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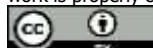
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EXAMINING THE DETERMINANTS OF FIRM VALUE IN INDONESIA'S CONSUMER CYCLICALS SECTOR: PANEL DATA EVIDENCE 2018–2022

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ABSTRACT

Objective: This study examines whether profitability (Return on Assets, ROA), leverage (Debt to Equity Ratio, DER), liquidity (Current Ratio, CR), and the market ratio (Earning per Share, EPS) are associated with firm value, measured by Price to Book Value (PBV), in consumer cyclicals companies listed on the Indonesia Stock Exchange (IDX) during 2018–2022.

Research Design & Methods: The study uses a quantitative, associative design with observational panel data: 35 companies selected by purposive sampling, giving a balanced panel of 175 firm-year observations. Chow, Hausman, and Lagrange Multiplier tests selected the Random Effect Model, which was estimated in EViews 10 and accompanied by classical assumption tests.

Findings: ROA ($p = 0.0001$) and DER ($p = 0.0039$) are positively and significantly associated with PBV, whereas CR ($p = 0.1708$) and EPS ($p = 0.8283$) are not. The four ratios are jointly significant (F-test $p < 0.001$; Adjusted R-square = 0.6888). The results are statistical associations, not causal effects.

Contributions: Earlier evidence on the ratios associated with firm value in Indonesia is mixed and comes mostly from manufacturing, property, and index-based samples. This study adds sector-specific evidence for consumer cyclicals, a sector exposed to the COVID-19 demand shock and its recovery. In this sample, ROA and DER were the only two of the four ratios significantly associated with PBV; investors and managers may consider them alongside other information.

Novelty: The study does not propose a new model. It provides a jointly estimated, specification-tested panel model for one sector over a period spanning pre-pandemic, pandemic, and recovery years. It does not formally test differences across sectors or periods, which is left for future research.

Keywords: Profitability, Leverage, Liquidity, Market Ratio, Firm Value

JEL codes: G01, G32, L21

Article type: research paper

INTRODUCTION

In early 2020, the world was disrupted by a novel disease named Coronavirus Disease-2019 (COVID-19), caused by a newly identified coronavirus. Because of its rapid and lethal spread, the World Health Organization (WHO) declared COVID-19 a global pandemic on 11 March 2020 and recommended social distancing measures, including in countries with no confirmed cases (Cucinotta & Vanelli, 2020). In line with this recommendation, the Indonesian government imposed large-scale social restrictions (PSBB) through Government Regulation No. 21 of 2020, issued on 31 March 2020. The implementation of PSBB reduced, and in some cases halted, companies' economic activities during the pandemic.

COVID-19 also increased stock-market volatility. Industry-level evidence from the United States shows that the pandemic raised volatility across sectors, with the size of the effect differing by industry (Baek et al., 2020). Consumer cyclicals companies produce and distribute secondary and tertiary goods and services and are therefore sensitive to macroeconomic conditions and household discretionary spending, which makes this sector a relevant setting for studying firm value under uncertainty. Figure 1 shows the sector index and trading volume for December 2020 to December 2022.

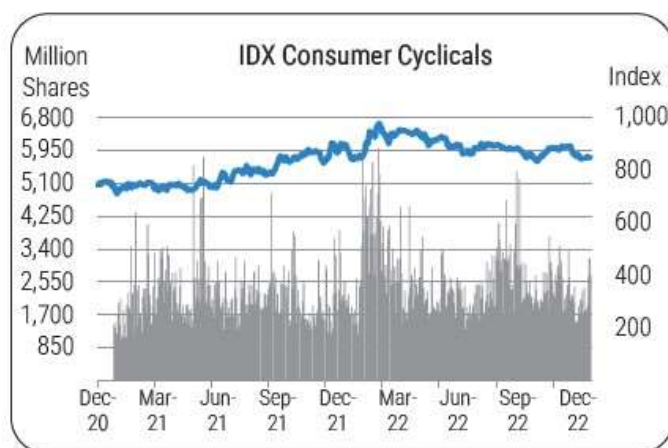


Figure 1. IDX Consumer Cyclical sectoral index (line, right axis, index points) and trading volume (bars, left axis, million shares), December 2020–December 2022. Source: Indonesia Stock Exchange (IDX)

As Figure 1 shows, the index started at roughly 750 points in December 2020, rose to about 850–900 points by the end of 2021, peaked at around 950 points in early 2022, and eased to roughly 850 points by December 2022 (values read from the chart). The plotted series begins in December 2020 and therefore does not display the March 2020 shock itself; that shock is illustrated below with firm-level financial statements, which are examples rather than a systematic sample. PT Matahari Department Store Tbk (LPPF), a well-known retail company, reported a net loss of about Rp873 billion in 2020 and temporarily closed nearly all of its outlets starting in March 2020, before returning to a net profit of about Rp913 billion in 2021. A similar pattern occurred at PT Astra Otoparts Tbk, an automotive spare-parts company, which booked a profit of Rp81 billion in 2019, a loss of Rp37 billion in 2020, and a profit of Rp63 billion in 2021. These examples illustrate a pandemic-year earnings shock followed by a recovery in some firms. They cannot by themselves establish sector-wide patterns, which is why this study analyzes all eligible firms in the sector.

Beginning in 2021, many institutions and companies resumed operations under mandatory health protocols, coinciding with a broader economic recovery. Several consumer cyclical firms rebounded, such as PT Ramayana Lestari Sentosa Tbk (RALS), whose operating loss of Rp254 billion in 2020 turned into an operating profit of Rp155 billion in 2021, and PT Media Nusantara Citra Tbk (MNCN), whose operating profit rose from Rp2,340 billion in 2020 to Rp3,438 billion in 2021. Share prices of some firms also rose: LPPF closed at Rp1,275 in 2020 and Rp4,150 in 2021, and PT Mahaka Media Tbk (ABBA) rose from Rp65 to Rp281. These firm-level movements are consistent with a recovery in the market valuation of some cyclical firms in 2021, but they are selected examples and do not identify investors' motives or a sector-wide shift in investor preferences.

