

Do Working Capital Efficiency and Capital Structure Shape Financial Distress? The Moderating Role of Firm Size in Food and Beverage Firms Listed on the Indonesia Stock Exchange

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Article History

Received: 12-06-2026

Revised: 16-06-2026

Published: 30-06-2026

Keywords: Cash Conversion Cycle, Debt to Equity Ratio, financial distress, Firm size, Altman Emerging Market Score

ABSTRACT

This study examines Cash Conversion Cycle (CCC) and Debt to Equity Ratio (DER) as determinants of financial distress, with firm size tested as a moderating variable, among Food and Beverage companies on the IDX during 2021–2025. Financial distress is operationalized through the Altman Emerging Market Score (EMS), estimated via a Fixed Effect Model with clustered standard errors using panel data from 63 companies yielding 315 observations. Rising CCC is found to significantly worsen financial distress, while DER exhibits a similar but statistically weak tendency. Firm size fails to moderate either relationship. Substituting Debt to Asset Ratio as an alternative leverage proxy confirms that asset-based leverage significantly deteriorates financial distress, reinforcing the robustness of the main findings.

INTRODUCTION

Dynamics post-pandemic global economy Still marked by slowdown economy, inflation, financial market uncertainty, volatility price food and energy , disturbances chain supply, as well as risk geopolitics that put pressure on emerging market countries and developing economies (World Bank, 2026). Pressure the can creeping to Indonesia via mark exchange, fees material raw materials, energy, distribution, and financing. Bank Indonesia (2024) also emphasized that tension geopolitics potential bother chain supply, driving up food and energy prices, and hampering the process of reducing inflation globally. In situation said, the ability company in guard liquidity, efficiency operational and structure funding become the more important.

Food and Beverage Company become relevant objects Because is in a close sector with need base society, but still prone to to pressure costs . Based on the IDX Industrial Classification, Food and Beverage is included in classification Consumer Non-Cyclicals or Primary Consumer Goods, which includes group business like beverages, processed foods, and agricultural products (Indonesia Stock Exchange, 2021). Although request to product primary consumption tends to more stable, company in sector This still face risk from

increase price material raw materials, energy, packaging, distribution, financing, and changes Power buy. Condition the can squeeze margins and increase risk financial distress when No supported with management adequate finances.

Financial distress refers to the condition Where health finance company start weaken before reach stage bankruptcy or liquidation. Conditions This can seen from weakening liquidity, increasing debt burden, decline profitability, limited access funding, and difficulties fulfil obligation finance appropriate time (Kebede et al., 2024). Detection early financial distress important Because can help management, investors and creditors, as well as stakeholders interest in evaluate sustainability company (Kristanti et al., 2025). Measurement financial distress in studies This using the Altman Emerging Market Score because assessed in accordance For emerging market context such as Indonesia. The use of the Altman model in industry Food and Beverage Indonesia has also conducted by Hamzah and Annisa (2022).

Internally , financial distress can influenced by working capital management and capital structure. The proxies used For working capital management is the Cash Conversion Cycle (CCC), namely indicators that reflect duration of Company funds being held in cycle operation through inventory , receivables , and payments to suppliers. CCC which is too long can pressing cash flow and increase risk finance company . Karim et al. (2024) showed that CCC relevant used For evaluate efficiency working capital management, whereas Andoko and Santana (2025) link CCC with risk bankruptcy using the Altman Z-Score. In addition, the capital structure is proxied with Debt to Equity Ratio (DER) because describe proportion use of debt against equity. The use of debt can support activity effort , but excessive leverage tall can increase interest burden, pressure liquidity, as well as potential fail pay (Kebede et al., 2024).

Connection CCC and DER against financial distress can also influenced by size company. Firm size can become factor differentiator Because company scale more big in general outperform small companies in matter assets, access funding, reputation credit , and capacity more operational strong. With Thus, the size company potential strengthen or weaken influence working capital management and capital structure towards financial distress. Kebede et al. (2024) found that size company related close with condition health finance, while Purohit et al. (2025) placed firm size as variables moderation in studies financial distress.

