to judge quality and outlook (Connelly et al., 2011). Market value thus reflects both a firm's present state and investors' expectations about what lies ahead, which means information on asset management, financing structure, and profitability can all function as signals in how the market prices a company.

Seen through this framework, TATO conveys how effectively a company converts its assets into sales, DER conveys how its operations are financed and how heavily it relies on debt, and ROA conveys how much profit its assets produce. Because investors may weigh all three pieces of information when valuing a company, Signalling Theory provides the conceptual basis for linking asset efficiency, leverage, profitability, and firm value in this study.

Firm value represents the market's appraisal of a company given the information at hand. PBV compares what the market is willing to pay with the company's recorded book value, so a higher ratio denotes a richer valuation. PBV has served as the firm value proxy in studies of turnover, profitability, and valuation; (Hulasoh and Mulyati, 2021), for instance, used it and showed that Total Asset Turnover raised PBV among

property and real estate firms. Under Signalling Theory, movements in financial indicators supply information investors use to judge prospects, so firm value is treated here as the outcome of market perceptions of corporate condition and performance.

Asset efficiency, measured by TATO, indicates how fully a company's total assets are put to work in generating sales. When more revenue is produced from the same asset base, this can tell outsiders that management handles corporate resources well. Prior evidence on TATO and firm value is nonetheless mixed. (Hulasoh and Mulyati, 2021) found a positive TATO effect on PBV for property and real estate firms, while (Johananta and Panjaitan, 2026), working in a setting closer to ours, analysed TATO, DER, and ROA against PBV for Consumer Non-Cyclicals firms on the Indonesia Stock Exchange in 2016–2024 and concluded that activity, leverage, and profitability ratios still help explain valuation in this sector. Differences in setting, period, and results justify testing the relationship again for 2021–2025, leading to the first hypothesis: **H₁**: Asset efficiency positively affects firm value.

Leverage refers to the portion of a company's financing supplied by debt and is measured by DER, which divides total liabilities by total equity. Borrowing pays off when the funds earn more than they cost, but rising debt also adds to obligations and to financial risk. From a signalling standpoint, the debt structure can reveal management's strategy and expectations as well as the risks the company faces, information outsiders use to assess quality and prospects (Connelly et al., 2011). The empirical record is again uneven. (Johananta and Panjaitan, 2026) found DER to raise firm value significantly among Consumer Non-Cyclicals firms, and (Eleanor et al., 2026) reported a significant

DER–PBV association for 2021–2025. (Viki et al., 2025), in contrast, found that leverage reduced firm value for Consumer Non-Cyclicals firms over 2014–2023, as did (Setyabudi et al., 2025). Because the relationship appears to shift with the period and sample examined, the second hypothesis is: **H₂**: Leverage positively affects firm value.

Profitability expresses a company's capacity to earn from the resources it controls, and ROA relates net income to the total assets employed. Earnings are among the items investors watch most closely, and a steady ability to generate them speaks to current performance and future economic benefits. In Signalling Theory terms, ROA therefore carries information investors can use to evaluate corporate quality. Studies in the Consumer Non-Cyclicals sector support its relevance for valuation: (Johananta and Panjaitan, 2026) included ROA alongside DER and TATO as predictors of PBV, and (Soimah et al., 2026) treated ROA as a determinant of firm value for 2021–2024. On both conceptual and empirical grounds, the third hypothesis is: **H₃**: Profitability positively affects firm value.

Asset efficiency may also feed into profitability. Producing more revenue from existing resources can, provided costs are kept under control, translate into higher earnings. (Khasanah et al., 2024) support this reasoning: using TATO as the predictor and ROA as the profitability measure for Indonesian mining firms in 2018–2022, they found that TATO raised profitability significantly. A company that sells more from its assets may therefore also earn more from them, giving the fourth hypothesis: **H₄**: Asset efficiency positively affects profitability.

