
**THE ROLE OF GOOD CORPORATE GOVERNANCE IN MODERATING THE
INFLUENCE OF LEVERAGE, CASH FLOW AND CORPORATE SOCIAL
RESPONSIBILITY ON FINANCIAL DISTRESS IN THE FOOD AND BEVERAGE
INDUSTRY ON THE INDONESIA STOCK EXCHANGE (IDX)**

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ABSTRACT

This study aims to test the CG Index as a representation of Good Corporate Governance (GCG) moderation on Debt to Asset ratio (DAR/leverage), operating cash flow, and CGRI Index as a representation of Corporate Social Responsibility (CSR) relationship with financial distress (FD) measured through the Altman Z-Score in 48 food and beverage subsector companies on the Indonesia Stock Exchange (IDX) for the 2020–2024 period. From a total population of 94 registered entities, a purposive sample was selected based on financial reporting continuity, yielding 240 observation units that served as the basis for estimation. Hypothesis testing was carried out using Moderated Regression Analysis (MRA) with an Estimated Generalized Least Squares (EGLS) approach based on Cross-Section Weights through the Eviews 13 software. The results of the estimation revealed four main findings: first, DAR was shown to contribute positively and significantly to the increased risk of FD (coefficient -5.159 ; $p=0.000$); second, operating cash flow worked in the opposite direction by significantly reducing the probability of FD (coefficient 2.588 ; $p=0.000$); third, higher intensity of CSR disclosure was negatively and significantly correlated with FD conditions (coefficient 0.438 ; $p=0.033$); fourth, the CG Index is statistically proven to be able to weaken the transmission of leverage risk while emphasizing the negative relationship of CSR to FD, but the similarly unconfirmed moderation capacity on the cash flow path indicates that the effectiveness of governance as a risk buffer is selective and depends on the characteristics of the variables interacting with it.

Keywords: Leverage, Cash Flow, Corporate Social Responsibility, Good Corporate Governance, Financial Distress.

1. INTRODUCTION

The manufacturing industry in the food and beverage subsector plays a vital role in Indonesia's economic system and in meeting the basic needs of all segments of society. The sector is known to have a stable growth rate, broad market demand, and relatively consistent consumption over time (BPS_Aceh, 2022). However, companies in this sector continue to face significant challenges, such as fluctuations in raw material prices, increasingly fierce competition, changing consumer preferences, and complex financial risks. In reality, not a few companies in this sector are under financial pressure and are trapped in a state of Financial Distress (FD) (Wardana et al., 2023). FD is a situation in which a business entity's financial performance declines significantly before the

company actually falls into a state of Bankruptcy. This situation is generally reflected in the company's inability to pay all its financial obligations that have reached the payment deadline, both short- and long-term (Platt & Platt, 2002).

Financial variables can be factors that affect FD. One of them is leverage. Leverage is a measure of the extent to which a company uses borrowed funds in its capital structure. A high level of leverage indicates a greater financial burden, as companies must bear significant interest payments and meet high loan obligations. If the company's income is insufficient to meet these obligations, then the risk of FD will increase (Yazdanfar & Öhman, 2020); (Giarto & Fachrurrozie, 2020). In addition to leverage, one variable often used to predict the occurrence of FD is cash flow. Cash flow reflects the movement of funds generated by a business entity's operational activities. The stability and adequacy of cash flow are a crucial benchmark in assessing the extent of a company's ability to bear liabilities, both short and long-term. Business entities that record positive cash flows tend to have greater financial flexibility, making them better protected against threats of FD. On the other hand, cash flows that are in deficit or fluctuate erratically may result in a company failing to settle its obligations to creditors according to an agreed schedule (Lee et al., 2017); (Wardana et al., 2023); (Giarto & Fachrurrozie, 2020).

Furthermore, to the variable Leverage and cash flow, there are other variables that play a role in identifying the potential for FD, i.e., Corporate Social Responsibility (CSR). CSR is a tangible manifestation of a company's ability to create a positive impact on the environment and the social life of the community at large. Good CSR not only improves the company's reputation but also builds the trust of investors and consumers, which can ultimately help the company survive difficult financial conditions. The implementation of CSR can provide a constructive signal to the market that the company has a long-term orientation toward maintaining the sustainability of its business (Farooq et al., 2023); (Samidi et al., 2018). In addition to the variables described earlier, Good Corporate Governance (GCG) also plays an equally important role in detecting the possibility of FD. GCG is a corporate governance system built on the principles of transparency, accountability, responsibility, independence, and equity in every decision-making process. In the scope of this study, GCG functions as a moderating variable that influences the strength of the relationship between leverage, cash flow, and CSR and the likelihood of FD.

Although past research focused on many businesses that showed declining financial performance in Indonesia's food and beverage sector, the phenomenon of FD can be traced to almost all sectors, especially in Indonesia, where its impact is growing. One of the actual examples of this situation is PT Tiga Pilar Sejahtera Food Tbk (AISA), which has experienced a financial crisis because of a lack of internal control and the application of GCG not being optimal. There are cash flow pressures as well, and now it is struggling to meet its debt obligations while also losing investor confidence. This case demonstrates that the weak GCG condition can expose the risk of FD. (Wardana et al., 2023): Indonesian Research FD can be identified through a number of business entities in the food and beverage sector that recorded a drastic decline in their financial performance. The clearest example of this condition is that PT Tiga Pilar Sejahtera Food Tbk (AISA) was already in financial crisis due to weak internal controls and running GCG has not been implemented as it should. This pattern is also confirmed with empirical evidence by (Giarto & Fachrurrozie, 2020), who show a significant relationship between an increased debt ratio and financial condition, as well as between the adequacy of operating cash flow, which has an inverse relationship, so that it significantly decreases the probability of financial pressure.