Previous research has not provided consistent results regarding the relationship between working capital, capital structure, firm size, and financial distress. These inconsistent findings indicate that the effects of CCC and DER on financial distress may vary by sector, macroeconomic conditions, observation period, and firm characteristics. Hamzah and Annisa (2022) conducted a study in the Food and Beverage industry on financial distress, but only covered the 2018–2019 period. On the other hand, Andoko and Santana (2025) explored the impact of CCC on bankruptcy risk in manufacturing companies during the 2019–2023 period. Therefore, the purpose of this study is to analyze the impact of working capital efficiency and

capital structure on financial distress in Food and Beverage issuers in the Non-Cyclical Consumer sector of the Indonesian Stock Exchange (IDX) for the 2021–2025 period, with firm size as a moderating variable.

In a way conceptual, more CCC long show that company funds longer held up in cycle operation, so that estimated can lower health finance company. Higher DER height is also estimated can pressing condition finance Because reflect a deeper reliance on debt-based funding. Conversely, larger companies tend to have a greater advantage in asset ownership, access to funding and capacity more operational strong, so that firm size estimated can weaken impact negative CCC and DER to health finance company.

Based on description said , the hypothesis study formulated as following:

- H1: Cash Conversion Cycle has an effect negative against the Altman Emerging Market Score.
- H2: Debt to Equity Ratio influential negative against the Altman Emerging Market Score.
- H3: Firm size weaken influence negative Cash Conversion Cycle against the Altman Emerging Market Score.
- H4: Firm size weaken influence negative Debt to Equity Ratio against the Altman Emerging Market Score.

RESEARCH METHODS

Type of Research, Data, Data Sources , Population , and Sample

This study applies a quantitative, associative-causal approach to examine the influence of working capital management and capital structure on financial distress, while also assessing the role of firm size as a moderating variable. The data used is panel data from Food and Beverage companies listed on the Indonesia Stock Exchange for the 2021–2025 period. The 2020 data remains the basis for initial calculations, particularly to obtain the average account for the 2021 Cash Conversion Cycle calculation. The use of panel data allows the analysis to examine not only differences in characteristics between companies but also changes in financial condition throughout the study period (Wooldridge, 2010; Baltagi, 2021).

The study population comprised issuers in the Consumer Non-Cyclicals sector on the Indonesia Stock Exchange. The sample was selected using purposive sampling, with the criteria being that the companies were in the Food and Beverages group , published complete annual financial reports, and had the necessary financial accounts for variable calculations. Based on the IDX Industrial Classification, the Food and Beverages group falls within the Consumer Non-Cyclicals sector, which includes beverages, processed foods, and agricultural products (Indonesia Stock Exchange, 2021). After selection, 63 companies were selected over a five-year period, resulting in a total of 315 company-year observations.

Table 1. Selection sample study

Sample Criteria	Amount
Sector companies <i>Consumer Non-Cyclicals</i> on the Indonesia Stock Exchange	132 companies
Companies included group <i>Food and Beverage</i>	102 companies
<i>Food and Beverage</i> Companies that meet criteria sample	63 companies
Period observation	5 years
Total panel observations	315 observations

Data Collection and Processing Techniques

The research data comes from annual company financial reports publicly available on the Indonesia Stock Exchange. Data collection was conducted using Python to search and compile financial reports, filter relevant files, compile company-year inventories, and assist with initial data processing. Furthermore, the identification of financial accounts used in the research was conducted through manual verification of each company's PDF financial report. Manual verification was conducted to ensure the accounts conformed to the operational definitions of variables, reporting units, currencies, and values used in the calculation of the research variables. After the selected raw data were compiled and normalized, the final dataset was processed using Stata for descriptive analysis, panel regression estimation, moderation testing, and robustness checks.