Leverage may shape profitability as well. Debt supplies money for operations

and investment, but it also brings repayment obligations and interest costs. As financing costs climb, the earnings left to the company can shrink, implying an inverse relationship. (Khasanah et al., 2024) observed that DER significantly lowered profitability among Indonesian mining firms, suggesting that heavier reliance on borrowing can weaken earning capacity. Since their evidence comes from mining, the link warrants testing in the Consumer Non-Cyclicals sector, hence: **H₅**: Leverage negatively affects profitability.

Asset efficiency may influence firm value only indirectly. Using assets well could first strengthen earning capacity, and the resulting profitability could then inform how investors judge performance and prospects. Evidence for this indirect route is inconsistent. (Suriawinata et al., 2023), applying structural equation modeling to 61 non-cyclical consumer goods firms in Indonesia over 2016–2021, found that asset turnover influenced firm value directly and had a positive total effect. (Fikri et al., 2026), studying property and real estate firms in 2022–2024, found that asset turnover improved both profitability and firm value, yet profitability did not act as a mediator. Profitability therefore may not reliably connect asset efficiency with firm value, and the relationship is re-examined for Consumer Non-Cyclicals firms in 2021–2025: **H₆**: Profitability mediates a positive effect of asset efficiency on firm value.

Leverage, too, may reach firm value by way of profitability. Debt alters the financing structure and generates interest costs that can erode earnings, and lower earnings may then colour investors' perceptions. When borrowed funds are invested productively and earn adequate returns, however, the link between leverage and value may look different. Prior findings diverge. (Viki et al., 2025), using DER, ROA, and PBV for Consumer Non-

Cyclicals firms over 2014–2023, found no mediating role for profitability. (Khasanah et al., 2024) likewise reported that leverage cut profitability among mining firms but that profitability did not carry the leverage effect to firm value. (Soimah et al., 2026), on the other hand, found such mediation among Consumer Non-Cyclicals firms in 2021–2024. Given these differences, the seventh hypothesis is: **H7**: Profitability mediates a negative effect of leverage on firm value.

Building on Signalling Theory and the studies reviewed, the research model treats TATO (asset efficiency) and DER (leverage) as exogenous variables, ROA (profitability) as the mediator, and PBV (firm value) as the endogenous outcome. Seven paths are tested: (1) TATO to PBV, (2) DER to PBV, (3) ROA to PBV, (4) TATO to ROA, (5) DER to ROA, (6) TATO to PBV via ROA, and (7) DER to PBV via ROA. The model thus asks both whether the two financial characteristics are associated with firm value and whether profitability accounts for those associations.

RESEARCH METHODS

A quantitative, explanatory design is adopted to analyse how asset efficiency, leverage, profitability, and firm value are related. The setting is Consumer Non-Cyclicals companies listed on the IDX between 2021 and 2025, and all data are secondary, taken from annual financial reports and from market information published by the exchange and on each company's website.

All 110 Consumer Non-Cyclicals companies listed on the exchange during 2021–2025 form the population. Firms were chosen purposively, with the requirement that their initial public

offering (IPO) took place before 2021, so firms that went public in 2021 or later were dropped. This left 65 companies, each followed for five years, for a total of 325 firm-year observations, as shown in Table 1. The firm is the unit of analysis. Sales, total assets, total liabilities, total equity, net income, year-end share prices, and book value per share were collected from each firm's audited annual report and from IDX market data, and the four ratios were computed from these figures and then recomputed by the authors as a check. Because the sampling criterion required listing throughout the period, all 65 firms have complete data for 2021–2025, so no observations are missing and no imputation was needed. Extreme values of DER and PBV were retained because they reflect actual firm conditions, and the bootstrap procedure used for inference does not require normally distributed data.

Table 1. Sample Selection

Sample Selection Criteria	Number
Consumer Non-Cyclicals companies listed on the IDX during 2021–2025	110
Companies conducting IPO in 2021 or thereafter	(45)
Companies meeting the sample criteria	65
Observation period	5 years
Total company-year data (65×5)	325

Source: Processed by the authors (2026)

The model contains two exogenous variables, one mediator, and one endogenous variable. Asset efficiency (X1) captures how well total assets are turned into sales and is proxied by TATO. Leverage (X2) captures reliance on borrowed funds relative to shareholders' equity and is proxied by DER. Profitability (M) captures the earnings produced from total assets and is proxied by ROA, and firm value (Y) captures how the

market prices the company against its book value and is proxied by PBV. Each construct is indicated by its yearly ratios for 2021–2025 (TATO2021–TATO2025, DER2021–DER2025, ROA2021–ROA2025, and PBV2021–PBV2025), all on a ratio scale. Table 2 summarises how each variable is computed.

