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Effects of Leverage, Size, ROA, GDP on Firm Value: Indonesia Automotive & Allied 2022–2024

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Abstract. This study investigates the effects of Financial Leverage, Firm Size, Return on Assets (ROA), and Gross Domestic Product (GDP) on firm value among Automotive & Allied Products issuers listed on the Indonesia Stock Exchange during 2022–2024. Data from 10 companies (N = 30 firm-years), sourced from ICMD and financial reports, were analyzed using panel data regression. Based on Chow, Hausman, and Lagrange Multiplier tests, the Random Effects Model (REM) was selected. Results show that GDP significantly and positively influences firm value (β = 0.016750; p = 0.0206), while leverage, firm size, and ROA do not show significant effects. The joint F-test is also insignificant (F = 1.531921; p = 0.223398) with an Adjusted R^2 of 0.068353. These findings suggest that macroeconomic factors play a more dominant role in valuing cyclical sectors like automotive, compared to short-term firm-specific indicators. Managerial implications include adopting cycle-sensitive planning, enhancing cash flow resilience, and cautious debt and scale management. This study contributes post-pandemic insights to emerging-market literature and recommends future research with broader timeframes, dynamic models, and additional variables to address endogeneity and improve result robustness.

Keywords: Financial Leverage; Firm Size; Firm Value; GDP; ROA

1. INTRODUCTION

Firm value is a comprehensive indicator that reflects the market's perception of a company's prospects, risks, and capacity to create long-term economic value. In the context of Indonesia's manufacturing industry, the Automotive and Allied Products subsector is compelling because it serves as a supply-chain lever and a key contributor to industrial dynamics, making it sensitive to changes in internal corporate factors and macroeconomic conditions. This study emerges from the need to understand how the combination of firm-level financial characteristics and macro variables—specifically Financial Leverage, Size of the Firm, Return on Assets (ROA), and Gross Domestic Product (GDP)—relates to variation in firm value over a contemporary horizon. (Jihadi et al., 2021; Sudiyatno et al., 2020; Suteja et al., 2023; Dincă et al., 2022.)

Conceptually, leverage, firm size, and profitability are often linked to firm value through several perspectives—among others, capital-structure efficiency, cash-flow-generation capacity, and signals of fundamental strength to investors. Simultaneously, economic growth (GDP) acts as a macro backdrop that affects demand, cost of capital, and market sentiment, potentially amplifying or dampening the link between internal factors and firm value. By placing these four determinants within one empirical framework, this study systematically tests

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the interplay between internal and macro factors and firm value in the automotive and allied products subsector. (Diantimala, 2021; Tran Minh, 2022; Hsu et al., 2022; Thorbecke, 2024.)

From a research-context angle, 2022–2024 represents the recovery/normalization phase after pandemic lockdowns, when demand behavior, production costs, and corporate financing strategies settled into new patterns. Focusing on Automotive and Allied Products on the Indonesia Stock Exchange (IDX) provides a natural laboratory to observe these dynamics because the subsector is tightly connected to consumption, credit, and equipment investment, making it sensitive to business-cycle fluctuations. Accordingly, testing firm-value determinants over this horizon is expected to provide current empirical evidence relevant to Indonesian capital-market academics and practitioners. (Thorbecke, 2021; Marpaung & Rahmat, 2024; Suriani et al., 2024.)

This study uses secondary data from the financial statements of IDX-listed issuers classified into the automotive and related products subsector for 2022–2024. The main data sources are the Indonesian Capital Market Directory (ICMD) and company publications, ensuring each firm-year observation is verifiable. Purposive sampling is applied to ensure completeness of financial data over the observation period, yielding a sample of ten firms that meet the criteria. The sample issuers include PT Astra International Tbk (ASII), PT Astra Otoparts Tbk (AUTO), PT Gajah Tunggal Tbk (GJTL), PT Goodyear Indonesia Tbk (GDYR), PT Hexindo Adiperkasa Tbk (HEXA), PT Indo Kordsa Tbk (BRAM), PT Indospring Tbk (INDS), PT Intraco Penta Tbk (INTA), and PT Multistrada Arah Sarana Tbk (LPIN). (Suteja et al., 2023; Hsu et al., 2022.)