Definition Operational Variables

Study This put financial distress as variables dependent whose measurement refers to the Altman Emerging Market Score. The Altman model is used Because capable integrate a number of ratio finance that represents liquidity, accumulation profit, profitability, and structure capital company (Altman, 1968; Altman, 2005; Altman et al., 2017). Altman Emerging Market Score used Because study This focuses on companies in Indonesia which include in category emerging market. In addition, the object study covers company Food and Beverage that is not all of it move as manufacturing pure, so that EMS is assessed more in accordance For describe condition finance company. The use of the Altman model in study financial distress to industry Food and Beverage Indonesia has also used by Hamzah and Annisa (2022), as well in line with development prediction financial distress in emerging markets (Kristanti et al., 2025). With Thus, EMS is expected capable give description health finance company in a way more comprehensive compared to size financial distress which only based on one ratio finance.

The more tall EMS value , the more Good condition finance something company , then If low EMS value indicates risk greater financial distress big . With Thus, the coefficient positive to EMS is interpreted as improvement health finance or decline risk distress, whereas coefficient negative show decline health finance or improvement risk distress. Cut-off lowered from constants and zone limits of the Altman Emerging Market Score model

(Altman, 2005; Altman et al., 2017), namely distress zone if $EMS < 4.35$, grey zone if $4.35 \leq EMS \leq 5.85$, and safe zone if $EMS > 5.85$.

Cash Conversion Cycle used as proxy working capital management Because reflect company fund duration stuck in cycle operations . At the company Food and Beverage, CCC relevant Because activity business is closely related with management inventory, receivables business, accounts payable, sales, and expenses main sales . CCC has Lots used in working capital research Because reflect efficiency company in change activity operational into cash (Deloof, 2003; Karim et al., 2024; Johan et al., 2024). Meanwhile that, DER is used as proxy capital structure because represent level dependence company against debt compared equity. Excessive leverage tall can increase burden finance, pressure liquidity, as well as potential fail pay , so that relevant in study financial distress (Kebede et al., 2024; Kristanti et al., 2025). Measurement Firm size use natural logarithm (Ln) of total assets Because size company reflect capacity source power, access funding, reputation credit, and power stand operational. Use firm size as variables Moderation is also supported by Purohit et al. (2025).

Table 2. Definitions operational variables

Variables	Proxy	Formula	Information
Financial distress	Altman Emerging Market Score	$EMS = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$	$X_1 = \text{Working Capital} / \text{Total Assets}$; $X_2 = \text{Retained Earnings} / \text{Total Assets}$; $X_3 = \text{EBIT} / \text{Total Assets}$; $X_4 = \text{Book Value Equity} / \text{Total Liabilities}$
Working Capital Management	Cash Conversion Cycle	$CCC = DIO + DSO - DPO$	$DIO = (\text{Average Inventory} / \text{Cost of Goods Sold}) \times 365$; $DSO = (\text{Average Accounts Receivable} / \text{Sales}) \times 365$; $DPO = (\text{Average Accounts Payable} / \text{Cost of Goods Sold}) \times 365$
Capital Structure	Debt to Equity Ratio	$DER = \frac{\text{Total Liabilities}}{\text{Total Equity}}$	Describe proportion of debt to equity
Firm size	Company Size	$SIZE = \ln(\text{Total Assets})$	Used as variables moderation
Sales Growth	Growth Sale	$GROWTH = \frac{(\text{Sales}_{it} - \text{Sales}_{it-1})}{\text{Sales}_{it-1}}$	Used as variables control
Year Effect	Dummy Year	Dummy 2022–2025	Used For catch difference condition interperiod

Data Analysis Models and Techniques

Regression models were constructed to test the direct and moderating effects. The baseline model was used to examine the impact of working capital management and capital structure on financial distress:

$$EMS_{it} = \alpha + \beta_1 CCC_{it} + \beta_2 DER_{it} + \beta_3 SGROWTH_{it} + \gamma YEAR_{it} + \varepsilon_{it}$$