Table 2. Variable Operationalization

Variable	Measurement
Asset Efficiency (TATO, X1)	Sales / Total Assets
Leverage (DER, X2)	Total Liabilities / Total Equity
Profitability (ROA, M)	Net Income / Total Assets
Firm Value (PBV, Y)	Market Price per Share / Book Value per Share

Source: Processed by the authors (2026)

The analysis relies on PLS-SEM estimated in SmartPLS 4 (Hair et al., 2021), for three reasons. First, the study aims to explain a mediation model in which direct and indirect paths are estimated simultaneously. Second, each construct is measured by its five annual ratios, which are treated as reflective indicators of a firm's persistent level of asset efficiency, leverage, profitability, and firm value over 2021–2025; the high outer loadings reported below support this treatment. Third, the number of cases is modest ($n = 65$) and DER and PBV are strongly skewed, and PLS-SEM with bootstrapping does not require normally distributed data. Each company is therefore treated as one case, so the 325 firm-year observations enter the model as 65 cases with five annual indicators per construct. A panel-data approach would instead use year-to-year variation within firms; because it offers a useful check, a pooled panel regression is reported as a robustness test. Measurement quality is judged from

indicator loadings, internal consistency (Cronbach's alpha and composite reliability), convergent validity (AVE), and discriminant validity (Fornell-Larcker and HTMT), while the structural model is checked through VIF, R^2 , and f^2 . The two structural equations are:

$$ROA = \beta_1 TATO + \beta_2 DER + \varepsilon_1 \quad (1)$$

$$PBV = \beta_3 TATO + \beta_4 DER + \beta_5 ROA + \varepsilon_2 \quad (2)$$

Significance is assessed through bootstrapping with 5,000 subsamples in SmartPLS 4, using each path's coefficient, t-value, and p-value. One-tailed tests are applied because every hypothesis states an expected direction derived from Signalling Theory and prior evidence, and a hypothesis is supported when t is greater than 1.645 with p under 0.05. For each effect, the 90% percentile bootstrap confidence interval is also reported, which corresponds to the one-tailed 5% level. Mediation is examined through the specific indirect effects of TATO and DER on PBV via ROA. As a robustness check, the structural relations are re-estimated as pooled panel regressions on the 325 firm-year observations, adding firm size (SIZE, the natural logarithm of total assets) and year dummies as controls, with standard errors clustered by firm.

RESULTS AND DISCUSSION

Table 3 summarises the descriptive statistics for asset efficiency, leverage, profitability, and firm value over 2021–2025.

Table 3. Descriptive Statistics Of Research Variables, 2021–2025

Year	Var.	Min.	Max.	Mean	SD
2021	TATO	0.035	3.838	1.176	0.818
	DER	0.117	14.963	1.636	2.536
	ROA	−0.210	0.343	0.060	0.091
	PBV	0.336	44.309	4.639	8.082
2022	TATO	0.037	3.576	1.216	0.773
	DER	0.109	29.317	2.137	4.643

Year	Var.	Min.	Max.	Mean	SD
2023	ROA	-0.203	0.293	0.058	0.080
	PBV	0.303	49.983	4.614	8.800
	TATO	0.048	3.347	1.249	0.763
	DER	0.103	38.172	1.701	4.685
2024	ROA	-0.148	0.944	0.070	0.136
	PBV	0.102	39.828	3.323	6.904
	TATO	0.163	3.355	1.223	0.749
	DER	0.071	14.459	1.366	2.123
2025	ROA	-0.185	0.332	0.058	0.078
	PBV	0.069	33.459	2.852	5.763
	TATO	0.021	3.914	1.229	0.727
	DER	0.070	11.373	1.364	1.884
	ROA	-0.188	0.382	0.057	0.091
	PBV	0.332	29.232	3.024	5.142

Note: N = 65 for each variable and year; SD = standard deviation.