Firm value is used as a basis for financial decisions that create value for investors (Brigham & Houston, 2015). The value perceived by investors is reflected in a company's share price, which also depicts the company's performance and worth. Firm value represents the price a buyer would be willing to pay if the company were to be sold (Dewi & Candradewi, 2018). Prospective investors use firm value as one basis for assessing a company's likely future performance. Firm value is considered important because it reflects company performance and can influence investor perceptions (Riyana et al., 2024); a higher firm value increases investor confidence in the company (Suwardika & Mustanda, 2017). Firm value can also be understood as the present value of expected future income or cash flows (Brigham & Houston, 2015).

Despite extensive prior research on the determinants of firm value in Indonesia, empirical findings on the relationships of profitability, leverage, liquidity, and market ratio with firm value remain inconsistent. Profitability and leverage have each been reported as both significant and non-significant in different samples (Saputri & Giovanni, 2021; Mahanani & Kartika, 2022; Farizki et al., 2021), and the same holds for liquidity and the market ratio (Wicaksono & Fitriati, 2022; Karin & Tanusdjaja, 2022). Three specific limitations of this literature motivate the present study. First, the samples are drawn from consumer-goods or food and beverage manufacturing (Saputri & Giovanni, 2021; Karin & Tanusdjaja, 2022; Hendrani & Septyanto, 2021), property (Suwardika & Mustanda, 2017), or the LQ-45 index (Arifianto & Chabachib, 2016), so evidence specific to consumer cyclical is scarce. Second, several of these studies cover pre-pandemic periods (for example 2014–2018 in Saputri and Giovanni (2021), and in Hendrani & Septyanto (2021), and 2011–2014 in Arifianto & Chabachib (2016), so it is unclear whether their estimates hold in a period containing the 2020 shock and the 2021–2022 recovery. Third, the studies differ in the control variables they include (for example firm size, asset structure, and growth), which makes their mixed results hard to compare. It is plausible that the relationships differ across sectors with different risk, cash-

flow, and demand characteristics. This study therefore re-estimates the four relationships jointly for one sector and one period; it does not formally test whether the relationships differ from those in other sectors or periods.

The consumer cyclicals sector warrants specific investigation for three reasons. First, demand for the secondary and tertiary goods and services this sector produces is closely tied to household discretionary spending, so firm performance and firm value are expected to be more sensitive to macroeconomic swings than in defensive sectors such as consumer staples or utilities. Second, as the firm-level examples above illustrate, some firms in the sector experienced a sharp profitability shock in 2020 followed by an uneven recovery through 2022, so relationships between financial ratios and firm value estimated only from pre-pandemic data may not hold under these more volatile conditions. Third, the capital structure and working-capital profile typical of cyclicals firms, including reliance on short-term financing for inventory and receivables, may alter how leverage and liquidity ratios relate to firm value relative to sectors with steadier cash flow. These sector-specific characteristics motivate re-examining the profitability, leverage, liquidity, and market-ratio relationships with firm value within this sector rather than relying on evidence drawn from other sectors.

The 2018–2022 observation window was chosen because it contains two pre-pandemic years (2018–2019) as a baseline, the pandemic year 2020, and the recovery years 2021–2022, so the panel spans the full shock-and-recovery cycle. Sector membership follows the IDX Industrial Classification (IDX-IC), in which consumer cyclicals is one of the sectors, as applied at the time of sampling (IDX, n.d.); the classification is therefore applied uniformly to all five years and is not the classification in force in each year.

Accordingly, this study examines the association of profitability (ROA), leverage (DER), liquidity (CR), and the market ratio (EPS) with firm value (PBV) in consumer cyclicals companies listed on the Indonesia Stock Exchange during 2018–2022. Because the data are observational, the results are interpreted as statistical associations, not causal effects. The contribution is empirical and modest in scope. Theoretically, the study provides sector-specific evidence that helps assess whether the mixed findings reported for other samples also appear in a sector exposed to a pronounced demand shock. Practically, it gives investors, company management, and future researchers evidence on which of the four ratios were significantly associated with firm value in this sector and period. It does not show that these ratios are the most informative indicators for investors, nor that the results extend to other sectors or periods.

LITERATURE REVIEW

Firm value is the price a buyer would be willing to pay if a company were to be sold (Thomas, 2011). It is an important indicator of company performance, since its magnitude can influence the investment decisions of prospective investors (Pohan et al., 2020). Firm value also reflects shareholder prosperity: the higher the firm value, the greater the prosperity of its shareholders, and vice versa. Companies must maintain their firm value to remain attractive to prospective investors. Optimal firm value can be achieved through effective and efficient financial management, since every financial decision a company makes contributes to increasing firm value. Firm value is reflected in share price — the higher the firm value, the higher the share price tends to be. Company performance can be observed through periodically published financial statements, which help investors assess a company's condition, growth, and development across periods.

Firm value can be measured using Price to Book Value (PBV), which compares a company's share price with its book value, functioning as a market ratio that measures the market performance of a share relative to its book value (Brigham & Houston, 2015). A high and rising PBV across periods attracts prospective investors. If the share price exceeds the book value, PBV rises, indicating a high firm value in the financial market. This study identifies the factors expected to affect firm value: profitability, proxied by Return on Assets (ROA); leverage, proxied by the Debt to Equity Ratio (DER); liquidity, proxied by the Current Ratio (CR); and the market ratio, proxied by Earning per Share (EPS).