Next, the moderation model used For test whether firm size strengthen or weaken the influence of CCC and DER on financial distress:

$$EMS_{it} = \alpha + \beta_1 CCC_{it} + \beta_2 DER_{it} + \beta_3 SIZE_{it} + \beta_4 CCC_SIZE_{it} + \beta_5 DER_SIZE_{it} + \beta_6 SGROWTH_{it} + \gamma YEAR_{it} + \varepsilon_{it}$$

In the research model , the symbol i refers to the company unit, whereas t show year observation. The CCC_SIZE variable is formed from CCC interaction with firm size, while DER_SIZE is formed from DER interaction with firm size . Effect moderation tested through coefficient interaction. The coefficient β_4 indicates whether firm size change influence working capital management in financial distress, while β_5 indicates whether firm size change influence capital structure in financial distress. Before variables interaction entered to In the model, CCC, DER, and SIZE are mean- centered so that the potential multicollinearity between variables main and interaction can reduced.

Panel data estimation is run with compare three approach , namely Fixed Effect Model, Common Effect Model, and Random Effect Model . Selecting the best model refers to the Hausman test, Chow test, and Lagrange Multiplier test . The procedure This help ensure the estimation model in accordance with characteristics of panel data (Hausman, 1978; Wooldridge, 2010; Baltagi, 2021). If there is heteroscedasticity or panel correlation, estimation use robust standard errors or clustered standard errors at the firm level.

Robustness check and Treatment Outlier

Testing robustness used For see whether results main study still consistent moment size variables certain replaced. At this stage this , proxy original capital structure refers to the Debt to Equity Ratio (DER) diverted to Debt to Asset Ratio (DAR). DAR is used as size alternative leverage Because ratio This reflect how much big portion asset companies financed by liabilities. If DER assesses structure funding through comparison of total liabilities with equity, then DAR sees it from comparison of total liabilities to total assets . With corner view said, DAR can complete evaluation to structure funding company (Astuti & Dewi, 2024). The DAR formula is presented as following:

$$DAR = \text{Total Liabilities} / \text{Total Assets}$$

Second , EMS is changed become variables dummy distress based on Altman Emerging Market Score cut-off. In testing this company with $EMS < 4.35$ is categorized as distress and given value 1, whereas company in grey zone and safe zone categorized as non-distress and given value 0. As testing additional, observation grey zone can issued for comparison only done between distress zone and safe zone. Because the variables dependent shaped dummy, testing done use regression logistics or logit panel. For reduce influence outliers, variables main such as EMS, CCC, DER, DAR, SIZE, and SGROWTH are winsorized at the 1st and 99th percentiles (Lian, 2014). Observation only issued if there is data errors that are not can verified through report finance company.

RESULTS AND DISCUSSION

Research data panel -shaped and sourced from issuer Food and Beverage listed on the Indonesia Stock Exchange in 2021–2025. After the selection process , the final dataset covering 63 companies in range five- year observation, total data analyzed totaling 315 company-years. Research panel including strongly balanced Because all over company have complete data on each year observation. Examination results the beginning also shows that No There is data duplication in pairs company and year, and No found missing value in variable main study.

Before done estimate regression, variables The main winsorized at the 1st and 99th percentiles for reduce influence mark extreme. Treatment This No delete observation, but limit mark extreme so as not to dominate results estimation. The variables used in regression main are EMS, CCC, DER, size company, sales growth, and variables interaction between CCC and size company as well as DER and size company. CCC, DER, and size variables company moreover formerly done mean- centering before formation variables interaction.

Table 3. Statistics descriptive study after winsorize

Variables	N	Mean	Std. Dev.	Minimum	Maximum
EMS	315	9,1044	4,9201	-4,7491	23,4909
CCC	315	28,6183	85,5691	-202,0173	439,4439
DER	315	1,2173	1.9818	-2.9554	13,5511
DAR	315	0.4892	0.3126	0.0847	2,3011
<i>Firm size</i>	315	28,7418	1,7616	24,9393	32,8264
<i>Sales growth</i>	315	0.1582	0.4679	-0.8324	3,1635

Source: Stata output processed, 2026.