Referring to the research objective, this paper analyzes the influence of Financial Leverage, Size of the Firm, ROA, and GDP on firm value among automotive and allied products manufacturers listed on the IDX during 2022–2024. The empirical tests are expected to: (i) update evidence on the most recent horizon in an emerging market; (ii) enrich academic discourse on the linkage of corporate internal factors and the macro backdrop to firm value; and (iii) offer practical implications for managers and investors in designing capital-structure decisions, profitability strategies, and risk assessments in the automotive subsector. (Jihadi et al., 2021; Sudiyatno et al., 2020; Keswani & Tiwari, 2024; Thorbecke, 2024.)

2. THEORETICAL REVIEW

Anchored in corporate-finance theory, this study draws on three main pillars: trade-off theory, pecking-order theory, and signaling theory. Trade-off frames leverage as the outcome of balancing the tax shield of debt against bankruptcy/financial-distress costs; pecking-order emphasizes financing hierarchies—retained earnings, then debt, then equity—so leverage variation reflects internal cash constraints; signaling views financial decisions and operating performance as signals of quality that markets interpret (or misinterpret). In Indonesia's post-pandemic context, the current manuscript's findings indicate that not all internal signals translate into higher value—e.g., ROA and firm size may not always resonate when profits are volatile or macro uncertainty is elevated—whereas the external signal from GDP dynamics can be more dominant in shaping valuation expectations. (Pratt, 2023; Diantimala, 2021; Suteja et al., 2023; Thorbecke, 2024.)

Firm value in this study is positioned as investors' perception of future cash-flow prospects and risk, practically connected to stock price and market-based measures (e.g., Tobin's Q or PBV). The manuscript's conceptual definition emphasizes firm value as the "fair price" a buyer is willing to pay, closely tied to how markets assess a firm's ability to generate future earnings and cash flows. Maximizing value thus requires a combination of efficient financing access and operational performance that credibly reassures investors. (Lim & Mali, 2024; de Oliveira & Basso, 2024; Chakkravarthy et al., 2024.)

Within this framework, financial leverage is understood as the intensity of debt use to amplify shareholders' returns. The manuscript treats it as the responsiveness of after-tax profit (EAT) to changes in operating profit (EBIT), capturing the capital-structure "lever" on net income. Theoretically, trade-off predicts a non-linear relationship: leverage increases value via the tax shield up to the point where distress/agency costs dominate; pecking-order often yields a negative association when debt substitutes for scarce internal cash. (Pratt, 2023; Jihadi et al., 2021; Bahraïni et al., 2021.)

Firm size is commonly viewed as a signal of resource capacity, diversification, and better capital-market access, and in many contexts correlates positively with value. However, the manuscript notes that "big assets/sales" signals are not always effective; investors often assign more weight to growth prospects and governance stability than sheer scale, explaining why size does not invariably raise firm value under certain conditions. (Diantimala, 2021; Sudiyatno et al., 2020.)

Profitability measured by ROA is theoretically a strong signal of operational efficiency and cash-flow generation; thus many studies find a positive effect on value. Yet, this

manuscript cautions that in volatile earnings environments or heightened macro uncertainty, markets may discount ROA's credibility, weakening its effect on firm value. (Chakkravarthy et al., 2024; Dincă et al., 2022.)

At the macro level, GDP growth reflects aggregate-demand opportunities and systemic risk sentiment. From a signaling perspective, GDP serves as an "external signal" updating market expectations about revenue and risk discounts—especially for automotive and related products—so it is conceptually expected to correlate positively with firm value. Evidence in the manuscript supports the weight of this external signal, explaining why macro variables can "dominate" certain internal signals in explaining valuation dynamics. (Hsu et al., 2022; Thorbecke, 2024; Marpaung & Rahmat, 2024.)