The prior studies cited below differ in ways that may partly explain their divergent results: sector coverage (consumer-goods and food and beverage manufacturing, property, and LQ-45 firms), observation period (mostly before 2020), the control variables included (firm size, asset structure, growth), and the outcome measure. In particular, the studies on the market ratio by Veronica and Natalia (2022) and Budiarno and Prasetyoningrum (2021) use share price rather than PBV as the outcome, so their findings are not directly comparable with results for PBV. This study holds the sector, the period, and the outcome measure (PBV) constant and estimates the four ratios in one model, so that each ratio's association with firm value is estimated conditional on the others. Hypotheses are directional only where theory predicts an unambiguous sign (profitability); for leverage, liquidity, and the market ratio, the theories reviewed below predict opposite signs, and non-directional hypotheses are therefore used.

Profitability and Firm Value

Profitability describes a company's ability to generate profit from its assets or capital (Arifianto & Chabachib, 2016). High profitability indicates that a company can generate substantial profit from its assets or

capital, arising from sales and investment activities, and also reflects the quality of management performance. Profitability can be measured with ROA, calculated by dividing net income after tax by total assets. A higher ROA signals more effective company performance, which is a positive signal for investors and tends to raise share prices. Saputri and Giovanni (2021) found that profitability has a positive effect on firm value, whereas Mahanani and Kartika (2022) found that profitability has no effect on firm value. These mixed results can be explained through signaling theory (Brigham & Houston, 2015), which holds that under information asymmetry, management uses accounting information such as profitability to signal firm quality and future prospects to investors; a rising ROA functions as a credible positive signal that increases investor demand for shares and thereby raises share price and firm value, whereas the relationship weakens where profitability signals are noisy or overshadowed by other firm-specific risks. Because signaling theory predicts a positive sign and the mixed findings are explained by noise in the signal rather than by an opposite mechanism, a directional hypothesis is used: Ha1: Profitability (ROA) is positively associated with firm value.

Leverage and Firm Value

Leverage refers to a company's use of debt to finance its operations. According to Horne & Sinaga (1994), leverage concerns the use of funds for which a company pays a fixed cost, with the aim of increasing returns to shareholders. High returns can indicate high share prices, and vice versa, thereby affecting firm value. Excessive use of debt is considered unhealthy because liabilities exceed assets, raising company risk and making investors more cautious. Mahanani and Kartika (2022) found that leverage has a positive effect on firm value, whereas Farizki et al., (2021) found that leverage has no effect on firm value. Three theoretical perspectives, which do not all predict the same sign, help explain these mixed findings. Trade-off theory suggests that debt raises firm value up to an optimal point through the tax shield it provides, beyond which the marginal benefit is offset by rising financial distress and bankruptcy costs (Brigham & Houston, 2015). Signaling theory suggests that a firm's willingness to take on debt can signal management's confidence in future cash flows, but the signal is credible only if the firm can service its debt; in a cyclical sector with volatile cash flows, higher leverage raises fixed obligations and distress risk, and investors may read it as a warning rather than as a sign of confidence. Agency theory adds a third channel: debt can discipline managers by reducing the free cash flow under their control, which raises value in firms with few growth opportunities, whereas it can lower value in firms with growth opportunities through underinvestment (López-Iturriaga & Crisóstomo, 2010). Because these mechanisms operate in different directions and their relative strength depends on debt levels, growth opportunities, and cash-flow volatility, theory does not give an unambiguous sign for consumer cyclical firms. This study therefore tests a non-directional hypothesis: Ha2: Leverage (DER) is associated with firm value.

Liquidity and Firm Value

Liquidity is a company's ability to meet its short-term financial obligations using available funds, and is used as a ratio to measure company performance (Cahyani & Wirawati, 2019). The liquidity ratio reflects a company's ability to settle short-term obligations, or how quickly it can convert assets into cash (Sukamulja, 2022), and is important because it depicts short-term credit risk and the efficiency of short-term asset use. Higher liquidity indicates a greater ability to meet short-term obligations; management must maintain adequate liquidity because it supports effective profit generation, which in turn affects firm value. Liquidity is commonly measured using the Current Ratio (CR); a higher CR gives prospective investors a more positive perception. Wicaksono and Fitriati (2022) found that liquidity has no effect on firm value, whereas Mahanani and Kartika (2022) found that liquidity has a significant positive effect on firm value. These conflicting results reflect two competing theoretical views. Liquidity-preference and risk-signaling arguments suggest that higher liquidity reassures investors of a firm's ability to meet short-term obligations, which lowers perceived risk and can raise firm value. Conversely, the free cash flow perspective Brigham & Houston (2015) suggests that excessively high liquidity may signal idle cash that management fails to deploy productively, which can depress profitability and, in turn, firm value. The net effect of liquidity on firm value is thus an empirical question that depends on which of these two effects dominates in a given sector. Because the two views predict opposite signs, this study tests a non-directional hypothesis: Ha3: Liquidity (CR) is associated with firm value.

Market Ratio and Firm Value

The market ratio is used to assess the value of a share by taking into account net income, cash flow, and book value per share (Hery, 2018). It is important because it depicts the return per unit of investment relative to net income for a given period; a higher market ratio signals better future company prospects. Market ratios include dividend yield, dividend per share, earning per share, and price to book value (Ang, 1997), and are important for analyzing company performance and achievement (Fahmi, 2018). Veronica and Natalia (2022) found that the market ratio has a significant effect on share price, whereas Karin and Tanusdjaja (2022) found that the market ratio, proxied by EPS, has no significant effect on firm value. This inconsistency can also be explained through signaling theory: a rising EPS is conventionally interpreted as a signal of increasing returns available to shareholders, which should raise demand for shares and, in turn, firm value. However, the informativeness of this signal depends on investors' confidence that reported earnings will translate into distributable returns; when earnings are volatile,

negative, or not reflected in dividend policy, EPS may lose its signaling value and show little relationship with firm value. Because the signal may be informative or uninformative depending on earnings volatility and dividend policy, and prior results are mixed, this study tests a non-directional hypothesis: H_{a4} : The market ratio (EPS) is associated with firm value.