Based on Table 3, the average value of EMS after winsorize is 9.1044 with standard deviation 4.9201. The average value is above the safe zone limit of the Altman Emerging Market Score, in matter This part big company in sample classified as own condition Maintained financial condition. Average CCC is 28.6183 days show that company funds stuck in cycle operation about 29 days . However, the relative dispersion of CCC wide reflect non-uniformity in working capital management intercompany. DER has an average of 1.2173, which indicates that average total liabilities of the company beyond magnitude equity owned . DAR has an average of 0.4892, which means approximately 48.92% of assets company financed by liabilities. Firm size has an average of 28.7418, while sales growth has an average of 0.1582 or around 15.82%.

Minimum and maximum values a number of variables , especially CCC, DER, DAR, and sales growth, indicate existence characteristics extreme in some company. This is can happen Because difference condition finance company, equity negative, liabilities that exceed assets, or surge huge sales in the year certain. Therefore that, winsorize used For guard

stability results estimate without remove observations that are still can explained in a way economy.

Table 4. Distribution of Altman emerging market score zones

EMS Zone	Frequency	Percentage
<i>Distress</i>	52	16.51%
<i>Grey</i>	15	4.76%
<i>Safe</i>	248	78.73%
Total	315	100.00%

Source: Stata output processed, 2026.

The EMS zone classification shows that 52 observations or 16.51% are in the distress zone, 15 observations or 4.76% are in the gray zone, and 248 observations or 78.73% are in the safe zone. This distribution indicates that most of the Food and Beverage companies in the sample are in a safe condition according to the Altman Emerging Market Score approach. However, the presence of 16.51% of observations in the distress zone still indicates that there are groups of companies facing serious financial pressure during the study period. The EMS zone classification in this study refers to the logic of the Altman Emerging Market Score model, namely that a higher EMS value indicates an improving financial condition, while a lower value indicates increasing exposure to the risk of financial distress. The use of the Altman-based model is still relevant because it combines several dimensions of a company's financial health, such as liquidity, profitability, accumulated profits, and capital structure (Altman, 2005; Altman et al., 2017; Braunsberger & Aschauer, 2025). In the context of the food sector and emerging markets, the use of the Altman Z-Score EMS is also in line with Sánchez-Almeyda et al. (2025) who used the model to identify distress, gray, and safe zones in food production companies. Furthermore, the use of the Altman model in Indonesian food and beverage companies has also been carried out by Hamzah and Annisa (2022), so this approach is relevant for assessing financial distress conditions in this research object.

Table 5. Distribution of EMS zones based on year

Year	<i>Distress</i>	<i>Grey</i>	<i>Safe</i>	Total
2021	10 (15.87%)	4 (6.35%)	49 (77.78%)	63 (100%)
2022	9 (14.29%)	4 (6.35%)	50 (79.37%)	63 (100%)
2023	10 (15.87%)	4 (6.35%)	49 (77.78%)	63 (100%)
2024	12 (19.05%)	0 (0.00%)	51 (80.95%)	63 (100%)
2025	11 (17.46%)	3 (4.76%)	49 (77.78%)	63 (100%)
Total	52 (16.51%)	15 (4.76%)	248 (78.73%)	315 (100%)

Source: Stata output processed, 2026.

When viewed by year, the distress rate remained relatively stable throughout the study period. 2022 recorded the lowest distress rate at 14.29%, while 2024 saw the highest at 19.05%. This indicates that although the majority of companies are in the safe zone, financial stress remains consistent in some companies in each year of observation.

Table 6. Results of model selection and testing assumptions

Testing	Statistics	Probability	Decision
Chow Test	$F(62, 242) = 46.49$	0.0000	FEM > CEM
LM Breusch-Pagan test	$\chi^2(01) = 454.70$	0.0000	REM > CEM
Hausman test	$\chi^2(6) = 19.76$	0.0031	FEM > REM
Heteroscedasticity Test	$\chi^2(63) = 15765.94$	0.0000	There is heteroscedasticity
VIF	Mean VIF = 1.38	-	There is no multicollinearity

Source: Stata output processed, 2026.

