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Effects of Capital Structure, Operating Cash Flow, and Firm Size on Financial Distress in Retailing Companies Listed on the IDX

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Abstract

This study examines the effects of capital structure, operating cash flow, and firm size on financial distress among retailing sub-sector companies listed on the Indonesia Stock Exchange (IDX) during 2020–2025. A quantitative approach was applied using secondary data from financial statements. The population comprised 32 companies, and purposive sampling yielded 22 companies with 132 observations. The data were analyzed using descriptive statistics, classical assumption tests, multiple linear regression, t-tests, an F-test, and the coefficient of determination, with IBM SPSS Statistics version 22. The results show that capital structure has a negative and significant effect on financial distress (coefficient = -0.206 ; $p = 0.000$), operating cash flow has a positive and significant effect (coefficient = 1.219 ; $p = 0.000$), and firm size has a negative and significant effect (coefficient = -1.231 ; $p = 0.017$). Simultaneously, the three independent variables significantly affect financial distress ($F = 23.430$; $p = 0.000$). The final model yields an R^2 of 0.425 and an adjusted R^2 of 0.407. These findings highlight the importance of financing decisions, operating cash flow management, and asset scale in controlling the risk of financial distress in retailing companies.

Keywords: *capital structure; operating cash flow; firm size; financial distress; retailing*

I. INTRODUCTION

Indonesia, as a developing economy in Southeast Asia, has shown resilience in the face of global challenges such as the COVID-19 pandemic, commodity price volatility, and global economic uncertainty (Nafilla & Juliana, 2021). These conditions have affected various business sectors, including the retailing industry, which plays an important role in the national economy. The retailing industry has been changing along with shifts in consumption patterns and technological development. According to Statistics Indonesia (BPS), the wholesale and retail trade sector contributes more than 13% of gross domestic product (BPS, 2024).

Changes in economic conditions and the business environment can pressure a company's ability to sustain its financial performance. One condition that deserves attention is financial distress, a state of financial difficulty that may be an early stage before bankruptcy. A commonly used indicator for predicting financial distress is the Altman Z"-Score model, which combines several financial ratios to identify firms experiencing financial difficulty (Altman, 2000). A lower Z"-Score indicates a higher risk of financial distress (Arini, 2021).

To describe financial distress in retailing sub-sector companies listed on the IDX, this study uses data for 2020–2025. Fig. 1 presents the development of the average Altman Z"-Score.

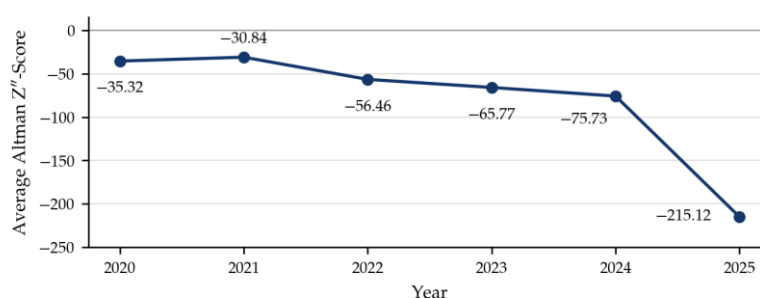


Fig. 1. Average financial distress (Altman Z"-Score) of retailing companies, 2020–2025

Source: IDX secondary data, 2020–2025

As Fig. 1 shows, average financial distress worsened over 2020–2025. The average Z"-Score was -35.32 in 2020, improved slightly to -30.84 in 2021, and then deteriorated to -56.46 in 2022, -65.77 in 2023, and -75.73 in 2024. The most alarming condition occurred in 2025, when the average fell sharply to -215.12, indicating a rising risk of financial difficulty in the retailing sub-sector.

The high level of distress in 2020 relates to the impact of the COVID-19 pandemic, which slowed economic activity, reduced sales, disrupted supply chains, and weakened purchasing power. In 2021 the average improved as economic activity began to recover and household consumption increased (Bank Indonesia, 2023). However, the improvement was not sustained, which suggests that firms continued to face pressure on profitability and liquidity even as the economy recovered. The deterioration in 2024 may relate to weaker financial performance and rising expenses and obligations (Supriadi et al., 2022). The sharp decline in 2025 is associated with weakening purchasing power, rising operating costs, competition from e-commerce platforms, and a reduced capacity to maintain financial performance and meet obligations.