In sum, the theoretical relations are: (i) leverage has an ambiguous effect—positive at moderate levels via the tax shield but potentially negative as distress/agency costs rise; (ii) size tends to be positive but is contextual, influenced by growth and governance credibility; (iii) ROA is generally positive but may be insignificant if perceived as fragile; and (iv) GDP is expected to be positive as a lever on cash-flow expectations and a reducer of systemic-risk perceptions. These propositions link capital-structure theory, information asymmetry, and signal-based pricing to Indonesian automotive manufacturing in 2022–2024, while providing a foundation for hypotheses and empirical specification. (Pratt, 2023; Sudiyatno et al., 2020; Diantimala, 2021; Thorbecke, 2024.)

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3. RESEARCH METHODOLOGY

This study employs a quantitative-explanatory approach combining descriptive statistics (means, standard deviations, frequencies) and inferential testing based on panel-data regression. Descriptive statistics profile the data, while inferential tests estimate the effects of Financial Leverage, Firm Size, ROA, and GDP on firm value. (Suteja et al., 2023.)

The population/sample comprises IDX-listed Automotive & Allied Products manufacturers, 2022–2024. Secondary data come from ICMD and issuer filings; purposive sampling criteria are: (1) automotive/related firms with complete 2022–2024 financials; (2) availability of all variables. Ten firms qualify (ASII, AUTO, GJTL, GDYR, HEXA, BRAM, INDS, INTA, LPIN, MASA), giving N = 30 firm-years. Estimation uses EViews 13. (Suteja et al., 2023.)

Operational definitions: The dependent variable is Firm Value (Y), represented by market-based measures; the manuscript mentions PBV and the natural log of Tobin's Q. Independent variables include Financial Leverage (X1), Firm Size (X2), ROA (X3), and GDP

(X4). Conceptual leverage follows literature linking it to sensitivity of net income to EBIT; empirically, leverage and other variables are treated as standard covariates in the panel model. (Lim & Mali, 2024; de Oliveira & Basso, 2024.)

Empirical model and estimation: Relationships are estimated via panel regression with three candidates: Common Effect Model (CEM/pooled OLS), Fixed-Effects Model (FEM), and Random-Effects Model (REM). Model choice proceeds sequentially with the Chow test (CEM vs FEM), the Hausman test (FEM vs REM), and the Breusch-Pagan LM test (CEM vs REM). Results here indicate: Chow → FEM ($p < 0.05$), Hausman → REM ($p > 0.05$), LM → REM ($p < 0.05$), so REM is retained. The reported REM equation is: Firm Value_it = 3.499839 + 0.010811 FL_it − 0.045971 Size_it + 0.024766 ROA_it + 0.016750 GDP_t + e_it. (For panel-model selection practice, see Abrevaya & Hsu, 2021; Stata xtreg manual.)

Descriptive statistics and correlations are reported to gauge data character and initial multicollinearity indications. With all main-covariate pairwise $|r| < 0.80$, no multicollinearity is indicated and the data are suitable for regression. Assumption checks include normality (histogram & Jarque–Bera) and multicollinearity ($|r| < 0.80$; VIF/TOL). Normality holds (JB p = 0.587415); in REM, heteroskedasticity/autocorrelation are handled via GLS; thus, normality and multicollinearity receive emphasis. (Suteja et al., 2023.)

Significance is assessed with t-tests (partial) and F-tests (joint), and model fit via R^2/Adjusted R^2 for the selected panel model. The manuscript references EViews 13 outputs. (Suteja et al., 2023.).