Test results model selection shows that selected Fixed Effect Model approach as specification the most appropriate estimate in study this . At this stage Initially, the Chow test yielded probability of 0.0000, which indicates that more fixed effect specifications appropriate compared to the common effect considering heterogeneity characteristics intercompany that needs accommodated in estimation . Next , the Lagrange Multiplier test produces probability of 0.0000, so the random effect model is also more Good compared to the common effect. However, the results of the Hausman test show probability of 0.0031. Because the value the significant, then fixed effect specifications proven more superior compared to random effects. Based on a series testing mentioned, Fixed Effect Model is determined as approach estimate main in study This.

Testing assumptions are also made For ensure feasibility of the regression model. Multicollinearity test results shows a mean VIF of 1.38, indicating that No there is meaningful linear relationship between variables explanatory factor in the model. However, the heteroscedasticity test produce probability of 0.0000, which indicates existence problem heteroscedasticity intercompany. For overcome matter the model is estimated using Fixed Effect with clustered standard errors grouped at the company level to produce inference more statistics reliable to heterogeneity variance in panel data structures.

Table 7. Results of the Fixed Effect Model test with clustered standard errors

Variables	Coefficient	Robust Std. Error	t- statistic	p-value	Information
CCC	-0.0062	0.0025	-2.45	0.017	Significant 5%
DER	-0.1471	0.0843	-1.75	0.086	Significant 10%
<i>Firm size</i>	2,1216	0.8738	2.43	0.018	Significant 5%
<i>CCC x Firm size</i>	0.0034	0.0027	1.26	0.214	Not significant
<i>DER x Firm size</i>	-0.0372	0.1397	-0.27	0.791	Not significant
<i>Sales growth</i>	0.1225	0.2557	0.48	0.634	Not significant
Constant	9,2481	0.2757	33.54	0,000	Significant 1%

Source: Processed Stata output, 2026. Note: 2021 is used. as year base; 2022-2025 dummies are included in the model but No displayed in table Because all of it No significant.

The model proved to be significant overall with Prob > F = 0.0000. The Within R-squared of 0.2272 indicates that approximately 22.72% of the dynamics of changes in EMS within a company over time can be explained by the variables included in the model. The rho value of 0.9424 indicates that most of the residual variation comes from differences in characteristics between companies, so the use of fixed effects is relevant in this study.

Table 8. Summary testing hypothesis

Hypothesis	Statement	Statistical Results	Decision
H1	CCC is influential negative to EMS	Coef . -0.0062; p = 0.017	Supported
H2	DER has an impact negative to EMS	Coef . -0.1471; p = 0.086	Not supported at 5%; significant weak at 10%
H3	<i>Firm size</i> weaken influence CCC negative to EMS	Interaction coefficient 0.0034 ; p = 0.214	Not supported

Hypothesis	Statement	Statistical Results	Decision
H4	<i>Firm size</i> weaken influence negative DER against EMS	Interaction coefficient - 0.0372 ; p = 0.791	Not supported

Source: Stata output processed, 2026.

Discussion

Influence Cash Conversion Cycle in Financial Distress

CCC proven own influence negative as well as significant against EMS. Coefficient of -0.0062 with a p-value of 0.017 implies that extension duration cycle correlated cash conversion with decline company's EMS score. In EMS, the score more low reflect condition finance more weak , so that poor working capital management efficient can enlarge risk of financial distress in the companies studied.

Findings This in line with draft working capital management that funds have been held for too long in inventory and receivables can pressing liquidity as well as increase need financing term short. In Food and Beverage companies, management inventory, receivables business, accounts payable, sales, and expenses main sale become very important Because activity operational sector This related close with rotation goods and necessities long-term cash short. Umar et al. (2024) found that period working capital turnover or Cash Conversion Cycle is proven enlarge possibility occurrence Bankruptcy of halal food and beverage companies in a number of countries. In Indonesian context, findings this is also consistent with Andoko and Santana (2025) who showed that CCC has an effect to risk measured bankruptcy using the Altman Z-Score. In addition, Amaliah and Darmawan (2019) also showed that CCC is relevant in explain financial distress, so that efficiency working capital management become aspect important in guard health finance company. With Thus, H1 in the study This supported.