Source: Processed using SmartPLS 4 (2026)

According to Table 3, average TATO barely changed over the period, edging up from 1.176 in 2021 to 1.229 in 2025. Average DER was less stable, peaking at 2.137 in 2022 and falling to 1.364 by 2025. Average ROA stayed within a narrow band of 0.057 to 0.070, pointing to fairly steady profitability. Average PBV dropped from 4.639 in 2021 to 2.852 in 2024 and then recovered slightly to 3.024 in 2025. The wide standard deviations, notably for DER and PBV, reveal considerable heterogeneity in the financial profiles of the sampled firms.

Before turning to the structural paths, the measurement model was checked. The first estimation showed that ROA2023 loaded below 0.70, so this indicator was removed. In the final model, asset efficiency, leverage, and firm value each retain five yearly indicators, while profitability retains four (ROA2021, ROA2022, ROA2024, and ROA2025). Table 4 reports the final measurement results.

Table 4. Measurement Model Evaluation

Construct	Outer Loadings	α	CR	AVE
Asset Efficiency (TATO)	0.900–0.982	0.977	0.982	0.915
Leverage (DER)	0.783–0.915	0.891	0.920	0.697
Profitability (ROA)	0.867–0.935	0.923	0.946	0.813
Firm Value (PBV)	0.725–0.938	0.895	0.922	0.704

Note: α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted.

Source: Processed using SmartPLS 4 (2026)

Every remaining indicator loads above 0.70 and every construct has an AVE greater than 0.50, so convergent validity is satisfied. Internal consistency is also adequate, with both Cronbach's alpha and composite reliability exceeding 0.70 for all constructs. For discriminant validity, the square root of each construct's AVE (asset efficiency = 0.957; leverage = 0.835; profitability = 0.902; firm value = 0.839) is larger than that construct's correlations with the others, meeting the Fornell-Larcker criterion, and HTMT ratios fall between 0.104 and 0.550, comfortably under 0.90.

The structural model was assessed next. Table 5 reports R^2 , which shows how much of the variation in each endogenous construct the model accounts for.

Table 5. Coefficient Of Determination (R^2)

Endogenous Variable	R^2	Adjusted R^2
Profitability (ROA)	0.124	0.096
Firm Value (PBV)	0.608	0.589

Source: Processed using SmartPLS 4 (2026)

With an R^2 of 0.124, asset efficiency and leverage together account for 12.4% of the variation in ROA. Following Hair et al. (2021), this explanatory power is weak, which is expected because profitability also

depends on factors outside the model, such as pricing, cost structure, and product mix; the model is not intended to explain profitability fully but to capture the part linked to asset use and financing. For PBV, R^2 reaches 0.608, a moderate level, meaning asset efficiency, leverage, and profitability jointly account for 60.8% of its variation. The adjusted values are 0.096 for ROA and 0.589 for PBV. Table 6 then reports f^2 , which gauges how much each exogenous construct adds to explaining the endogenous ones.

Table 6. Effect Size (f^2)

Relationship	f^2	Interpretation
TATO → PBV	0.025	Small
TATO → ROA	0.034	Small
DER → PBV	1.130	Large
DER → ROA	0.111	Small
ROA → PBV	0.729	Large

Source: Processed using SmartPLS 4 (2026)

TATO adds little to explaining either PBV ($f^2 = 0.025$) or ROA ($f^2 = 0.034$), and DER has a small effect on ROA ($f^2 = 0.111$). ROA has a large effect on PBV ($f^2 = 0.729$), and DER has a very large effect on PBV ($f^2 = 1.130$). The last value calls for caution: f^2 values above 1 are unusual, and its 90% bootstrap interval is wide (0.121 to 2.897), indicating that a few firms with very high DER and PBV weigh heavily on the estimate. Collinearity was checked with VIF, whose values lie between 1.001 and 1.142, well beneath 5, so multicollinearity is not a concern.