4. RESULTS AND DISCUSSION

The sample contains 30 observations (10 issuers × 3 years) showing inter-firm heterogeneity and 2022–2024 macro dynamics. Descriptives indicate Firm Value ranges 2.296–3.887 (mean 3.177); Financial Leverage −2.640–0.287 (mean −1.026); Size 5.616–8.718 (mean 7.564); ROA −0.049–0.143 (mean 0.064); GDP 1.320–3.430 (mean 2.100). These suggest some loss-making firms (negative ROA minima) and relevant GDP volatility as business-cycle background. Correlations are all < 0.80—e.g., FL–Size = −0.625 (moderate, negative), FL–ROA = −0.334 (weak, negative), Size–GDP ≈ 0.002 (near zero), ROA–GDP = 0.151 (very weak)—so no multicollinearity concerns. (Context on Indonesia's post-pandemic sectoral performance: Thorbecke, 2024.)

Model selection proceeds sequentially: Chow → FEM ($p < 0.05$), Hausman → REM ($p > 0.05 = 1.000$), LM → REM ($p < 0.05$); thus REM is the final model. In this framework,

heteroskedasticity/autocorrelation are addressed by GLS, while diagnostics emphasize residual normality and covariate correlations. REM yields:

Firm Value_it = 3.499839 + 0.010811 FL_it − 0.045971 Size_it + 0.024766 ROA_it + 0.016750 GDP_t + e_it,

with significant constant (p = 0.0021), Adjusted R^2 = 0.068353 (≈6.83%), and a non-significant F-test (F = 1.531921; p = 0.223398). Partially, Financial Leverage (β = 0.010811; p = 0.7542), Size (β = −0.045971; p = 0.7339), and ROA (β = 0.024766; p = 0.9291) are not significant, whereas GDP is positive and significant (β = 0.016750; p = 0.0206). For comparison, CEM returns Adjusted R^2 = 0.218022, whereas FEM shows very high "Modified R^2" (0.995649), underscoring pronounced fixed entity-level heterogeneity. (On macro-financial links in Indonesia and emerging markets: Hsu et al., 2022; Keswani & Tiwari, 2024; Suriani et al., 2024.)

Substantively, the positive GDP–value association indicates the dominance of aggregate-demand and macro-sentiment channels in the automotive subsector during the 2022–2024 recovery; markets appear to anchor cash-flow expectations and risk assessments to national economic prospects. Conversely, the insignificance of leverage, size, and ROA suggests that over a short horizon with a limited covariate set, internal signals are not strong enough to explain valuation variation—consistent with a non-significant F-test—and aligns with trade-off theory's ambiguity on debt and with the notion that when macro uncertainty is salient, profitability signals may be discounted. Cross-model fit contrasts (CEM/FEM/REM) highlight strong firm fixed effects; thus, expanding specifications—e.g., adding controls (growth, tangibility, liquidity, governance) or using dynamic designs—could raise explanatory power in future work. (Pratt, 2023; Sudiyatno et al., 2020; Joseph & Abraham, 2024; Thorbecke, 2021, 2024.)

5. CONCLUSION AND IMPLICATIONS

This study concludes that GDP has a positive and significant effect on firm value among IDX Automotive & Allied Products issuers during 2022–2024 (β = 0.016750; p = 0.0206), while financial leverage, size, and ROA are not significant; jointly, the model is not significant (F = 1.531921; p = 0.223398) and has low explanatory power (Adjusted R^2 = 0.068353). Sequential panel-model selection via Chow–Hausman–LM points to the Random-Effects Model as the final specification. (Hsu et al., 2022; Thorbecke, 2024.)

Implications: management should align capital-structure, capex, and cash-management decisions with the macro cycle (top-down cues from growth indicators) because this

subsector's valuation is sensitive to aggregate conditions; leverage/scale expansion alone will not automatically raise value without strengthening cash-flow quality and cycle-resilience. For investors, results underscore timing and macro beta exposure when valuing automotive issuers. Limitations include N = 30 (10 firms × 3 years) and a narrow covariate set; future research could extend the horizon or use quarterly data, add controls (growth, tangibility, liquidity, governance), test dynamic/IV specifications for potential endogeneity, and conduct robustness checks (PBV vs ln-Tobin's Q; market leverage). (Diantimala, 2021; Jihadi et al., 2021; Suteja et al., 2023.)

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