METHODS

Research Design

This study uses a quantitative, associative (explanatory) design with secondary, observational panel data. It examines whether the independent variables (X), namely profitability, leverage, liquidity, and the market ratio, are statistically associated with the dependent variable (Y), firm value (Sugiyono, 2019). Because the design involves no random assignment and no identification strategy for causal inference, the estimated coefficients are interpreted as conditional associations, not as causal effects. The dependent variable is firm value, and the independent variables are profitability (ROA), leverage (DER), liquidity (CR), and the market ratio (EPS).

Operational Definitions of Research Variables

This study uses one dependent variable and four independent variables, defined as follows.

Dependent Variable (Y) — Firm Value

The dependent variable is firm value, measured by Price to Book Value (PBV), following (Saputri & Giovanni, 2021). PBV compares the market price per share with the book value per share and measures the value the market assigns to a company as a growing enterprise (Brigham & Houston, 2015):

$$\begin{aligned} \text{PBV} &= \text{Share price per share} / \text{Book value per share} \\ \text{Book value per share} &= \text{Total equity} / \text{Number of shares outstanding} \end{aligned}$$

Independent Variables (X)

Profitability Ratio. Profitability is measured using Return on Assets (ROA). According to Brigham and Houston (2015):

$$\text{ROA} = \text{Net income after tax} / \text{Total assets}$$

Leverage Ratio. Leverage is measured using the Debt to Equity Ratio (DER). According to Kasmir (2019):

$$\text{DER} = \text{Total liabilities} / \text{Total equity}$$

Liquidity Ratio. Liquidity is measured using the Current Ratio (CR). According to Kasmir (2019):

$$\text{CR} = \text{Current assets} / \text{Current liabilities}$$

Market Ratio. The market ratio is measured using Earning per Share (EPS). According to Darmadji (2001):

$$\text{EPS} = \text{Net income} / \text{Number of shares outstanding}$$

Population and Sample

The population comprises all companies classified in the consumer cyclical sector of the IDX Industrial Classification (IDX-IC) and listed on the Indonesia Stock Exchange during 2018–2022; 129 companies were listed in this sector. The sample was determined by purposive sampling because the study requires complete, comparable financial and market data for every year of the panel. The criteria were: (1) the company published financial statements throughout the observation period, which yields a balanced panel; (2) the company did not report negative equity, because PBV and DER are not interpretable when equity is negative; and (3) the company provided the complete data required for all study variables. Thirty-five companies met all criteria, yielding a balanced panel of 175 firm-year observations (35 firms $\times$ 5 years). Because criterion (1) excludes firms listed after 2018 or delisted before 2022 and criterion (2) excludes firms with negative equity, the sample may under-represent the sector's most distressed firms (see Research Limitations).

Data Analysis Technique

Descriptive statistics were used to analyze and present quantitative data in order to describe the sampled companies, including maximum, minimum, mean, and standard deviation values (Ghozali, 2011). This study uses panel data regression analysis because the dataset combines a cross-section of 35 companies with a five-year time series (2018–2022), yielding 175 firm-year observations that vary both across firms and over time. Panel data regression is a suitable technique for this structure for three reasons: it increases the number of observations and degrees of freedom relative to a purely cross-sectional or purely time-series design, which improves the efficiency of the estimates; it allows the model to control for unobserved firm-specific characteristics that are constant over

time (such as management quality or business-model differences across the 35 sampled companies) and that could otherwise bias the estimated associations of ROA, DER, CR, and EPS with firm value; and it is better suited than a single-period cross-section to using the variation over time that arises from a shock such as the COVID-19 pandemic, although the specification does not include year effects (see Research Limitations). Because panel data can be estimated using the Common Effect Model (CEM), Fixed Effect Model (FEM), or Random Effect Model (REM), and each makes different assumptions about firm-specific heterogeneity, the Chow, Hausman, and Lagrange Multiplier tests below are used in sequence to determine which of the three specifications best fits this dataset before proceeding to hypothesis testing.

Model Specification Tests

Chow Test. The Chow test determines whether the Common Effect Model or the Fixed Effect Model is more appropriate. H_0 : Common Effect Model; H_a : Fixed Effect Model. H_0 is rejected if the p-value is smaller than the significance level of 5%; otherwise H_0 is accepted. If the Fixed Effect Model is selected, the Hausman test is performed next.

Hausman Test. The Hausman test compares the Fixed Effect Model with the Random Effect Model to determine the best model for the panel data regression (Porter & Gujarati, 2008). H_0 : Random Effect Model; H_a : Fixed Effect Model. H_0 is rejected if the p-value is smaller than 5%; if H_0 is rejected, the Fixed Effect Model is used, since the Random Effect Model may be correlated with one or more independent variables. Otherwise, the Random Effect Model is used.

Lagrange Multiplier Test. This test compares the Random Effect Model with the Common Effect Model (Widarjono, 2009). H_0 : Common Effect Model; H_a : Random Effect Model, evaluated at a 5% significance level.

Model Selection and Estimation

The three tests are applied in sequence. The Chow test compares the Common Effect and Fixed Effect Models; if the Fixed Effect Model is preferred, the Hausman test compares it with the Random Effect Model; the Lagrange Multiplier test then checks whether the Random Effect Model is preferable to the Common Effect Model. The Random Effect Model treats firm-specific intercepts as random draws that are uncorrelated with the regressors and is estimated by feasible generalized least squares (GLS) in EViews 10. Compared with the Fixed Effect Model, it uses both within-firm and between-firm variation and is more efficient when the Hausman test finds no systematic difference between the two estimators, but it is consistent only if the firm effects are uncorrelated with the regressors. Because the Hausman test has limited power in a short panel (35 firms, 5 years), the choice of the Random Effect Model is interpreted with caution.