This pattern reveals a phenomenon gap: the recovery of economic activity has not been fully matched by an improvement in the financial condition of retailing sub-sector companies. Although conditions improved in 2021, they worsened again during 2022–2025. This suggests that financial distress is shaped not only by external economic conditions but also by internal company factors.

Capital structure is one such factor because it reflects the proportion of debt used to finance a company. A capital structure that is not managed optimally can increase financial burdens and the risk of financial difficulty. Darmiasih et al. (2022) found that capital structure has a positive effect on financial distress, while Rahayu and Rahmawati (2025), studying retail companies, reported that capital structure significantly affects

financial distress. These results indicate that the use of debt is an important aspect in assessing the risk of financial distress.

Operating cash flow is also important because it shows a company's ability to generate cash from operations to finance its activities and meet its obligations. Low or negative operating cash flow may indicate pressure on the company's ability to sustain its operations. Darmiasih et al. (2022) found that operating cash flow has a negative effect on financial distress, whereas Bachtiar and Handayani (2022) found a positive effect. This difference in direction reveals an inconsistency in prior findings on the relationship between operating cash flow and financial distress.

Another factor is firm size, which describes the scale of a company's economic resources and is proxied in this study by the natural logarithm of total assets. In theory, firms with greater resources are better able to withstand economic pressure and sustain their business. However, large assets do not automatically protect a firm from financial distress if those assets are not managed effectively. Salim and Dillak (2021) found that firm size and capital structure significantly affect financial distress, while Rahayu and Rahmawati (2025) found that firm size has a significant negative effect on financial distress.

Based on this prior research, a research gap remains regarding the effects of capital structure, operating cash flow, and firm size on financial distress. The studies by Darmiasih et al. (2022), Rahayu and Rahmawati (2025), Salim and Dillak (2021), and Bachtiar and Handayani (2022) differ in the direction and significance of the relationships examined. They also differ in their research objects, observation periods, and combinations of variables.

Given this phenomenon gap and research gap, this study examines the effects of capital structure, operating cash flow, and firm size on financial distress in retailing sub-sector companies listed on the IDX during 2020–2025. The study is expected to provide empirical evidence on the internal factors associated with financial distress and to inform companies and investors in anticipating the risk of financial difficulty.

II. LITERATURE REVIEW

A. Signaling Theory

Signaling theory was first introduced by Spence (1973) and explains that parties with more information can convey it to external parties as a signal about a firm's condition and prospects. Management holds more complete information about the company's internal condition than investors and creditors do; therefore, the information in financial statements can serve as a signal of the firm's condition and prospects to outsiders. In this study, signaling theory is used to explain the relationship between operating cash flow and financial distress. Positive and stable operating cash flow signals that the company can generate cash from its main activities, meet its financial obligations, and sustain its operations. Conversely, low or negative operating cash flow may signal operational problems and a higher risk of financial distress. Operating cash flow information can thus serve as an indicator for external parties in assessing a firm's financial health.

B. Trade-Off Theory

Trade-off theory explains that firms must determine an optimal level of debt by weighing its benefits against its costs. Debt provides benefits such as tax savings (the tax shield), but excessive debt can raise the costs of financial distress, the risk of default, and the burden of obligations (Myers, 1984). In this study, trade-off theory is used to explain the relationship between capital structure and financial distress. Capital structure, measured by the debt-to-equity ratio (DER), shows the proportion of debt relative to equity. The more debt a firm uses, the greater its obligation to pay interest and principal. If the increase in debt is not matched by adequate profit and cash flow, financial pressure may rise and lead to financial distress.

C. Resource-Based Theory

Resource-based theory holds that the resources a firm owns are a foundation of its ability to sustain its advantage and continuity. Firms with greater resources generally have broader capacity to cope with business-environment pressure, obtain funding, and expand their operations. In this study, the theory is used

to explain the relationship between firm size and financial distress. Firm size is proxied by the natural logarithm of total assets (Ln Total Assets), which reflects the economic resources owned by the firm. Firms with larger assets theoretically have more resources and flexibility in facing financial pressure. However, large assets do not automatically free a firm from financial distress if those resources are not managed effectively.