The study is particularly interesting in terms of the asymmetric nature of CG Index findings: A strong governance mechanism successfully cuts off the transmission chain between accumulated debt burdens and financial deterioration, but such capacities seem absent where moderated variables switch to cash flow, implicating a selectivity by characteristics within the interacting tone, suggesting varying GCG being more or less successful as a risk buffer. The empirical gap being mentioned is the basis for this research article. Based on the continuous financial report from 2020 to 2024, there are 240 observation units covering two periods of economic cycles after the pandemic in Indonesia, consisting of 94 food and beverage subsector companies listed on IDX, with as many as 48 entities that passed a strict selection. This specific window was selected because fiscal constraints in the industry peaked just after the recovery period, not in the crisis phase, as suggested by the average value of Altman Z-Score across our sample hovering at 4.28 - marginally above the Safe Zone threshold of 2.99. Under these circumstances, the pertinent question is not simply "can GCG moderate? That is, "Yes, but how soon does financial pressure become critical in relation to the power of GCG's moderating capacity? So, this study is based on three simultaneous tracks of tests: the direct effects of leverage (DAR), operating cash flow, and GRI Index CSR on their impact on FD probability; and the moderating capacity of CG Index in each one of these three routes, a configuration of variables previously never tested together for our entire population in the available domestic literature.

2. LITERATURE

2.1 Signaling Theory

Signaling theory is based on the conceptual work of (Spence, 1973), who identified that information asymmetry between insiders in firms and outsiders in the market was an active separation rather than a passive barrier; a gap actively exploited through credible messaging. Since parties with access to superior information will exhibit observable actions or make disclosures to the market, originally disadvantaged resource allocators, namely investors and creditors, can obtain a better measurement prior to the allocation of scarce resources.

2.2 Agency Theory

The conflictual nature of the capital owner-company management relation is at the heart of the framework devised by (Jensen & Meckling, 1976). Delegating operational decision-making from shareholders to management creates a permanent structural conflict of interest whereby those exercising executive authority need not utilize such power for the benefit of the mandated party. Agency theory exists not only to describe these relationships but also to identify the conditions under which the delegation of authority leads to decisions that are at odds with the best interests of capital owners, followed by asserting gridlocked mechanisms that can reduce the divide in such deviations.

2.3 Pecking Order Theory

(Myers & Majluf, 1984) define Pecking Order Theory as a hierarchy in the allocation of funds, indicating that companies prioritize internal funds for investment while optimizing them as a means of business development. This theory confirms that managers are more inclined to rely on internal financing than to seek funding from external parties. If external funding is unavoidable, managers will generally prioritize financial instruments with the lowest risk, such as debt issuance (Sudana, 2019).

2.4 Leverage on FD

The positive relationship between leverage and FD indicates that a high debt burden (as reflected in an increase in the leverage ratio) will place companies under financial pressure due to substantial interest repayment obligations and loan principal. This increased financial burden can eat into operating cash, reduce financial flexibility, and significantly increase the risk of FD. Map of empirical results related to the relationships of Leverage and FD. It does not actually form a single consensus. (Giarto & Fachrurrozie, 2020) documented that the expansion of debt burden directly contributes to the deterioration of the company's financial condition, consistent with the predictions of the Trade-Off Theory. But that position does not stand alone; (Shehzad et al., 2020) and (Wardana et al., 2023) instead arrive at a conclusion in the opposite direction, where the intensification of the Leverage It is recorded to be negatively correlated with the probability of financial stress, an outcome that suggests that debt, in certain contexts, can function as a financial discipline instrument that actually reduces risk. At the poles, (Dianova & Nahumury, 2019) failed to establish a statistically significant relationship between the two, indicating that the influence of Leverage on FD. It is most likely to be context-dependent, depending on the industry's characteristics, the period of observation, and the composition of the sample's capital structure. Based on the above explanation, the hypotheses that can be formulated in this study are:

H1: Leverage affects FD.

2.5 Cash Flow on FD

The negative relationship between cash flow and FD can be understood through signaling theory. Strong operating cash flow sends a positive signal to the market that the company can fund its operations independently without relying on external debt. Maintained liquidity is the company's main protector against the risk of FD, especially in the food and beverage industry, which requires large working capital to manage inventory and supply chains. In studies by (Giarto & Fachrurrozie, 2020) and (Wardana et al., 2023), cash flow was consistently found to be negatively and significantly related to FD. Research from (Nasution, 2019) and (Pandapotan & Puspitasari, 2022) found a significant positive relationship. Referring to the explanation that has been presented earlier, the hypotheses that can be put forward in this study are:

H2: Cash flow affects FD

2.6 CSR on FD

CSR is a tangible manifestation of a company's commitment to making contributions focused on social and environmental issues to produce a positive impact for a wide audience. Effective CSR implementation not only boosts the company's image but also helps build trust with investors and consumers, which, in turn, can support the company's sustainability amid challenging financial conditions. (Farooq et al., 2023). Empirical studies on the relationship between CSR and FD have not yet produced a convergent consensus. (Farooq et al., 2023) and (Nugrahanti, 2021) consistently revealed that the increase in the intensity of CSR disclosure is negatively and significantly correlated with the probability of FD, a finding that is relevant to the premise of signaling theory, namely that comprehensively documented CSR commitments function as a signal of management credibility to external stakeholders. Starting from these results, (Setiorini et al., 2022) actually obtained empirical evidence that shows the opposite direction of the relationship, where the intensification of CSR activities is recorded to move in the direction of

increasing risk of financial stress, which indicates that the allocation of resources for strategically unplanned CSR programs has the potential to burden the company's operational cost structure. Meanwhile, (Wardana et al., 2023) did not obtain sufficient statistical evidence to confirm the CSR impact on FD, so the relevance of this variable as a predictor of a company's financial condition seems to be conditional and strongly influenced by the characteristics of the industry and the measurement instruments used in the study. From this description, the hypothesis proposed is:

H3: CSR affects FD

2.7 Simultaneous Influence of Leverage, Cash Flow, CSR, and GCG on FD

Financial and non-financial indicators have an interaction while analyzing the likelihood of FD. This research simultaneously determines the effect of leverage, cash flow, CSR, and GCG on FD. The Trade-Off Theory stresses that the increase of leverage over the target level raises bankruptcy cost and provides a trigger for FD. Related, Signaling Theory demonstrates that a strong operating cash flow communicates liquidity stability as well, leading to both lower levels of FD. CSR disclosure can therefore be seen as a rational and tangible tool to control reputation and trust, which are needed for corporate survival in economic pressure situations from a non-financial point of view (Farooq et al., 2023). Lastly, GCG provides the control mechanism that helps mitigate agency conflicts and can effectively align managerial objectives with the interests of firm owners (Akram & Haq, 2022) as would be conceived from the Agency Theory perspective. Findings From Empirical Studies Conducted by (Wardana et al., 2023) indicate that the combination of these variables affects FD together. In general, capital structure management, cash flow strength, corporate social commitment and governance quality work together to affect a company's overall fundamental resistance to FD. According to this description, the hypothesis is as follows.