Classical Assumption Tests and Standard Errors

Residual normality is assessed with the Jarque-Bera test; multicollinearity with variance inflation factors (VIF below 10 indicates no problem); heteroskedasticity with the Glejser test, which regresses the absolute residuals on the independent variables; and first-order autocorrelation with the Durbin-Watson statistic. The Glejser test is a screening procedure, and the Durbin-Watson statistic is a time-series diagnostic with limited power to detect serial correlation in a panel with only five periods per firm. The reported standard errors are the conventional Random Effect Model (GLS) standard errors; standard errors that are robust to heteroskedasticity and to serial correlation within firms (clustered by firm) are not reported, and this is noted as a limitation. Because the model is estimated by GLS, the reported R-squared and Adjusted R-squared refer to the transformed (weighted) model and indicate fit in that model, not the share of the raw variance in PBV that is explained.

Hypothesis Testing

Partial regression tests (t-tests) were conducted to examine whether profitability, leverage, liquidity, and the market ratio are individually associated with firm value at the 5% significance level (95% confidence level). The reported probabilities are two-tailed. H_{a1} is supported only if the ROA coefficient is positive and significant, whereas H_{a2} – H_{a4} , which are non-directional, are supported if the corresponding coefficient is statistically significant, whatever its sign. The F-test was used to determine whether the independent variables are jointly associated with the dependent variable, and the Adjusted R-square was used to assess the explanatory power of the model.

RESULT

Model Specification Test Results

Chow Test

The Chow test is used to choose between the Fixed Effect Model and the Common Effect Model. The results are presented in Table 1.

Table 1. Chow Test Results (Common Effect vs. Fixed Effect Model)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	10.568095	(34,136)	0.0000
Cross-section Chi-square	226.194408	34	0.0000

The Chow test is conducted first to determine whether pooling the data (Common Effect Model) is adequate or whether firm-specific intercepts (Fixed Effect Model) are needed. Based on Table 1, the cross-section probability is 0.0000, which is smaller than 0.05, so H_0 (Common Effect Model) is rejected in favor of H_a (Fixed Effect Model). Because the Fixed Effect Model is indicated at this stage, the Hausman test is conducted next to determine whether the Fixed Effect Model or the Random Effect Model is more appropriate.

Hausman Test

The Hausman test compares the Fixed Effect Model with the Random Effect Model. The results are presented in Table 2.

Table 2. Hausman Test Results (Fixed Effect vs. Random Effect Model)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.158922	4	0.1876

Based on Table 2, the cross-section random probability is 0.1876, which is greater than 0.05, so H_0 (Random Effect Model) cannot be rejected in favor of H_a (Fixed Effect Model). The Random Effect Model is therefore preferred over the Fixed Effect Model. As an additional robustness check, the Lagrange Multiplier test is then used to confirm that the Random Effect Model is also preferable to the simpler Common Effect Model, since the Hausman test alone does not rule out the possibility that pooling the data would be adequate.

Lagrange Multiplier Test

The Lagrange Multiplier test compares the Random Effect Model with the Common Effect Model (Widarjono, 2009). The results are presented in Table 3.

Table 3. Lagrange Multiplier Test Results (Common Effect vs. Random Effect Model)

Null (no rand. effect) / Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	132.7775 (0.0000)	0.742490 (0.3889)	133.5200 (0.0000)
Honda	11.52291 (0.0000)	-0.861678 (0.8056)	7.538630 (0.0000)
King-Wu	11.52291 (0.0000)	-0.861678 (0.8056)	2.923460 (0.0017)
GHM	--	--	132.7775 (0.0000)

The Breusch-Pagan cross-section probability of 0.0000 is smaller than 0.05, so H_0 (Common Effect Model) is rejected in favor of H_a (Random Effect Model). This result is consistent with the Hausman test above: both tests point to the Random Effect Model as the most appropriate specification for this panel, and it is therefore the model used for the subsequent classical assumption tests and hypothesis testing.

Classical Assumption Test Results

Normality Test

The normality test determines whether the residuals of the regression model are normally distributed, using the Jarque-Bera (JB) statistic compared against the Chi-Square table value. If the probability is greater than or equal to 5%, the data are normally distributed. The result is shown in Figure 2.

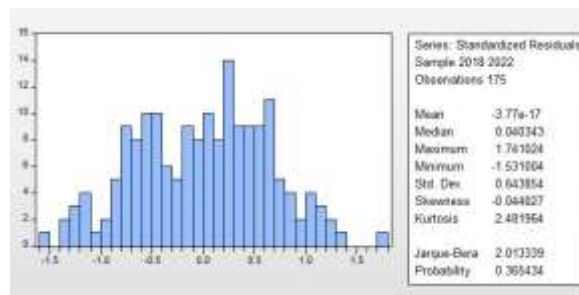


Figure 2. Normality Test Results

Figure 2 shows a Jarque-Bera probability of 0.365434, which is greater than 0.05, so the null hypothesis of normally distributed residuals is not rejected. This test concerns the model's residuals (its prediction errors), not the distribution of each variable. The descriptive statistics (Table 7) show that several variables, particularly EPS (skewness 4.10, kurtosis 24.06), are strongly skewed and heavy-tailed at the raw-variable level; the normality assumption applies to the error term, not to the raw variables. The residual result supports the use of the t- and F-tests, but the extreme EPS values suggest that outliers may influence the estimates, and no outlier treatment or robustness check was applied (see Research Limitations).