D. Financial Distress

Financial distress is a decline in a firm's financial ability to meet its obligations before it reaches bankruptcy. It deserves attention because it can be an early sign of deteriorating financial health. In this study, financial distress is proxied by the Altman Z"-Score. The Altman model combines several financial ratios to distinguish healthy firms from those in financial difficulty (Altman, 2000). A higher Z"-Score indicates healthier finances and a lower risk of financial distress, whereas a lower score indicates a higher risk. Because financial distress is the dependent variable describing the financial health of retailing sub-sector companies, changes in the Z"-Score show the level of distress risk during the observation period. The formula used is:

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (1)$$

E. Capital Structure

Capital structure is the composition of a firm's funding from debt and equity. Debt can be a source of funds for expansion, but it increases payment obligations and financial risk. According to trade-off theory, firms seek an optimal capital structure by balancing the benefits of debt against the costs of financial distress. In this study, capital structure is proxied by the debt-to-equity ratio (DER), the ratio of total debt to total equity. A higher DER indicates a larger share of debt financing relative to equity, which can raise financial burdens and, under certain conditions, increase the risk of financial distress (Minanari et al., 2024). The formula used is:

$$DER = \text{Total Debt} / \text{Total Equity} \quad (2)$$

F. Operating Cash Flow

Operating cash flow is the cash generated from a firm's main operating activities and reflects its ability to generate cash from core business activities on a sustained basis. Sugiana and Hidayat (2023) explain that operating cash flow describes the quality of operating performance and the ability to maintain business continuity. For retailing companies, it is especially important because their core activities involve sales, inventory purchases, supplier payments, and various operating expenses. Stable operating cash flow shows that the company can generate cash from its main activities, whereas low or negative operating cash flow may indicate pressure on its ability to meet operating needs and obligations. The formula used is:

$$OCF = \text{Operating Cash Flow} / \text{Current Liabilities} \quad (3)$$

G. Firm Size

Firm size describes how large or small a company is in terms of the resources it owns. Total assets are a common indicator because they reflect the scale of a firm's economic resources. In this study, firm size is measured as Ln Total Assets. Larger firms generally have more resources and greater flexibility in coping with economic change and business competition. In retailing, firm size may also reflect the ability to sustain business activity under environmental pressure. However, a large firm is not automatically free of financial distress, because effective resource management remains important (Heniwati & Essen, 2020). The formula used is:

$$\text{Firm Size} = \ln(\text{Total Assets}) \quad (4)$$

III. METHOD

This study uses a quantitative methodology to examine how capital structure, operating cash flow, and firm size affect financial distress in retailing sub-sector companies listed on the IDX during 2020–2025. A quantitative approach is used because the data are numerical and are analyzed with statistical methods to test relationships and effects among variables (Sugiyono, 2020). The population consists of 32 retailing sub-sector companies listed on the IDX during 2020–2025. Samples were selected by purposive sampling based on certain

criteria, yielding 22 companies with a total of 132 firm-year observations. The data are secondary data in the form of the annual financial statements of retailing sub-sector companies listed on the IDX.

The dependent variable is financial distress (Y), measured by the Altman Z'-Score. The independent variables are capital structure (X1), proxied by the debt-to-equity ratio (DER); operating cash flow (X2), measured from cash flows from operating activities; and firm size (X3), proxied by the natural logarithm of total assets (Ln Total Assets). To ensure objective and consistent measurement, the operational definition of each variable follows indicators suited to its characteristics. Financial statement data for the study period were collected through documentation, and the data were processed and analyzed with Statistical Product and Service Solutions (SPSS) version 22.

The data analysis methods comprise descriptive statistics, multiple linear regression to determine the effect of the independent variables on the dependent variable, and classical assumption tests covering normality, multicollinearity, heteroscedasticity, and autocorrelation. Descriptive statistics describe the data through the minimum, maximum, mean, and standard deviation (Sugiyono, 2019). Hypotheses were tested using the partial test (t-test), the simultaneous test (F-test), and the coefficient of determination (R^2) to determine the effect of each independent variable, their joint effect, and the model's ability to explain the dependent variable (Ghozali, 2018). A significance level of 0.05 is used as the basis for decisions in hypothesis testing.

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics

Table I presents the descriptive statistics for the 132 observations drawn from the financial and annual reports of retailing sub-sector companies listed on the IDX during 2020–2025. Capital structure, proxied by the debt-to-equity ratio (DER), has a minimum of -1.03 , a maximum of 190.31 , a mean of 2.7559 , and a standard deviation of 16.64588 . A standard deviation larger than the mean indicates relatively high variation in capital structure across companies. Operating cash flow has a minimum of -23.51 , a maximum of 3.88 , a mean of -0.0072 , and a standard deviation of 2.64185 . A mean close to zero and slightly negative suggests that the operating cash flow of the sample firms is relatively low, with considerable dispersion across companies. Firm size has a minimum of 21.86 , a maximum of 31.99 , a mean of 28.2523 , and a standard deviation of 2.05790 ; a standard deviation much smaller than the mean indicates that firm size varies relatively little and is fairly homogeneous. Financial distress has a minimum of $-4,274.46$, a maximum of 159.28 , a mean of -79.8743 , and a standard deviation of 422.04944 . The negative mean shows that financial distress values in the sample are generally negative, while the very large standard deviation indicates very high variation across companies.