H4: Leverage, cash flow, CSR, and GCG simultaneously affect FD

2.8 GCG Moderation in the Leverage Impact On FD

In the view of agency theory, GCG is a governance mechanism to minimize potential conflicts of interest that arise between managers and shareholders. So the implementation of GCG is also expected to gradually improve the performance of the company and reduce the probability of FD. Under Agency Theory, the GCG functions as a management control mechanism to mitigate agency problems between shareholders and management. The best GCG implementation will most likely improve the effectiveness of company performance and lower the likelihood of FD. Based on the results of previous studies, (Setyobudi et al., 2017) found that high-quality corporate governance can weaken the positive impact or negative relationship between Leverage and FD. Instead, (Bilqis et al., 2022) find a contrasting result, where the weak implementation of GCG tends to strengthen the positive effect of Leverage on FD. Based on the description, the hypothesis is as follows.

H5: GCG moderates the leverage impact on FD.

2.9 GCG Moderation in the Cash Flow Impact On FD

According to the Agency theory, the effectiveness of cash flow in avoiding FD depends significantly on management quality. An effective GCG will ensure that operational cash flow is allocated productively, and not just for the benefit of managers themselves; thus maximizing its

role in maintaining the liquidity of companies. The findings of this research are similar to those of (Munandar & Triyana, 2024) and (Giarto & Fachrurrozie, 2020), stating that GCG was unable to moderate cash flow on FD. A hypothesis is suggested from such a description.

H6: GCG moderates the cash flow impact on FD.

2.10 GCG Moderation in the CSR Impact On FD

Effective GCG mechanisms in companies, such as independent commissioners and institutional ownership, ensure that investments in CSR programs are not ceremonial or symbolic but incorporated into long-term business strategies for the sustainability of the company. This relentless oversight will make management run the CSR programs that are of real value, e. g., a better company reputation, customer loyalty, or complete operational efficiency as an example. According to (Nugrahanti, 2021) and (Wardana et al., 2023), good GCG consistently magnified the negative CSR-FD relationship. Given this description, the proposed hypothesis is:

H7: GCG moderates the CSR impact on FD.

3. METHOD

3.1. Sample

All companies in the food and beverage subsector whose shares are listed as active on the Indonesia Stock Exchange (IDX) during the 2020–2024 period constitute the population of this study, totaling 94 listed entities. From this population, the sample selection process was carried out using the purposive sampling technique, a substantive consideration-based screening mechanism that limits the sample to only entities that meet two cumulative conditions: first, the continuity of listing on the IDX without interruption during the entire observation period 2020–2024; second, the completeness and availability of audited financial statements which is fully accessible to the public in the same period. The application of these two criteria resulted in 48 companies that met the eligibility threshold as an analysis unit. With a five-year layered data panel structure, the total number of observation units processed in this study reached 240, providing an adequate empirical basis to accommodate cross-company variation and temporal dynamics within a single estimation framework.

3.2 Data Collection Sources and Techniques

All data analyzed in this study are secondary, extracted from the annual financial statements and sustainability reports of the sample companies. Data acquisition was carried out through three official channels simultaneously: the IDX capital market data portal at www.idx.co.id, the www.idnfinancials.com financial statement aggregation platform, and the corporate websites of each company under observation. The variables collected include FD proxies based on the Altman Z-Score, the DAR as a representation of leverage, the ratio of operating cash flow to total assets, the GRI Index as a quantitative instrument for CSR, and the CG Index to operationalize GCG. The enrichment of theoretical and empirical context is carried out through a systematic literature search that includes reputable scientific journals, academic monographs, and relevant online reference sources.

3.3 Data Analysis

The hypothesis test in this study relies on the panel data regression framework, implemented in Eviews 13, which was chosen for its ability to integrate the cross-sectional dimensions of 48 companies with the time-series dimension across 2020–2024 in a single simultaneous estimation.

Before estimation, descriptive statistical analysis is conducted to characterize the distributions of each variable using mean, maximum, minimum, and standard deviation. Hypothesis testing is carried out through three graded procedures: the determination coefficient (R^2) to measure the apparent power of the model, the F-test to evaluate the significance of simultaneous influences, and the t-test to test the partial contribution of each independent variable. Specifically, to test the capacity of GCG as a moderating variable, Moderated Regression Analysis (MRA) was applied using the Estimated Generalized Least Squares (EGLS) estimation approach based on Cross-Section Weights, a method that explicitly accommodates heterogeneity across sample entities while correcting for potential autocorrelation detected in the base model.

4. RESULT AND DISCUSSION

4.1. Descriptive Analysis

The descriptive analysis of all the variables is presented as follows.