Autocorrelation Test

The autocorrelation test determines whether the regression model's error term in period t is correlated with the error term in period $t-1$, using the Durbin-Watson (DW) test at a 5% significance level. The results are presented in Table 4.

Table 4. Random Effect Model Summary Statistics, Including the Durbin-Watson Statistic

Statistic	Value	Statistic	Value
R-squared	0.756743	Mean dependent var	-0.721368
Adjusted R-squared	0.688774	S.D. dependent var	0.684043
S.E. of regression	0.381611	Akaike info criterion	1.104755
Sum squared resid	19.80529	Schwarz criterion	1.810050
Log likelihood	-57.66602	Hannan-Quinn criter.	1.390842
F-statistic	11.13368	Durbin-Watson stat	1.817563
Prob(F-statistic)	0.000000		

Table 4 shows a Durbin-Watson statistic of 1.817563. Comparing this value with the Durbin-Watson table ($n = 175$, $k = 4$), $dU = 1.7996$, $dL = 1.7062$, $4-dU = 2.2004$, and $4-dL = 2.2938$. Since $dU < d < 4-dU$ ($1.7996 < 1.817563 < 2.2004$), the test does not indicate first-order autocorrelation. Because the Durbin-Watson critical values were designed for time series and the panel has only five periods per firm, this result is treated as indicative only.

Heteroskedasticity Test

The heteroskedasticity test examines whether the variance of the residuals is constant across observations. If the variance is constant, the model is homoskedastic; if not, it is heteroskedastic (Ghozali, 2011). This study uses the Glejser test, where a significance value below 5% indicates heteroskedasticity. The results are presented in Table 5.

Table 5. Heteroskedasticity Test Results (Glejser Test)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.386998	0.053756	7.199177	0.0000
ROA	0.038212	0.023209	1.646466	0.1015
DER	-0.091413	0.052944	-1.726586	0.0861
CR	-0.063146	0.044098	-1.431966	0.1540
EPS	-0.003762	0.002658	-1.415587	0.1587

Table 5 shows probability values of 0.1015 (ROA), 0.0861 (DER), 0.1540 (CR), and 0.1587 (EPS), all above 0.05, so the Glejser test does not indicate heteroskedasticity at the 5% level. The probability for DER (0.0861) is, however, below 0.10, so mild heteroskedasticity related to leverage cannot be ruled out, and heteroskedasticity-robust standard errors would be a useful robustness check.

Multicollinearity Test

The multicollinearity test examines whether correlation exists among independent variables, based on the Variance Inflation Factor (VIF). A VIF below 10 indicates no multicollinearity. The results are presented in Table 6.

Table 6. Multicollinearity Test Results (Variance Inflation Factors)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.027090	2.983988	NA
ROA	0.001852	1.149064	1.111973
DER	0.018733	1.888599	1.068464
CR	0.012720	1.782555	1.035561
EPS	0.0000517	1.159661	1.131820

Table 6 shows centered VIF values of 1.111973 (ROA), 1.068464 (DER), 1.035561 (CR), and 1.131820 (EPS), all far below 10; the uncentered VIF values (1.149064 to 1.888599) are also below 10. The regressors therefore do not show a multicollinearity problem.

Descriptive Statistics

Descriptive statistics describe the data in terms of mean, standard deviation, variance, maximum, minimum, sum, range, kurtosis, and skewness (Ghozali, 2011). The statistics for the study variables (N = 175) are presented in Table 7.

Table 7. Descriptive Statistics of the Study Variables (N = 175)

Statistic	ROA	DER	CR	EPS	PBV
Mean	0.4264	0.630437	0.730171	2.211691	0.606651
Median	0.4900	0.490000	0.550000	0.141000	0.539000
Maximum	5.4800	2.370000	2.200000	60.44400	3.232000
Minimum	-1.9900	0.080000	0.120000	-22.47700	0.100000
Std. Dev.	0.964683	0.444470	0.520708	9.076538	0.424705
Skewness	1.335506	1.244809	0.697521	4.101365	2.033086
Kurtosis	8.467175	4.402016	2.419369	24.05856	10.82366
Jarque-Bera	269.9689	59.52807	16.64886	3724.202	566.8793
Probability	0.000000	0.000000	0.000243	0.000000	0.000000
Sum	74.62000	110.3264	127.7800	387.0460	106.1640
Sum Sq. Dev.	161.9268	34.37439	47.17789	14334.74	31.38512
Observations	175	175	175	175	175

Multiple Linear Regression Results

Multiple linear regression with the Random Effect Model was used to examine the association of the independent variables with the dependent variable, using Eviews 10. The estimates are presented in Table 8.

Table 8. Random Effect Model Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.930134	0.114260	-8.140500	0.0000
ROA	0.224311	0.055028	4.076304	0.0001
DER	0.336859	0.115170	2.924898	0.0039
CR	-0.132173	0.096099	-1.375394	0.1708
EPS	-0.001239	0.005703	-0.217172	0.8283

Based on Table 8, the regression equation is:

$$PBV = -0.930134 + 0.224311 ROA + 0.336859 DER - 0.132173 CR - 0.001239 EPS + e$$

Partial Test Results (t-test)

Profitability and Firm Value (Ha1)

The profitability variable has a t-statistic of 4.076304 with a probability of 0.0001, which is below 0.05. ROA is therefore positively and significantly associated with firm value; H01 is rejected and Ha1 is supported.

Leverage and Firm Value (Ha2)

The leverage variable has a t-statistic of 2.924898 with a probability of 0.0039, which is below 0.05. DER is therefore significantly associated with firm value, and the coefficient is positive; H02 is rejected and Ha2 is supported.

Liquidity and Firm Value (Ha3)

The liquidity variable has a t-statistic of -1.375394 with a probability of 0.1708, which is above 0.05. CR is therefore not significantly associated with firm value; H03 is not rejected and Ha3 is not supported.