TABLE I. DESCRIPTIVE STATISTICS

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Capital structure (DER)	132	-1.03	190.31	2.7559	16.64588
Operating cash flow	132	-23.51	3.88	-0.0072	2.64185
Firm size (Ln Total Assets)	132	21.86	31.99	28.2523	2.05790
Financial distress (Z'-Score)	132	$-4,274.46$	159.28	-79.8743	422.04944
Valid N (listwise)	132				

Source: SPSS 22 output (data processed by the authors, 2026)

B. Classical Assumption Tests

Normality. The Kolmogorov-Smirnov test on the unstandardized residuals produced an asymptotic significance of 0.000 (< 0.05), so the data were not normally distributed (Table II). The variables were therefore transformed with the square root (SQRT) function. After the transformation, the asymptotic significance was 0.200 (> 0.05), indicating that the residuals were normally distributed; the normality assumption was thus

met. The residual histogram is bell-shaped and follows the normal curve (Fig. 2a), and the points in the normal P-P plot lie around the diagonal line (Fig. 2b). Both support the normality of the residuals.

TABLE II. ONE-SAMPLE KOLMOGOROV-SMIRNOV TEST

Statistic	Before transformation	After SQRT transformation
N	132	99
Normal parameters: mean	0.0000000	0.0000000
Normal parameters: std. deviation	357.28412835	0.63607048
Most extreme differences: absolute	0.201	0.063
Most extreme differences: positive	0.154	0.063
Most extreme differences: negative	-0.201	-0.058
Test statistic	0.201	0.063
Asymp. Sig. (2-tailed)	0.000	0.200

Dependent variable: unstandardized residual. Test distribution is normal; calculated from data; Lilliefors significance correction. Source: SPSS 22 output (data processed by the authors, 2026)

Multicollinearity. All independent variables have VIF values below 10 and tolerance values above 0.10 (Table III). Capital structure has a tolerance of 0.974 and a VIF of 1.026, operating cash flow 0.998 and 1.002, and firm size 0.973 and 1.028. The regression model therefore shows no symptoms of multicollinearity, and the independent variables can be used in the regression analysis.

TABLE III. REGRESSION COEFFICIENTS AND COLLINEARITY STATISTICS

Variable	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	8.216	2.706		3.036	0.003		
Capital structure (X1)	-0.206	0.046	-0.352	-4.472	0.000	0.974	1.026
Operating cash flow (X2)	1.219	0.187	0.508	6.531	0.000	0.998	1.002
Firm size (X3)	-1.231	0.506	-0.192	-2.434	0.017	0.973	1.028

Dependent variable: SQRT_Y (square-root-transformed Altman Z"-Score); all variables are square-root transformed. Source: SPSS 22 output (data processed by the authors, 2026)

Heteroscedasticity. The Glejser test gave a significance of 0.318 (> 0.05) for operating cash flow, but 0.026 for capital structure and 0.004 for firm size, both below 0.05, indicating that the model still exhibited heteroscedasticity (Table IV). The Spearman rank correlation test gave the same indication: operating cash flow and firm size have significance values below 0.05, whereas capital structure is above 0.05. Because some independent variables still had significance values below 0.05, the scatterplot was examined. The points of the studentized residuals against the standardized predicted values are scattered randomly and form no clear pattern, such as a funnel, widening, or wavy shape (Fig. 2c). It was therefore concluded that heteroscedasticity does not occur and that the assumption is met.