Table 1. Descriptive Statistical Analysis

	FD	LEV	CF	CSR	GCG
Red	4.2816 46	0.49513 6	0.06891 9	0.47593 6	0.9494 79
Median	3.0690 59	0.47390 5	0.07536 3	0.50427 4	1.0000 00
Maximum	30.786 84	2.64167 9	0.54098 7	0.96581 2	1.0000 00
Minimum	- 7.1959 10	0.06715 4	- 0.90893 8	0.00854 7	0.1500 00
Std. Dev.	4.4421 53	0.32909 5	0.13055 1	0.29218 2	0.1732 87
Skewness	1.4830 82	3.12526 7	- 1.83660 4	- 0.07267 0	- 3.5035 84
Kurtosis	8.3538 27	18.4443 7	17.4271 7	1.84812 7	14.022 67
Jarque-Bera	374.61 59	2775.97 7	2216.35 7	13.4793 5	1705.9 96
Probability	0.0000 00	0.00000 0	0.00000 0	0.00118 3	0.0000 00
Sum	1027.5 95	118.832 6	16.5406 0	114.224 6	227.87 50
Sum Sq. Dev.	4716.1 22	25.8845 7	4.07341 9	20.4035 1	7.1768 10

Observations	240	240	240	240	240
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Source: Eviews Output Data (2026)

Based on Table 1, the FD has an average value of 4.28, which is theoretically within the Safe Zone (> 2.99). However, a standard deviation of 4.44 exceeds the average, and the very wide range of values between -7.19 and 30.78 indicates a significant gap in financial condition between the sample companies. For the leverage variable, proxied by the DAR, recorded an average of 0.495 (49.5%), indicating a moderate level of debt utilization. The lower standard deviation (0.329) than the average value suggests that the composition of funding across companies in the sample tends to be uniform, although the maximum value of 2.64 indicates the presence of companies with negative equity.

Furthermore, Table 1 also shows that the cash flow variable, proxied by the ratio of operating activities to total assets, has an average of 0.068 (6.8%), reflecting the company's limited capacity to generate cash. The standard deviation of 0.130, which exceeds the average, and the negative minimum value of -0.90, illustrate the considerable liquidity performance disparity between the sample companies. Next, the CSR variable, proxied by the GRI Index, shows a level of disclosure in the middle category, with an average value of 0.475. The relatively stable standard deviation of 0.292 is still below the mean of 0.475, but the wide range of 0.008 to 0.96 indicates a substantial gap in social reporting commitment between companies that are just starting out and those that have implemented it comprehensively. Meanwhile, the GCG variable measured using the CG Index showed a very high level of implementation with an average score of 0.949. The small standard deviation value of 0.173 indicates that the quality of corporate governance in the sample companies has been evenly distributed and has met most of the indicators covered in the CG Index.

4.2 Panel Data Regression Model Selection Analysis

4.2.1 Chow Test

The Chow Test was operated as an initial selection procedure in determining the regression data panel model that was most compatible with the data structure of this study, specifically to test whether the Fixed Effect Model (FEM) produced a more accurate estimate than the Common Effect Model (CEM) through the comparison of the residual values of the two specifications. The results are presented below.

Table 2. Chow Test

Effects	Stat	D.F.	P
Cross-section F	7.122832	(47,188)	0.0000
Cross-section Chi-square	245.4493	40	470.0000

Source: Eviews Output Data (2026)

Referring to Table 2, the two Chow test statistics, both Cross-Section F and Cross-Section Chi-Square, yielded a p of 0.0000, which was well below the significance threshold of 0.05. The consistency of the two values provides a strong basis for rejecting H_0 and confirming that the FEM

provides a superior fit to the data structure of this study compared to the CEM. Based on this decision, the model selection process continued to the next stage using the Hausman Test.

4.2.2 Hausman Test

The Hausman Test is used as a selection instrument to determine which estimation model is statistically superior between the FEM and the Random Effect Model (REM), with the test logic resting on the existence or absence of a systematic correlation between individual effects and explanatory variables in the model. The results of this test stage are presented in detail in the following table:

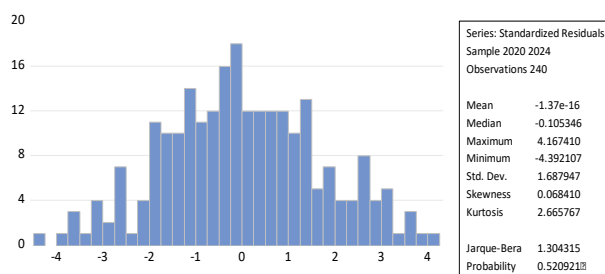
Table 3. Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. D.F.	Prob.
Cross-section random	9.7907034		0.0441

Source: Eviews Output Data (2026)

Referring to Table 3, the random Chi-Square cross-section statistic yields a p of 0.0441, which is consistently below the critical limit of 0.05 and thus sufficient to reject the null hypothesis. This statistical decision confirms that the FEM is the specification that best fits the data characteristics of this research panel, given its advantages, which have proven to be more reliable than the Random Effect Model in capturing heterogeneity between entities inherent in the analyzed sample of food and beverage companies.

4.3 Classical Assumption

4.3.1 Normality



Source: Eviews Output Data (2026)

Figure 1. Normality

Referring to the normality test presented in Figure 1 above, the Jarque-Bera Probability obtained was 0.520921 exceeding the critical limit of 0.05, so it concludes that the data is distributed normally.

4.3.2 Multicollinearity

Table 4. Multicollinearity

	LEV	CF	CSR	GCG
LE	1.00000			
V	0	-0.252363	0.182116	0.125042
	-			
CF	0.252363	1.000000	-0.052202	-0.015735
CS	0.18211			
R	6	-0.052202	1.000000	0.071272
GC	0.12504			
G	2	-0.015735	0.071272	1.000000

Source: Eviews Output Data (2026)

Based on the results in Table 4, the multicollinearity test indicated that all independent and moderating variables had correlation values below 0.90. This condition shows that there is no problematic linear relationship between the variables Leverage (LEV), Cash Flow (CF), CSR, and GCG. Thus, this research model is declared free from multicollinearity problems.

4.3.3 Heterokedasticity Test

Table 5. Heterokedasticity

Var.	Coeff.	S.E	t-Stat	P
				0.559
C	0.402541	0.688356	0.584786	4
				0.184
LEV	-0.291155	0.218799	-1.330697	9
				0.126
CF	0.385061	0.250722	1.535809	3
				0.065
CSR	0.181474	0.097843	1.854752	2
				0.508
GCG	0.470064	0.708878	0.663109	1

Source: Eviews Output Data (2026)

Based on the heteroscedasticity test table above, estimated using the fixed-effect model EGLS (cross-sectional weight), there was no evidence of heteroscedasticity in this study. This condition is characterized by the probability values of all independent and moderating variables recorded above the threshold of 0.05, indicating that the model is free from heteroscedasticity.