Influence Debt to Equity Ratio to Financial distress

DER has coefficient negative of -0.1471 with a p-value of 0.086. The direction of the coefficient This in accordance with hypothesis that the increasing use of debt against equity, the more low the company's EMS value. However, the influence the No significant at the 5% level, although significant weak at 10% level. With Thus, H2 does not supported at the level significance of 5%, but direction DER's relationship to EMS remains consistent with suspicion theoretical.

Findings This show that DER as proxy capital structure not yet give proof strong statistics in explain financial distress at the level significance main. However, the direction negative DER coefficient against EMS remains support argument that leverage is high can add pressure finance, especially when company face interest expense, liabilities term short , or limitations cash flow. Umar et al. (2024) stated that high leverage levels enlarge risk bankruptcy of companies in the food and beverage sector. In In the Indonesian context , Sihombing and Angela (2024) found that that there is significant influence between leverage

and financial distress in Food and Beverage companies. Although Thus, the DER results are only significant weak also in line with proof that leverage effect does not always consistent. Ramadini and Rusliyawati (2023) found that leverage was not own influence on the financial distress of F&B companies on the IDX, while Akashi (2025) shows that leverage and firm size do not always significant . In addition, DER is sensitive to equity. When equity small or negative, the DER value can become extreme, so DAR is needed as leverage comparison against EMS in evaluate whether direction connection the still stable on alternative models study.

Influence Firm size in financial distress

Influence positive significant indicated by the size company with coefficient of 2.1216 and p-value of 0.018. These results show that more companies big tend own higher EMS value height . In other words, the size company related with condition more finances healthy and lower risk of financial distress low.

Findings This can explained Because company sized large in general supported by a larger asset base substantial, ability more solid operations, as well as more convenience big in access source funding external. Umar et al. (2024) found that firm size decreases probability bankruptcy in food and beverage companies, while Heller et al. (2025) showed that company small and medium tend more prone to face constraint financing compared to company big . In In the Indonesian context , Astuti and Dewi (2024) also showed that size company related with financial distress. Therefore that, even though firm size is placed as variables moderation, results regression show that his role more strong as factor directly related with health finance company.

The Role of Moderation Firm size

Testing interaction show that size company No capable conditioning the influence of CCC and DER on EMS. The interaction of CCC x firm size has coefficient positive of 0.0034, but No significant with a p-value of 0.214. Positive direction This Actually show trend that size company can weaken impact CCC negative to EMS, but proof the statistics No Enough strong . With Thus , H3 is not supported .

DER x firm size interaction has coefficient negative -0.0372 and p-value 0.791. These results show that effect moderating firm size on influence negative DER on EMS no confirmed in a way statistics . With Thus , H4 is not supported . In overall , findings This hinting that although size company related in a way direct with condition more finances healthy, its capacity in modify connection between working capital management as well as capital structure with financial distress does not Enough strong proven in a way empirical. In other words, the role of firm size is more appropriate positioned as determinant direct health finance , not as conditioning variables the influence of CCC and DER on EMS.

Table 9. Robustness check results

Testing	Main Variables	Results	Interpretation
DER replaced by DAR	DAR	Coef . -10.3649; p = 0.000	Leverage based asset influential negative significant to EMS
DER replaced by DAR	CCC	Coef . -0.0015; p = 0.526	CCC no significant in the DAR model
DER replaced by DAR	Firm size	Coef . 2.0272; p = 0.007	Size company still influential positive significant to EMS
DER replaced by DAR	DAR x Firm size	Coef . -1.0665; p = 0.166	Moderation firm size on Leverage No significant
Logit distress	DER	OR 1.5192; p = 0.130	DER increases opportunity distress , but No significant
Logit distress	Firm size	OR 0.7547; p = 0.089	Size company lower opportunity distress in a way weak at 10%
Logit without grey zone	DER	OR 1.5382; p = 0.138	Direction of results consistent , but No significant
Logit without grey zone	Firm size	OR 0.7499; p = 0.092	Size company still tend lower opportunity distress

Source : Stata output processed , 2026. Note : or indicates the odds ratio in the logit model with distress = 1 for EMS < 4.35.