TABLE IV. HETEROSCEDASTICITY TESTS

Variable	Glejser test		Spearman rank test	
	t	Sig.	Correlation (ρ)	Sig. (2-tailed)
Capital structure (X1)	2.269	0.026	0.075	0.460
Operating cash flow (X2)	1.003	0.318	-0.248	0.013
Firm size (X3)	-2.986	0.004	-0.235	0.019

Dependent variable: ABS_RES2 (absolute residual); N = 99. Source: SPSS 22 output (data processed by the authors, 2026)

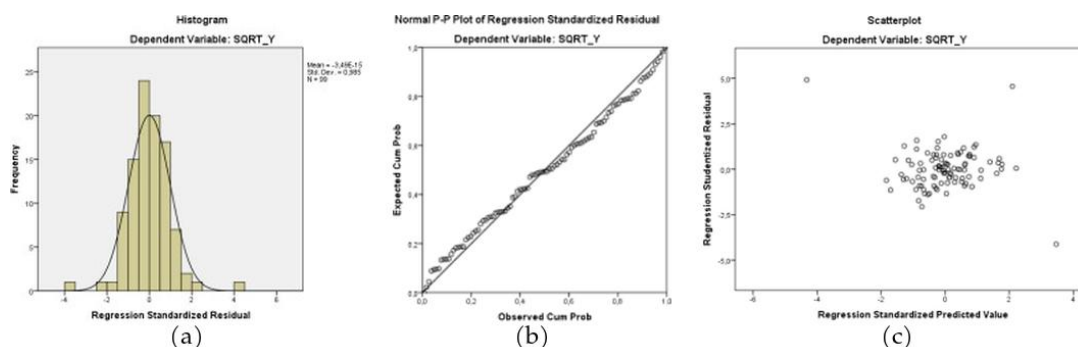


Fig. 2. Residual diagnostics: (a) histogram, (b) normal P-P plot, and (c) scatterplot

Source: SPSS 22 output (data processed by the authors, 2026)

Autocorrelation. The Durbin–Watson (DW) statistic is 1.691, with $n = 99$ and $k = 3$ independent variables, giving $dU = 1.735$. Under the decision criterion $dU < DW < 4 - dU$ ($1.735 > 1.691 < 2.265$), the model shows autocorrelation (Table V). The runs test was therefore applied; its asymptotic significance of 0.000 (< 0.05) shows that the residuals are not random, so autocorrelation still appears to be present. The Breusch–Godfrey (BG) test was then conducted as a further check: the significance for LAGS(RES_2,1) is 0.129 (> 0.05), so it is concluded that the model has no autocorrelation.

TABLE V. AUTOCORRELATION TESTS

Test	Statistic	Criterion / Sig.	Conclusion
Durbin–Watson	DW = 1.691	$dU = 1.735$; $4 - dU = 2.265$	Autocorrelation
Runs test	$Z = -4.141$	Sig. = 0.000 (< 0.05)	Autocorrelation
Breusch–Godfrey	$t = 1.533$	Sig. = 0.129 (> 0.05)	No autocorrelation

Runs test: test value (median) = -0.00944; cases $<$ test value = 49; cases $\geq$ test value = 50; total cases = 99; number of runs = 30. Source: SPSS 22 output (data processed by the authors, 2026)

C. Multiple Linear Regression Analysis

Based on Table III, the resulting regression equation is:

$$\hat{Y} = 8.216 - 0.206X_1 + 1.219X_2 - 1.231X_3 \quad (5)$$

where Y is the Altman Z'' -Score, X_1 is capital structure, X_2 is operating cash flow, and X_3 is firm size. The constant of 8.216 means that if capital structure, operating cash flow, and firm size are zero (constant), the predicted Altman Z'' -Score is 8.216. The coefficient of -0.206 for capital structure means that each 1% increase in capital structure lowers the Altman Z'' -Score by 0.206, assuming operating cash flow and firm size are held constant. The coefficient of 1.219 for operating cash flow means that each 1% increase raises the Altman Z'' -Score by 1.219, assuming capital structure and firm size are held constant. The coefficient of -1.231 for firm size means that each 1% increase lowers the Altman Z'' -Score by 1.231, assuming capital structure and

operating cash flow are held constant. Finally, the combined coefficient of -0.218 means that if capital structure, operating cash flow, and firm size all increase by 1% simultaneously, financial distress as measured by the Altman Z"-Score falls by 0.218; conversely, a simultaneous 1% decrease raises it by 0.218.

D. Hypothesis Testing

Partial test (t-test). Capital structure has a t-value of -4.472 , against a t-table value of 1.985, and a significance of $0.000 < 0.05$. H1 is therefore accepted: capital structure has a negative and significant effect on financial distress. Operating cash flow has a t-value of 6.531 (t-table 1.985) and a significance of $0.000 < 0.05$, so H2 is accepted: operating cash flow has a positive and significant effect on financial distress. Firm size has a t-value of -2.434 (t-table 1.985) and a significance of $0.017 < 0.05$, so H3 is accepted: firm size has a negative and significant effect on financial distress.