4.3.4 Autocorrelation

Based on the Durbin-Watson table with $\alpha = 5\%$, using 3 independent variables and 1 moderation variable and 240 observations, the dL value of 1.76325 and dU of 1.81384 were obtained. The decision-making criteria for the autocorrelation test are as follows.

- If $DW < 1.76325$, then a positive autocorrelation occurs.

- If $1.76325 < DW < 1.81384$ then there is doubt that there will be an autocorrelation
- If $1.81384 < DW < 2.18616$ then there is no autocorrelation
- If $2.18616 < DW < 2.23675$ then there is doubt that autocorrelation occurs
- If $DW > 2.23675$ then a negative autocorrelation occurs

The autocorrelation test is shown below.:

Table 6. Autocorrelation

	0.96858	11.940
R-squared	5	lean dependent var 98
Adjusted R-squared	0.96006	11.953
3	.D. dependent var	79
S.E. of regression	1.90317	680.95
5	um squared resid	03
F-statistic	113.655	1.6494
4	urbin-Watson stat	47
	0.00000	
Prob(F-statistic)	0	

Source: Eviews Output Data (2026)

Autocorrelation testing using a fixed effect model with cross-section weights yielded a Durbin-Watson value of 1.649447. This value is below dL, indicating a positive autocorrelation in the model. Based on the evaluation of the four classical assumptions implemented, it was found that the assumption of autocorrelation was violated. If this problem is not addressed, the results of the analysis may be biased, and the standard errors may affect the validity of the findings. To overcome these problems, this study used the Estimated Generalized Least Squares (EGLS) model as the analytical approach. However, if after weighting there are still indications of autocorrelation, this does not necessarily invalidate the model.

4.4 Multiple Linear Regression

The analytical approach applied in this study is multiple linear regression analysis (Ghozali, 2018). Given that the multiple linear regression test is identical to the first equation in the test Moderated Regression Analysis (MRA), the results of the processing are described in detail in the following section.

4.5 Moderated Regression Analysis (MRA)

MRA was conducted to test how leverage, cash flow, and CSR affect FD, with GCG as a moderator. Three regression tests are needed to determine how the moderator variable interacts with the dependent and independent variables. The following is the regression equation that will be tested.

$$FDS = \beta_0 + \beta_1LEV + \beta_2CF + \beta_3CSR + e \dots \text{Equations (1)}$$

$$FDS = \beta_0 + \beta_1LEV + \beta_2CF + \beta_3CSR + \beta_4 GCG + e \dots \dots \dots \text{Equations (2)}$$

$$FDS = \beta_0 + \beta_1LEV + \beta_2CF + \beta_3CSR + \beta_4 GCG + \beta_5(LEV \times GCG) + \beta_6(CF \times GCG) + \beta_7(CSR \times GCG) + e \dots \dots \dots \text{Equation (3)}$$

Where:

SDS : Financial Distress

LEV : Leverage

CF : Cash Flow/ Cash Flow

CSR : CSR

GCG : GCG (moderation variable)

LEVxGCG : Multiplication moderate interaction between the independent variable (LEV) of leverage and the moderation variable (GCG)

CFxGCG : Moderate interaction of multiplication between independent variables (CFs) of cash flows and moderation variables (GCG)

CSRxGCG : Moderate interaction of multiplication between independent variables (CSR) and moderation variables (GCG)

e : error

4.5.1 MRA Test Equation 1

Model 1 equation:

$$FDS = \beta_0 + \beta_1LEV + \beta_2CF + \beta_3CSR + e$$

4.5.1.1 T-Test Results

Table 7. T-Test Results (1)

Var.	Coeff.	S.E	t-Stat	P.
				0.000
C	6.445125	0.271847	23.70863	0
				0.000
LEV	-5.150967	0.475981	-10.82180	0
				0.000
CF	2.588956	0.478009	5.416125	0
				0.033
CSR	0.438130	0.203983	2.147878	0

Source: EvIEWS Output Data (2026)

Based on the statistical processing, the regression equations formed are as follows:

$$FDS = 6,445125 - 5,150967 LEV + 2,588956 CF + 0,438130 CSR$$

1. The constant of 6.445125 indicates that if all independent variables (leverage, cash flow, and CSR) are zero, the Altman Z-score for FD is estimated to be 6.445125.
2. The variable leverage coefficient (LEV) of -5.159967 indicates that a one-unit increase in leverage decreases the Altman Z-score by 5.159967, suggesting that the risk of FD increases.

3. The variable coefficient of cash flow (CF) of 2.588956 indicates that every increase in one unit of cash flow will increase the Altman Z-score value by 2.588956, which means that the risk of FD is reduced.
4. The CSR variable coefficient of 0.438130 indicates that every increase in one CSR unit will increase the Altman Z-score by 0.438130, which means that the risk of FD tends to decrease.

4.5.1.2 F-Test Results

Table 8. F Test (1)

		Mean	dependent	11.9999
R-squared	0.968421	var	3	
Adjusted R-squared	0.960066	S.D. var	dependent	11.9644
			8	
				690.450
S.E. of regression	1.911329	Sum squared resid	5	
		Durbin-Watson	stat	1.63606
F-statistic	115.9186		3	
Prob(F-statistic)	0.000000			

Source: Eviews Output Data (2026)

From the F-test, an F-statistic of 0.00000 and a p of 0.00000 were obtained, both below the significance threshold of 0.05. These results indicate that leverage, cash flow, and CSR simultaneously significantly affect FD among food and beverage subsector companies listed on the Indonesia Stock Exchange.

4.5.1.3 R Square

Table 8 shows the R-squared of 0.968421 or 96.84 percent. This means that the model explains 96.84 percent of the variation in FD, while the remaining 3.16 percent is explained by other variables outside the model.