Tables 7 and 8 present the bootstrapped direct and indirect effects with their 90% confidence intervals. Of the seven paths, five meet the significance criterion and two do not.

Table 7. Direct Effects

H	Path	β	t	p	90% CI	Supp.
H1	TATO → PBV (+)	0.101	1.244	0.107	[-0.039; 0.224]	No
H2	DER → PBV (+)	0.702	3.729	<0.001	[0.331; 0.942]	Yes
H3	ROA → PBV (+)	0.571	4.946	<0.001	[0.349; 0.733]	Yes
H4	TATO → ROA (+)	0.174	1.815	0.035	[0.015; 0.325]	Yes
H5	DER → ROA (-)	-0.313	1.932	0.027	[-0.561; -0.026]	Yes

Note: bootstrapping with 5,000 subsamples; one-tailed test; t = t-statistic; p = p-value; 90% CI = percentile bootstrap confidence interval; Supp. = hypothesis supported.

Source: Processed using SmartPLS 4 (2026)

Table 8. Indirect Effects

H	Path	β	t	p	90% CI	Supp.
H6	TATO → ROA → PBV (+)	0.099	1.632	0.051	[0.008; 0.200]	No
H7	DER → ROA → PBV (-)	-0.179	1.823	0.034	[-0.347; -0.016]	Yes

Note: bootstrapping with 5,000 subsamples; one-tailed test; t = t-statistic; p = p-value; 90% CI = percentile bootstrap confidence interval; Supp. = hypothesis supported.

Source: Processed using SmartPLS 4 (2026)

TATO is not significantly related to PBV ($\beta = 0.101$; $t = 1.244$; $p = 0.107$), so H1 is not supported. DER raises PBV significantly ($\beta = 0.702$; $t = 3.729$; $p < 0.001$), supporting H2, and ROA also raises PBV significantly ($\beta = 0.571$; $t = 4.946$; $p < 0.001$), supporting H3. TATO increases ROA ($\beta = 0.174$; $t = 1.815$; $p = 0.035$), supporting H4, whereas DER reduces ROA ($\beta = -0.313$; $t = 1.932$; $p = 0.027$), supporting H5. For the indirect effects, the path from TATO to PBV via ROA does not meet the significance criterion ($\beta = 0.099$; $t = 1.632$; $p = 0.051$), so H6 is not supported, although its 90% confidence interval (0.008 to 0.200) lies just above zero. The path from DER to PBV via ROA is negative and significant ($\beta = -0.179$; $t = 1.823$; $p = 0.034$; 90% CI -0.347 to -0.016), supporting H7.

The robustness check supports these results (Table 9). In the panel regressions on 325 firm-year observations with year effects and firm-clustered standard errors, TATO raises ROA ($b = 0.023$; $p = 0.020$) and DER lowers it ($b = -0.006$; $p = 0.003$). In the PBV equation, DER remains positive and significant ($b = 0.971$; $p < 0.001$), TATO remains insignificant ($b = 1.192$; $p = 0.142$), and ROA stays positive ($b = 22.357$; $p = 0.056$ two-tailed, 0.028 one-tailed). Firm size is insignificant in both equations, so the main results are not driven by differences in firm size. A firm-level bootstrap of the indirect effects again gives a negative effect of leverage through profitability whose 90% interval excludes zero, and a positive effect of asset efficiency whose interval also lies above zero, consistent with the marginal PLS-SEM result for H6.

Table 9. Robustness Check: Panel Regression With Firm Size And Year Effects

Variable	ROA	PBV
TATO	0.023 (0.020)	1.192 (0.142)
DER	-0.006 (0.003)	0.971 (<0.001)
ROA	–	22.357 (0.056)
SIZE	0.008 (0.126)	-0.025 (0.925)
Year effects	Yes	Yes
Observations	325	325
R ²	0.093	0.295

Note: unstandardised coefficients from pooled OLS; two-tailed p-values in parentheses, based on standard errors clustered by firm (65 firms); SIZE = natural logarithm of total assets.