Market Ratio and Firm Value (Ha4)

The market ratio variable has a t-statistic of -0.217172 with a probability of 0.8283, which is above 0.05. EPS is therefore not significantly associated with firm value; H04 is not rejected and Ha4 is not supported.

Simultaneous Test (F-test)

The F-test determines whether all independent variables are jointly associated with the dependent variable. The F-statistic is 11.13369 with a probability of 0.0000. Since the F-statistic exceeds the F-table value ($11.13369 > 2.42389$) and the probability is below 0.05, profitability, leverage, liquidity, and the market ratio are jointly and significantly associated with firm value in the consumer cyclical sector on the Indonesia Stock Exchange.

Coefficient of Determination (R^2)

The coefficient of determination indicates how well the independent variables explain the dependent variable, ranging from 0 to 1; a value closer to 1 indicates greater explanatory power (Ghozali, 2011). The Adjusted R-square is 0.688774, so profitability, leverage, liquidity, and the market ratio jointly account for 68.88% of the variation in firm value in the estimated (GLS-transformed) model, while the remaining 31.12% is associated with other variables not examined in this study.

DISCUSSION

Profitability and Firm Value (Ha1)

The ROA coefficient of 0.224311 ($t = 4.076304$, $p = 0.0001$) shows a positive and significant association between profitability and firm value in consumer cyclical companies listed on the IDX during 2018–2022, which supports Ha1: firm-years with higher ROA tend to have higher PBV. This pattern is consistent with signaling theory, in which higher profitability is read as a favorable signal of management performance and future prospects that can raise demand for a firm's shares. The result agrees with Saputri and Giovanni (2021), who found that higher profitability is associated with higher firm value because it signals improved performance and favorable prospects; with Lamba and Atahau (2022), who found that high profitability signals good prospects and attracts investor demand; with Hendrani and Septyanto (2021), who found a positive and significant relationship among food and beverage manufacturers; and with Karin and Tanusdjaja (2022), who found that ROA has a positive and significant partial effect on firm value. It differs from Mahanani and Kartika (2022), who found no relationship. One possible, untested interpretation is that in a sector whose sales and profits swing with the macroeconomic cycle, sustaining a positive ROA through the 2020–2021 downturn may have been a comparatively informative signal of resilience. The study does not observe investor behavior or compare sectors, so this remains a conjecture, and the design cannot show that profitability causes higher valuation.

Leverage and Firm Value (Ha2)

The DER coefficient of 0.336859 ($t = 2.924898$, $p = 0.0039$) shows a positive and significant association between leverage and firm value, so Ha2, which is non-directional, is supported and the sign is positive. This is consistent with the signaling view that debt can signal management's confidence in future cash flows. It also agrees with Lamba and Atahau (2022), who found that leverage is positively related to firm value and that a higher debt level need not harm firm value when assets are financed mainly through retained earnings, and with Jonnardi (2020), who also found a positive and significant relationship. It contrasts with López-Iturriaga and Crisóstomo (2010), who found in Brazilian firms that leverage lowers the value of firms with growth opportunities (underinvestment) but raises the value of firms without growth opportunities, consistent with the disciplining role of debt over free cash flow. It also differs from Farizki et al. (2021), who found no relationship. Two considerations qualify the signaling interpretation. First, the positive association may partly reflect how the ratios are constructed: PBV divides market price by book equity per share and DER divides liabilities by book equity, so firms with low book equity tend to show both high DER and high PBV. Second, a positive association does not show that investors read debt as a positive signal, because the study does not observe investor beliefs. A sector-specific explanation is also plausible but untested: consumer cyclical firms often use debt to finance inventory and outlet expansion, and the average DER in the sample (0.63) is well below levels typically associated with financial distress, so within this range higher leverage may coincide with expansion during the recovery years. Whether the association persists at

higher leverage, where the distress risk emphasized by trade-off theory becomes relevant, cannot be assessed with the linear specification used here.

Liquidity and Firm Value (Ha3)

The CR coefficient of -0.132173 ($t = -1.375394$, $p = 0.1708$) indicates no significant association between liquidity and firm value, so Ha3 is not supported. This is consistent with [Wicaksono and Fitriati \(2022\)](#), who found no relationship, but it differs from [Saputri and Giovanni \(2021\)](#), who found a negative effect and argued that excessively high liquidity can indicate idle cash that reduces profitability, and from [Mahanani and Kartika \(2022\)](#), who found a significant positive effect and argued that high liquidity reassures investors about a firm's ability to meet short-term obligations. The absence of a significant association is compatible with the argument of [Karin and Tanusdjaja \(2022\)](#) that investors may give CR little weight because current assets may be dominated by receivables and inventory that are not readily convertible to cash; in this sample, 66% of observations had a CR below 1. A further possibility is that CR mixes a genuine liquidity signal with slow-moving inventory accumulated during the demand shock, so that opposing influences offset one another. This study lacks data on the composition of current assets and cannot test this interpretation, which should be treated as speculative.

Market Ratio and Firm Value (Ha4)

The EPS coefficient of -0.001239 ($t = -0.217172$, $p = 0.8283$) indicates no significant association between the market ratio and firm value, so Ha4 is not supported. [Karin and Tanusdjaja \(2022\)](#) likewise reported no significant effect of EPS on firm value and argued that EPS cannot reliably predict share price, partly because some companies do not distribute dividends or capital gains when their performance declines; in this sample, 38% of observations had negative EPS. The finding contrasts with [Budiarno and Prasetyoningrum \(2021\)](#), who found a positive effect of EPS on the share prices of Islamic-compliant stocks; because their outcome is share price rather than PBV, the comparison is indirect. One possible explanation is the earnings volatility of the sector in the sample period, illustrated by LPPF's swing from a net loss of about Rp873 billion in 2020 to a net profit of about Rp913 billion in 2021 and by Astra Otoparts' move from profit to loss and back to profit within three years: a single year's EPS may reflect the timing of pandemic disruption more than underlying earning power. The study does not observe how investors weighed EPS against other information, so this explanation is a conjecture.