4.5.2 MRA Test Equation 2

Model 2 equation:

$$FDS = \beta_0 + \beta_1 LEV + \beta_2 CF + \beta_3 CSR + \beta_4 GCG + e$$

4.5.2.1 T-Test Results

Table 9. T-Test Results (2)

Var.	Coeff.	S.E	t-Stat	P
				0.000
C	6.134306	1.748622	3.508081	6
				0.000
LEV	-5.1570930	0.478874	-10.769200	
				0.000
CF	2.564862	0.478391	5.361438	0

				0.031
CSR	0.440494	0.202998	2.169941	3
				0.855
GCG	0.331115	1.817023	0.182230	6

Source: EvIEWS Output Data (2026)

From the statistical processing, the regression equations produced are as follows:

$$FDS = 6,134306 - 5,157093 \text{ LEV} + 2,564862 \text{ CF} + 0,440494 \text{ CSR} + 0,331115$$

1. The model constant of 6.134306 indicates that if the variables for leverage, cash flow, and CSR are zero, the FD proxy, the Altman Z-Score, will be 6.134306.
2. The variable leverage coefficient (LEV) of -5.157093 shows that every increase in one unit of leverage will lower the Altman Z-score by 5.157093, which implicitly increases the risk of FD.
3. The variable coefficient of cash flow (CF) of 2.564862 explains that every one unit increase in cash flow will increase the Altman Z-score by 2.564862, which means that the risk of FD is reduced.
4. The CSR variable coefficient of 0.440494 proves that every increase in one CSR unit will increase the Altman Z-score by 0.440494, which means that the risk of FD tends to decrease.
5. The GCG variable coefficient of 0.331115 indicates that every increase in one unit of GCG will increase the Altman z-score by 0.331115, although the effect is not statistically significant.

4.5.2.2 F-Test Results

Table 10. F Test (2)

	0.96858	11.9409
R-squared	5	Mean dependent var 8
Adjusted R-squared	0.96006	11.9537
	3	S.D. dependent var 9
S.E. of regression	1.90317	680.950
	5	Sum squared resid 3
	113.655	1.64944
F-statistic	4	Durbin-Watson stat 7
	0.00000	
Prob(F-statistic)	0	

Source: EvIEWS Output Data (2026)

The F test shows a p of F-statistic is 0.00000, which is smaller than 0.05. This shows that leverage, cash flow, CSR, and GCG simultaneously have a significant effect on the risk of FD among food and beverage companies listed on the IDX.

4.5.2.3 R Square

Table 10 above shows the coefficient of determination (R-square) for equation 2, which is 0.968585, or 96.85 percent. This means that the variables, leverage, cash flow, CSR, and GCG included in the model can explain the variation in FD by 96.85 percent. The result from equation two increased by 0.01 percent relative to equation one when the moderation variable is not included

in the model. Therefore, based on the results, it can be concluded that adding GCG variables to the regression model only slightly increases the model's ability to predict FD. The remaining 3.15 percent was influenced by factors beyond the variables included in this research model.

4.5.3 MRA Test Equation 3

Model 3 equation:

$$\text{FDS} = \beta_0 + \beta_1\text{LEV} + \beta_2\text{CF} + \beta_3\text{CSR} + \beta_4\text{GCG} + \beta_5(\text{LEV} \times \text{GCG}) + \beta_6(\text{CF} \times \text{GCG}) + \beta_7(\text{CSR} \times \text{GCG}) + e$$

4.5.3.1 T-Test Results

Table 11. T-Test Results (3)

Var.	Coeff.	S.E	t-Stat	P
				0.000
C	29.12690	8.237444	3.535915	5
				0.000
LEV	-61.08390	17.53872	-3.482803	6
				0.642
CF	4.864090	10.46941	0.464600	8
				0.022
CSR	7.073192	3.075679	2.299717	6
				0.004
GCG	-24.00666	8.341419	-2.878006	5
				0.001
X1_M	57.95149	17.58547	3.295419	2
				0.811
X2_M	-2.508625	10.48947	-0.239156	2
				0.034
X3_M	-6.587925	3.086922	-2.134140	1

Source: Eviews Output Data (2026)

Based on the statistical analysis, the regression equations obtained are as follows:

$$\text{FDS} = 29,12690 - 61,08390 + 4,864090 + 7,073192 - 24,00666 + 57,95149 - 2,508625 - 6,587925$$

The regression equation above provides the following information:

1. The constant of 29.12690 indicates that if all independent, moderate, and interaction variables are zero, then the Altman z-score is estimated to be 29.12690.
2. The leverage regression coefficient (LEV) of -61.08390 indicates that every increase in one unit of leverage will lower the Altman Z-score by 61.08390, means that the FD is significantly increased.
3. A cash flow variable coefficient (CF) of 4.864090 indicates that each increase of one unit of cash flow will increase the Altman Z-score by 4.864090, although the effect is not statistically significant.

4. The CSR variable coefficient of 7.073192 indicates that every increase of one CSR unit will increase the Altman Z-score by 7.073192, which means minimizing the risk of FD.
5. The GCG regression coefficient of -24.00666 indicates that each additional unit in the GCG variable will change the Altman Z-Score by -24.00666 and reduce the level of FD by -24.00666.
6. The X1_M regression coefficient (leverage and GCG interaction) of 57.95149 indicates that a one-unit increase in the interaction variable increases the Altman Z-score by 57.95149, reflecting the role of GCG in moderating the leverage impact on FD.
7. The X2_M coefficient (interaction of cash flow and GCG) of -2.508625 indicates that every increase of one unit of the interaction variable will decrease the Altman Z-score by 2.508625, but the effect is not statistically significant.
8. The X3_M regression coefficient (interaction of CSR and GCG) of -6.587925 indicates that every increase of one unit of the interaction variable will decrease the Altman Z-score by 6.587925, reflecting the role of GCG in emphasizing the negative influence of CSR on FD.

4.5.3.2 F-Test Results

Table 12. F Test (3)

	0.96570	11.4953
R-squared	9	Mean dependent var 1
Adjusted R-squared	0.95570	11.2211
	0	S.D. dependent var 0
S.E. of regression	1.77241	581.167
	2	Sum squared resid 1
	96.4819	1.70345
F-statistic	3	Durbin-Watson stat 5
	0.00000	
Prob(F-statistic)	0	

Source: Eviews Output Data (2026)

The test results showed a p of 0.0000000, which was smaller than 0.05, indicating that the variables LEV, CF, CSR, GCG, X1_M, X2_M, and X3_M simultaneously had a significant effect on the FDS variables.