Source: Processed by the authors (2026)

That asset efficiency fails to move firm value suggests that, although a higher TATO means assets generate more sales, this operational strength did not translate into market valuation during the period studied. In signalling terms, TATO tells investors something about how well management uses resources, but investors

may give more weight to profitability, financing structure, risk, and growth when pricing a company. The small f^2 for TATO on PBV fits this weak statistical link. The result echoes (Eleanor et al., 2026), who found no significant partial TATO effect on PBV for Consumer Non-Cyclicals firms in 2021–2025, but departs from (Johananta and Panjaitan, 2026), who reported a positive and significant TATO effect for the same sector in 2016–2024. Such differences imply that the link between TATO and value may depend on the period, the sample, and the other variables modelled. Here, asset efficiency seems to be an operational trait that does not, by itself, account for shifts in firm value, which motivates checking whether its influence passes through profitability.

Leverage, by contrast, raises firm value significantly. This positive association should be read with care. Part of it may be mechanical: DER and PBV share book equity in their denominators, so firms with thin book equity, for instance after large dividend payouts, show both a high DER and a high PBV, and the very large f^2 with its wide bootstrap interval points in the same direction. Beyond this, borrowed funds can expand the resources available for operations and investment, and a firm's ability to raise debt may itself signal lenders' confidence in its prospects, so the market need not penalise debt financing. The result agrees with (Eleanor et al., 2026), who found DER significantly related to PBV among Consumer Non-Cyclicals firms in 2021–2025, and with Johananta and Panjaitan (2026), who found DER to raise firm value in the same sector. It does not imply that adding debt will lift firm value, since the outcome depends on how the debt is used and whether the company can meet its obligations, a caveat reinforced by the

negative effect of leverage on profitability discussed below.

Profitability likewise raises firm value significantly and with a large f^2 , making it a major contributor to explaining firm value in the model. Companies that earn more from their assets thus tend to be valued more highly. Earnings figures tell investors about performance and about the economic benefits a company can extract from its resources, which, under Signalling Theory, makes them relevant to valuation. The result matches (Nugrahini et al., 2025), who found profitability positively and significantly tied to firm value among Consumer Non-Cyclicals companies, and (Eleanor et al., 2026), who reported a significant ROA effect on PBV in the same sector for 2021–2025. This finding is central to interpreting the mediation tests for H6 and H7.

Asset efficiency also lifts profitability significantly, showing that Consumer Non-Cyclicals firms that use their assets more productively tend to earn more. Generating more sales from the same resources, combined with sound cost control, can convert extra operating activity into extra profit. The result supports (Khasanah et al., 2024), who likewise found TATO to raise profitability, but not (Cahyono and Aryani, 2024), who found no such effect, a gap that may reflect differences between industries and firm circumstances.

Leverage, in contrast, lowers profitability significantly, so firms that lean more on borrowing tend to earn less in this sample. A plausible reason is that debt carries repayment obligations and interest costs, and if the returns from borrowed funds do not cover these costs, earnings decline. The result agrees with (Khasanah et al., 2024), who also reported an inverse link between leverage and profitability.

Combined with the positive influence of profitability on firm value, this finding underpins the negative indirect effect of leverage on firm value through profitability.

The indirect path from asset efficiency to firm value via profitability is positive but does not meet the significance criterion ($p = 0.051$), so H6 is not supported. Each leg of the path is significant on its own, since TATO raises ROA and ROA raises PBV, yet their product falls just short of the required level. Its 90% bootstrap confidence interval (0.008 to 0.200) lies slightly above zero, the total effect of TATO on PBV is significant ($\beta = 0.201$; $p = 0.014$), and the panel robustness check gives a similar positive estimate, so a weak indirect effect cannot be ruled out and should be confirmed with a larger sample. The result is in line with (Khasanah et al., 2024), who found no mediating role of profitability between TATO and firm value, and with (Fikri et al., 2026), who found that asset turnover improved profitability and firm value while profitability did not significantly mediate between them. Gains in operating efficiency, then, do not reliably become higher valuations through earnings, since financing structure, risk, growth, and market conditions may also weigh on how the market prices a company.