Joint Association and Explanatory Power

The Adjusted R-square of 0.688774 indicates that profitability, leverage, liquidity, and the market ratio jointly account for 68.88% of the variation in firm value in the GLS-transformed model, while 31.12% is associated with other variables outside this study. The significant F-statistic (probability 0.0000) shows that the four ratios are jointly associated with firm value in the consumer cyclical sector on the IDX during 2018–2022. Taken together with the individual tests, this joint result is driven by ROA and DER: Ha1 and Ha2 are supported, whereas Ha3 and Ha4 are not.

Research Limitations

This study has several limitations. First, it covers a five-year period (2018–2022) for the consumer cyclical sector on the IDX, and only 35 of the 129 listed companies in the sector met the sampling criteria, so the results may not represent the whole sector or market. Second, the design is observational and the model includes only four financial ratios; other potentially relevant determinants of firm value (firm size, sales growth, dividend policy, ownership structure, and corporate governance) and unobserved shocks are not included, and 31.12% of the variation remains unexplained, so the coefficients are associations that may be affected by omitted variables and reverse causality. Third, the model has no year effects, so the coefficients pool the pre-pandemic, pandemic, and recovery years and cannot show whether the relationships changed across these phases; the positive leverage association in particular may be specific to this crisis-and-recovery context. Fourth, the reported standard errors are the conventional Random Effect Model (GLS) standard errors; the Glejser probability for DER is 0.0861, the Durbin-Watson statistic has limited power in a five-period panel, and standard errors clustered by firm were not estimated, so the reported significance levels may be overstated if residuals are correlated within firms. Fifth, several variables, particularly EPS, are strongly skewed with extreme values, and no outlier treatment (for example winsorization) or alternative specification was applied; the Adjusted R-square refers to the GLS-transformed model. Sixth, PBV and DER share book equity in their denominators, which may link them mechanically. Seventh, the purposive sampling criteria, which excluded firms with negative equity or incomplete data, may have introduced survivorship bias by omitting some of the most severely affected companies. Future research is encouraged to (a) add year effects or pandemic-period indicators and test whether the coefficients differ before, during, and after the pandemic; (b) report firm-clustered or otherwise robust standard errors and compare fixed effects and random effects estimates; (c) add size, solvency, activity, growth, and governance variables; (d) compare consumer cyclical with other sectors in an interaction or multi-sector panel to test whether the relationships are sector-specific; and (e) consider non-linear or threshold specifications for leverage and liquidity.

CONCLUSION

This study examined whether profitability (ROA), leverage (DER), liquidity (CR), and the market ratio (EPS) are associated with firm value (PBV) in consumer cyclical companies listed on the IDX during 2018–2022, using a balanced panel of 35 firms (175 firm-year observations) and a Random Effect Model. ROA and DER were positively and significantly associated with PBV (Ha1 and Ha2 supported), whereas CR and EPS were not significantly associated with PBV (Ha3 and Ha4 not supported). The four ratios were jointly and significantly associated with PBV, with an Adjusted R-square of 0.6888 in the GLS-transformed model. Because the data are observational, these findings describe statistical associations, not causal effects. Theoretically, the positive ROA association agrees with signaling theory. The positive DER association agrees with the signaling and disciplining views, but it may also reflect the shared book-equity denominator of PBV and DER, it cannot show that investors read debt as a positive signal, and the linear specification cannot assess the distress-risk mechanism of trade-off theory. The results add sector-specific evidence to a literature with mixed findings; because only one sector and one period were studied, the study cannot say whether the mixed findings in earlier work are due to differences in sector or period. In practical terms, profitability and leverage moved together with firm value in this sample, whereas short-term liquidity and single-year EPS showed no significant association once the other ratios were taken into account. These results should not be read as showing that ROA and DER are more informative than CR and EPS for investors, because that would require comparisons of incremental explanatory or predictive power that were not conducted.

Based on these findings and the limitations above, investors analyzing consumer cyclical companies may consider ROA and DER alongside other information, recognizing that the associations do not establish that a change in these ratios will change firm value. Company management may note that firm value was positively associated with profitability in this sample; the positive association with leverage should not be read as advice to increase debt, given the distress risk of cyclical earnings and the limits of the linear specification. Future researchers are advised to add or replace the variables that showed no significant association with other variables, such as solvency and activity ratios, company size, and governance indicators, to model the pandemic phases explicitly, to use robust standard errors, and to extend the analysis to other sectors and more recent periods to test the generalizability of these findings.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no financial, personal, or professional conflicts of interest that could have influenced the research, authorship, or publication of this manuscript.

RESEARCH ETHICS STATEMENT

This study uses secondary data from established, publicly available databases. The research does not involve direct interaction with human participants, interviews, surveys, experiments, or collecting personally identifiable information. Therefore, the study does not involve human-subject research requiring informed consent. All data were used solely for academic and research purposes and were analysed in accordance with applicable ethical standards and the terms of access and use of the respective data sources.

AI USAGE STATEMENT

Generative artificial intelligence (AI) tools were utilized exclusively to support the language editing process, including grammatical correction, sentence refinement, and enhancement of the manuscript's clarity, coherence, and readability. AI tools were not employed to generate research data, perform statistical analyses, or independently develop the study's findings and conclusions. OpenAI ChatGPT (version 5.2) was used by the author solely as a language-editing and writing-support tool. All AI-assisted outputs were carefully reviewed, verified, and subsequently revised by the author to ensure their accuracy, appropriateness, and alignment with the research content prior to manuscript submission.

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