4.5.3.3 R Square

Table 12 shows the R-squared value for the third equation, 0.965709, or 96.57 percent, indicating that the variables LEV, CF, CSR, GCG, X1_M, X2_M, and X3_M explain 96.57 percent of the variation in FD. This value is slightly lower than the previous equation, and the remaining 3.43 percent is explained by other variables outside the model.

4.6 Discussion

4.6.1 Leverage Impact On FD

The Altman Z-Score was negatively influenced by leverage, as this fit a statistical test demonstrating how leverage gradually increases FD indirectly. This means that the more leveraged a company is, the higher its risk of FD. Pecking Order Theory: This theory explains that companies prefer to use internal funding first and external debt as a second option. However, when the funds

required exceed internal capacity, the company has no choice but to resort to debt. Heavy leverage, particularly with interest-bearing liabilities, will steadily inflate the pay obligations on a cash basis and continuously erode the company's financial condition, posing an elevated risk of FD. Financial statements convey positive and negative information. In this sense, signaling theory is a framework in which balance sheets (the signals) are targeted directly to stakeholders. So, this ratio shows a lot of debt cost, resulting in financial problems when the leverage is high. The investors and creditors normally interpret this situation as a bad signal while analyzing the financial risk of the company. As such, these study results are in line with the fact that the likelihood of FD drastically increases. These findings are also in line with the results of research by (Giarto & Fachrurrozie, 2020), (Bilqis et al., 2022), and (Kartika & Hasanudi, 2019), who collectively found that an increase in leverage is directly proportional to the increased risk of FD.

4.6.2 Cash Flow Impact On FD

The statistical testing found that cash flow has a positive and significant effect on Altman Z-Score, which means the effects are negative for FD. Thus, the greater a firm's operating cash flow, the lower its risk of FD. Within the signaling theory framework, a high operating cash flow shows that the company can meet its funding requirements without relying on internal sources and thus minimizing its dependence on external loans. Such a situation also has an impact on the sustainability of the company's operational activities in order to reinforce firm value by reducing the occurrence of FD. On the other hand, the company's low operating cash flow and its inability to optimize internal funding sources reflect its unsatisfactory performance, which could send negative signals to investors and creditors. The increase in operating cash flow is inversely proportional to a company's vulnerability to FD: the greater the cash flow, the lower the threat of financial hardship. On the contrary, the decline in operating cash flow increases the likelihood that companies will fall into FD. Thus, the findings in this study are in line with the basic assumption that cash flow adequacy can make a meaningful contribution to reducing the potential for risk of FD. This result is also in line with the findings obtained by (Giarto & Fachrurrozie, 2020) and (Wardana et al., 2023).

4.6.3 CSR Impact On FD

The statistical test indicates that CSR positively affects Altman Z-Score, suggesting that CSR it negatively affects FD. Thus, the higher a company's commitment to implementing CSR, the lower its potential risk of FD. Through the lens of signaling theory, the increase in the company's CSR commitment sends a positive signal to the public that it has strong social concern and stable performance. This reflects the company's ability to build harmonious relationships with stakeholders and maintain long-term business continuity, while minimizing the risk of FD. Therefore, the findings of this study are consistent with the assumption that high levels of CSR significantly reduce the likelihood of FD. This result is also in accordance with the findings obtained by (Nugrahanti, 2021) and (Farooq et al., 2023).

4.6.4 Simultaneous Influence of Leverage, Cash Flow, CSR, and GCG on FD

The results of statistical testing reveal that all hypothesized variables, such as Leverage, Cash flow, CSR, and GCG, simultaneously have a significant impact on FD in food and beverage sub-sector companies. Now, following the Pecking Order Theory, priority or preference is given to internal funding Sources over external debt. But as capital needs rise, over-leverage or high debt can heighten the threat of financial distress (FD), alongside rising interest costs and greater amounts payable that the company must shoulder. Signaling Theory shows that high operating cash flow,

as a reflection of the company's ability to generate funds internally, is a good signal for investors and reduces FD risk. On the contrary, low cash flow is a negative signal that threatens business sustainability. In addition, the CSR concept supports the idea that CSR activities can increase stakeholders' trust and reputation, as well as strengthen corporate resilience in the food and beverage sector. This combination of financial and non-financial factors reflects the company's real condition and determines the level of FD experienced. Thus, the combination of these variables reflects the company's financial and non-financial conditions, which ultimately determine the high and low levels of FD it faces.

4.6.5 Leverage Impact on FD with GCG as Moderation

Based on the results of statistical tests, the GCG variable does not directly influence FD, but it does significantly interact with Leverage in relation to FD. This condition indicates that GCG performs its function as a Pure moderator (pure moderation) in the interconnectedness between Leverage and FD. The positive interaction coefficient in the model Z-score indicates that the presence of GCG can dampen the positive influence of Leverage on FD, so that the more effectively GCG is implemented in a company, the greater Leverage's capacity to exacerbate the risk of FD. In the agency theory, GCG is a control mechanism to prevent potential conflicts of interest between managers and shareholders. An optimal GCG implementation should enhance performance without increasing the potential of FD. Effective GCG mechanisms, such as proportionate independent commissioners and an active internal control system, provide firm-wide accountability together with prudent and productive funding decisions, thus helping to limit over-leveraging. Consequently, Findings from this study support our hypothesis that GCG moderates the positive effect between leverage and FD risk. This study is also in line with the research of (Setyobudi et al., 2017).

4.6.6 Cash Flow Impact on FD with GCG as Moderation

The statistical test results indicate that GCG is not proven to be a moderator of the cash flow influence on FD risk. This is because the interrelationship of cash flow and FD correspondingly depends more on internal fundamental factors in the company; sooner or later, the magnitude of such influence does not depend on the degree of quality of GCG applied. Such governance mechanisms based purely on administration may not counterbalance the more volatile cash flows that market dynamics generate, e.g., raw material price adjustment and consumer animals, etc. The results from this study align with (Munandar & Triyana, 2024) and also (Giarto & Fachrurrozie, 2020).