The indirect path from leverage to firm value via profitability is negative and significant ($p = 0.034$), and its 90% confidence interval excludes zero, so H7 is supported. The sign arises because leverage lowers profitability while profitability raises firm value. Combined with the positive direct effect, this produces what (Hair et al., 2021) call competitive mediation: the direct and indirect effects point in opposite directions. The negative indirect effect (-0.179) offsets about a quarter of the positive direct effect (0.702), leaving a total effect of 0.524 ($p = 0.007$). Two forces are

therefore at work. Debt finances operations and growth and may signal confidence in future cash flows, which the market rewards, while the interest burden that comes with debt erodes earnings, and lower earnings send a negative signal. This result contrasts with (Khasanah et al., 2024) and (Viki et al., 2025), neither of whom found profitability to mediate between leverage and firm value, but agrees with (Soimah et al., 2026), who observed such mediation among Consumer Non-Cyclicals firms in 2021–2024. Leverage therefore affects firm value not only directly but also through its consequences for earnings.

Overall, profitability plays a different role for the two financial characteristics. For leverage, it carries a significant negative indirect effect that runs against the positive direct effect. For asset efficiency, the direct effect is insignificant and the indirect effect through profitability is positive but marginal: its confidence interval lies just above zero, but it does not meet the t-test criterion adopted in this study. The contrast between the two paths is therefore one of strength rather than of kind, and it reflects a difference in statistical significance rather than a formally tested difference in size. Even so, it indicates that profitability does not serve as one uniform channel for different financial characteristics, which is the study's main contribution.

Theoretically, the results refine the use of Signalling Theory by showing that the same piece of financial information can send signals of opposite sign: debt is associated with a higher valuation directly, but through its burden on earnings it is associated with a lower one. Profitability is therefore best viewed as one channel among several rather than as a single

transmission mechanism. Practically, the findings support two implications. Managers should evaluate borrowing decisions together with their effect on profitability, because the earnings cost of debt partly offsets its positive association with firm value. Investors should read DER together with ROA and with the size of book equity rather than interpreting a high DER or a high PBV in isolation. The results do not support the view that raising asset turnover alone will lift market valuation.

This study has several limitations. First, the sample is limited to 65 Consumer Non-Cyclicals firms over 2021–2025, so the findings may not generalise to other sectors or periods. Second, the PLS-SEM model treats each firm's five annual ratios as indicators of one construct and therefore captures differences between firms rather than changes within firms over time; the panel regression addresses this only in part. Third, the model explains a modest share of the variation in profitability ($R^2 = 0.124$), and DER and PBV share book equity in their denominators, which may inflate their association. Fourth, the hypotheses are tested one-tailed and the indirect effect of asset efficiency lies close to the significance threshold, so the mediation results should be confirmed with larger samples.

CONCLUSION AND SUGGESTION

For Consumer Non-Cyclicals companies on the Indonesia Stock Exchange in 2021–2025, the study finds that asset efficiency does not directly increase firm value, while leverage and profitability are both associated with higher valuations. Using assets more productively strengthens profitability, whereas relying more on debt weakens it. Profitability is a channel through which leverage reduces firm value by eroding earnings, partly offsetting the

positive direct association between leverage and firm value, whereas the channel from asset efficiency through profitability is weak and not clearly established. These results show that profitability does not link every financial characteristic to firm value in the same way and that, consistent with Signalling Theory, financial information may affect valuation through different and even opposing routes depending on the kind of corporate decision involved. The findings hold after controlling for firm size and year effects.

In light of these results, managers should assess borrowing by its effect on profitability, not only by the resources it provides, and should keep debt and the obligations attached to it under careful control, while investors should consider leverage together with profitability and the size of book equity. Future studies could cover a longer period and additional sectors, use panel-data or dynamic models able to capture changes within firms over time, use leverage measures that do not depend on book equity, such as debt to total assets, add determinants of profitability such as growth opportunities, dividend policy, liquidity, and macroeconomic conditions, and draw on larger samples to confirm the indirect effect of asset efficiency.

THE USE OF AI OR AI-ASSISTED TECHNOLOGIES

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