Simultaneous test (F-test). The model feasibility test (Table VI) yields an F-value of 23.430 with a significance of $0.000 (< 0.05)$. Capital structure, operating cash flow, and firm size therefore jointly affect financial distress, and the regression model is feasible and able to explain the relationship between the independent and dependent variables.

Coefficient of determination. The adjusted R^2 is 0.407, which means that capital structure, operating cash flow, and firm size together explain 40.7% of the variation in financial distress. The remaining 59.3% is influenced by other factors not examined in this study.

TABLE VI. MODEL SUMMARY AND F-TEST

R	R ²	Adjusted R ²	Std. error of the estimate	F	Sig. (F)
0.652	0.425	0.407	0.64604	23.430	0.000

Predictors: (constant), SQRT_X3, SQRT_X2, SQRT_X1; dependent variable: SQRT_Y; Durbin-Watson = 1.691. ANOVA: regression SS = 29.336 (df = 3), residual SS = 39.649 (df = 95), total SS = 68.986 (df = 98); mean square = 9.779 (regression) and 0.417 (residual). Source: SPSS 22 output (data processed by the authors, 2026)

E. Discussion

Effect of capital structure on financial distress. The results show that capital structure has a negative and significant effect on financial distress (Sig. $0.000 < 0.05$). In theory, a greater use of debt can increase the burden of obligations and the risk of financial distress if it is not matched by the firm's ability to generate profit and cash flow (Myers, 1984). This finding is consistent with Darmiasih et al. (2022), Salim and Dillak (2021), and Adriani (2025), who found that capital structure affects financial distress. It shows that managing the proportion of debt and equity is an important aspect of maintaining a company's financial stability.

Effect of operating cash flow on financial distress. The results show that operating cash flow has a positive and significant effect on financial distress (Sig. $0.000 < 0.05$). In theory, a firm's ability to generate cash flow from operating activities can serve as a signal of its financial condition and stability (Spence, 1973). This finding is consistent with Arrasyi and Hapsari (2025), Miswaty and Novitasari (2023), and Adriani (2025), who found that operating cash flow affects financial distress. It shows that the ability to generate operating cash flow helps a company meet its obligations and sustain its business.

Effect of firm size on financial distress. The results show that firm size has a negative and significant effect on financial distress (Sig. $0.017 < 0.05$). In theory, firms with greater resources potentially cope better with financial pressure, although the benefit depends on how effectively those resources are managed (Barney, 1991). This finding is consistent with Darmiasih et al. (2022), Masruroh and Purnamawati (2025), Rahmah and Akbar (2025), and Adriani (2025), who found that firm size affects financial distress. It shows that a large asset base needs to be matched by effective resource management.

Simultaneous effect. The results show that capital structure, operating cash flow, and firm size jointly have a significant effect on financial distress (Sig. $0.000 < 0.05$). Financial distress is therefore shaped not by a single factor but by a combination of financing decisions, the ability to generate cash flow, and the resources a firm

owns. Optimal management of all three factors is needed to maintain financial stability and minimize the risk of financial distress.

V. CONCLUSIONS

Based on the results of this study on the effects of capital structure, operating cash flow, and firm size on financial distress in retailing sub-sector companies listed on the IDX during 2020–2025, the following conclusions are drawn. (1) Capital structure, proxied by the debt-to-equity ratio (DER), has a negative and significant effect on financial distress. (2) Operating cash flow has a positive and significant effect on financial distress. (3) Firm size, proxied by Ln Total Assets, has a negative and significant effect on financial distress. (4) Capital structure, operating cash flow, and firm size jointly have a significant effect on financial distress.

Several suggestions follow from these findings. First, companies are advised to manage their capital structure optimally by keeping the use of debt proportionate, to improve their ability to generate operating cash flow, and to manage their assets efficiently, so as to minimize the risk of financial distress and maintain operational continuity. Second, investors can take capital structure, operating cash flow, and firm size into account as indicators when assessing the risk of financial distress in retailing sub-sector companies listed on the IDX. Third, future researchers are advised to add other variables that may affect financial distress, such as profitability, liquidity, sales growth, good corporate governance, or macroeconomic variables, as well as to extend the research object to other sectors and lengthen the observation period in order to obtain more comprehensive and accurate results.

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