4.6.7 CSR Impact on FD with GCG as Moderation

The test result in this direct influence on FD with the CG Index only produced output that was not significant, but GCG provides a moderating effect that occurs on an interaction path with CSR, which can be seen from the $CSR \times GCG$ coefficient of -6.587 , and this value is significant at the level 0.034 . This type of estimation pattern puts GCG in the category of "pure" moderation of CSR and FD, which is only fundamentally different from the quasi-moderator role, where the moderator variable also has a direct effect on the dependent variable at the same time. Specifically, the negative sign of the interaction coefficient indicates that a better quality of governance always increases CSR capacity in providing a buffer against financial pressure. The roots of these findings are traceable through the lens of the agency theory: business entities equipped with high-quality internal governance systems are inclined to safeguard that social investment funds serve programs providing reputational and relational dividends that can be traced in an accountable way, versus

being opportunistically leveraged for short-term managerial interests.

As a result, every unit spent on CSR in a company with a high CG Index contributes more to building stakeholder trust and builds the financial resilience of that company more measurably than entities with weak implementation of governance. These findings are in line with the research results of (Nugrahanti, 2021), (Farooq et al., 2023), and (Wardana et al., 2023), which jointly corroborate that effective governance mechanisms serve as a catalyst in intensifying the ability of CSR to mitigate FD risk through each formal and non-formal channel. While all these studies are in varying samples, measurement instruments, and time periods, the commonality of findings serves to strengthen their external validity.

5. CONCLUSION

Based on a series of empirical tests that have been executed on 48 sub-sector companies in the food and beverage sector on the IDX with 240 observation units for the 2020–2024 period, the following seven conclusions can be formulated.

1. Leverage Impact on FD

Statistical testing confirms that the accumulated debt burden reflected in the DAR positively and significantly increases the probability of FD. The leverage coefficient of -5.159 on the Altman Z-Score implies that every increase in DAR is associated with a proportionate decrease in the financial resilience score, providing evidence that a capital structure overly reliant on external liabilities directly narrows the company's capacity to absorb financial shocks.

2. Cash Flow Impact on FD

In contrast to the previous moderation pattern, the CG Index did not succeed in proving its capacity as a moderator in the transmission line between operating cash flows and FD; the $CF \times GCG$ interaction coefficient of -2.508 did not reach the threshold of statistical significance ($p = 0.811$). This condition suggests that cash flow fluctuations in food and beverage companies are more driven by external factors beyond the reach of internal governance mechanisms, such as commodity price volatility and dynamics in consumer purchasing power that track the macroeconomic cycle.

3. CSR Impact on FD

The intensity of social responsibility disclosure quantified through the GRI Index was proven to move in the opposite direction with the probability of FD of the CSR coefficient of 0.438 reflecting that comprehensively documented social commitment builds reputational equity which in turn strengthens stakeholder trust and measurably suppresses the company's financial vulnerability.

4. The Simultaneous Impact of Leverage, Cash Flow, CSR, and GCG on FD

The results of the F-test with a p 0.0000 confirm that the four variables of DAR, operating cash flow, GRI Index, and CG Index together form a significant predictive capacity for FD. The R-Squared value of 96.84 percent indicates that this combination of financial and non-financial indicators explains almost all of the variation in FD in the sample, leaving only 3.16 percent unexplained by factors outside the model.

5. Leverage Impact on FD Moderated by GCG

The CG Index is statistically proven to mitigate the leverage impact on FD, with a significant $LEV \times GCG$ interaction coefficient of 57.951 at the 0.001 level. These findings indicate that a quality governance oversight mechanism that effectively mitigates the destructive impact of

companies' accumulated debt burden, as measured by the CG Index, can discipline debt use through a more accountable decision-making structure, thereby measurably mitigating risk transmission from leverage to FD.

6. Cash Flow Impact on FD Moderated by GCG

In contrast to the previous moderation pattern, the CG Index did not succeed in proving its capacity as a moderator in the transmission line between operating cash flows and FD; the CF×GCG interaction coefficient of -2.508 did not reach the threshold of statistical significance ($p = 0.811$). This condition suggests that cash flow fluctuations in food and beverage companies are more triggered by external determinants that are beyond the reach of internal governance mechanisms, such as the volatility of commodity prices and the dynamics of consumer purchasing power that move according to the macroeconomic cycle.

7. CSR Impact on FD Moderated by GCG

The moderation capacity of the CG Index was again confirmed in the CSR and FD relationship paths, with a significant CSR×GCG interaction coefficient of -6.587 at the level of 0.034 . The stronger the quality of an entity's governance, the more effective its CSR program is in reducing the probability of FD because optimal GCG encourages management to allocate social investment strategically and measurably, rather than just fulfilling symbolic obligations, so that each CSR expenditure unit generates more substantial reputational returns in strengthening the company's financial resilience.

Based on the findings and discussions that have been presented, some recommendations that can be considered include the following:

1. For academics and subsequent researchers, it is recommended to enrich the study by incorporating additional independent variables, such as liquidity, profitability, company growth, and other relevant variables suspected to contribute to FD. In addition, researchers are advised to expand the study's scope by extending the observation period beyond 5 years to yield more comprehensive and representative findings. In addition, the next researcher can consider adding other moderating variables beyond GCG, given that in this study, GCG was shown to moderate the relationship between leverage and CSR, but not the cash flow variable.
2. For investors, it is recommended to consider leverage, operating cash flow, CSR, and GCG quality when evaluating investment decisions. Given that leverage has been shown to increase the risk of FD, while cash flow and CSR can mitigate it, GCG can strengthen or weaken the relationships among these variables.
3. For the government, it is recommended to strengthen regulations on corporate governance (GCG) and to tighten oversight of issuers' leverage levels. In addition, the government is expected to encourage consistent improvement in cash flow performance and CSR implementation to reduce FD risks and support business sustainability, especially in the food and beverage sector.

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