The first robustness check was conducted by replacing DER with DAR. The results showed that DAR had a significant negative effect on EMS with a coefficient of -10.3649 and a p-value of 0.000. This finding confirms that the level of liability-based funding is closely correlated with a decline in a company's financial health. Compared to DER, DAR provides stronger results because it measures the proportion of assets financed by liabilities. The robustness check results, which show a significant negative effect of DAR on EMS, are also in line with Astuti and Dewi (2024), who found that DAR has a positive effect on financial

distress. This shows that the composition of financing based on liabilities relative to assets is a strong predictor in explaining financial distress in F&B companies.

However, in the DAR model, CCC is not Again significant. Difference This show that the influence of CCC on EMS is not completely robust when capital structure is measured using DAR. With Thus, the influence working capital management still seen on the main model, but his strength reduce when influence leverage based asset taken into account in a way more strong. Firm size still positive and significant in the DAR model, so that results about role direct size company relatively consistent.

Second robustness check done with change EMS to dummy distress. Regression results logistics show that DER has odds ratio more big from one, namely 1.5192, which means that DER tends to increase opportunity company is at in condition distress. However, the influence This No significant in a way statistics. Firm size own odds ratio not enough from one, namely 0.7547, and significant weak at the 10% level, so size company tend lower opportunity distress. The same results also appeared when grey zone issued from analysis. With Thus , logit testing supports direction general main model results, especially about role protective size company, although No all over variables significant.

CONCLUSION AND SUGGESTIONS

Study This done For examine relatedness between working capital management and capital structure towards financial distress, at the same time see whether size company capable play a role as variables moderation in companies Food and Beverage companies listed on the Indonesia Stock Exchange for the 2021–2025 period . Based on results estimation , Cash Conversion Cycle proven own influence negative and significant to Altman Emerging Market Score . This means that the longer the cycle cash conversion takes place, the more conditions also deteriorated health finance company. Meanwhile that is, Debt to Equity Ratio show direction connection negative to EMS, but its influence Not yet significant at the 5% level and only show significance weak at 10% level.

Other results show that size company influential positive and significant to EMS. Findings This indicates that company with scale more assets big tend own condition more finances strong and risky greater financial distress low. However, the size company No proven moderate connection between CCC and DER towards EMS. With thus , in study This size company more appropriate understood as related factors direct with health finance company , not as strengthening factors or weaken influence working capital management and capital structure towards financial distress.

Testing robustness show that when DER is replaced with Debt to Asset Ratio, leverage based asset influential negative and significant against EMS. These results strengthen proof that structure increasing funding based on liabilities can pressing health finance company . In general overall , research This show that efficiency working capital management , control leverage , and scale company is aspect important in explain condition financial distress in companies Food and Beverage on the Indonesia Stock Exchange.

For the parties management , findings This confirm importance manage cycle cash conversion more efficient, especially through control inventory, receivables business, and business debt. Companies also need guard debt composition so as not to cause pressure finances that can weaken condition company. For investors and creditors , the indicators such as EMS, CCC, DER, DAR, and size company can used as consideration beginning in evaluate health finance company.

Study furthermore can expand object study to other sectors or do comparison between sectors so that the results obtained become more general. In addition, research future can also use size other financial distress, such as Altman Z-Score, Ohlson O-Score, Springate, Zmijewski, or approach machine learning. Variables addition like profitability, liquidity, operating cash flow, corporate governance, and other factors macroeconomics can also be considered for analysis financial distress become more comprehensive.

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