Liquidity, Leverage, Institutional Ownership, And Financial Distress With Gender Diversity as Moderating Variable: Evidence From Indonesian Manufacturing Firms

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Abstract-*The purpose of this study is to collect empirical data on the influence of board gender diversity on the relationship between company performance and governance, and its impact on financial distress. Secondary data from the Indonesian Stock Exchange (IDX) annual financial reports of industrial enterprises for the period of 2019 to 2022 were analyzed. Thirty manufacturing enterprises met the requirements after the sample was selected through purposive sampling. The analysis of the data was done by multiple linear regression. The results show that institutional ownership and gender diversity on the board have no discernible impact on financial distress, while liquidity and leverage taken separately have a negative impact. Nonetheless, when considered collectively, institutional ownership, gender diversity on the board, liquidity, and leverage all have an impact on financial distress; in fact, gender diversity on the board can reinforce and magnify the effects of liquidity and leverage. This study contributes to the theoretical development of the Modified Altman Z-Score by incorporating gender as a moderating variable. The findings imply that gender effects should be considered when assessing a firm's likelihood of experiencing financial distress.*
Keywords: Altman Z-Score; Financial Distress; firm performance; Gender Diversity

1. INTRODUCTION

1.1 Research Background

Financial distress has recently become a famous topic in finance and financial health of firms as a crucial indicator for interested users to know more about company's performance in Indonesia, especially during the pandemic years. Financial distress can be defined as a condition where financial obligations are not met or are met with difficulty by a firm (Wu et al., 2008). Financially distressed firms are those having poor performance, inefficient producers, and also those likely to have high financial leverage and cash flow problems due to which firms lose their market value (Chan & Chen, 1991).

The issue of financial distress has gained prominence in finance, especially in Indonesia during the COVID-19 pandemic. Financial distress occurs when firms struggle to meet their financial obligations, leading to cash flow problems and loss of market value. In Indonesia, the

pandemic's economic disruptions, including the Large-Scale Social Restrictions (PSBB), reduced demand, revenue declines, and rising non-performing loans (NPLs), notably in the manufacturing sector, which experienced the highest NPL levels from 2019 to 2022. Manufacturing's contribution to Indonesia's non-oil and gas GDP dropped from 19.7% in 2019 to 18.34% in 2022, raising concerns due to the sector's significant role in employment and economic output.

This study uses the Revised Altman Z-Score developed by (Cındık & Armutlulu, 2021). This choice is based on the consideration that since its introduction by Altman in 1968, the Z-Score has been widely used in numerous studies in the US because this model was developed only using listed US companies as their sample. The applied studies have shown that in different countries' models lose their prediction power for the reason differences in economic conditions of each country (Karas & Srbová, 2019). The Revised Altman Z-Score was developed in the context of companies in Turkey, which the authors believe have similar economic and cultural environments, making it potentially suitable for use in Indonesia.

There are three factors estimated to influence financial distress; liquidity, leverage, and institutional ownership. The ability of these three performance-representing factors to effect financial distress is suspected to be reinforced by board gender diversity. If liquidity is deficit, it will impact several factors in the financial statements that also affect the Z-Score. First, is the value of working capital. Low working capital can affect the component X1, 'working capital to total assets,' in the Altman Z-Score formula, resulting in a lower final Z-Score. Second, low working capital can lead to decreased company profits, affecting component X3, 'EBIT to total assets,' thereby lowering the final Z-Score. Third, declining company profits result in lower retained earnings, impacting component X2, 'retained earnings to total assets,' thus further lowering the final Z-Score. Fourth, low retained earnings lead to lower total equity while increasing total liabilities. Low total equity combined with high total liabilities affects component X4, 'book value of equity to total liabilities,' in the Altman Z-Score formula, thus further reducing the final Z-Score. This aligns with the findings of Ikpesu, (2019), which show that liquidity significantly influences financial distress. However, the research by Dianova & Nahumury, (2019) indicates that liquidity does not affect financial distress.

Leverage is the second factor suspected of influencing financial distress, proxied in this study by the Debt to Equity Ratio (DER). A higher DER indicates a capital structure that relies more on liabilities, obligating the company to repay the principal and interest, which affects company profits and ultimately impacts the Z-Score (components X1, X2, X3, and X4).

Institutional ownership is expected to influence financial distress. Institutional investors have 3 control and can oversee decisions made by managers. This oversight can be exercised by institutional investors by placing their representatives on the board of commissioners. Consequently, institutional investor representatives on the board of commissioners can evaluate relevant activities conducted by management and supervise the company's management performance. The lower the percentage of institutional ownership, the less

capable institutional investors are of placing their representatives on the board of commissioners.

Gender diversity of the board is also estimated to affect financial distress. According to Carter et al., (2010), gender diversity of the board refers to the proportion of women serving on the board of directors. Gender diversity within the board supports the achievement of gender equality in the workplace, aligning with the Sustainable Development Goals (SDGs). “SDGs are global and national commitments to improving societal welfare, encompassing 17 goals, one of which is gender equality” (Badan Perencanaan Pembangunan Nasional, n.d.). While many studies have looked into how having women on company boards affects business success, the results are inconsistent. This is likely due to differences in cultural views on women, societal expectations, and government support for women in leadership roles from country to country. (Wang et al., 2024).

This study aims to investigate the relationship of liquidity, leverage, and institutional ownership on financial distress. Furthermore, this study also investigates the role of gender diversity as a moderating variable in the relationship between financial performance and financial distress. This study adds to the current body of literature by investigating how gender diversity on corporate boards affects a firm's financing decisions, particularly its capital structure policy. It addresses a gap in knowledge regarding the influence of gender diversity on financial outcomes within corporate boards.

1.2 Literature Review

1. Signaling Theory

   Signaling theory was first developed by Spence, (1973) to explain behavior in the labor market. Signaling theory is widely used in accounting, auditing, and financial management studies, explaining that management provides signals about the company through various aspects of financial information disclosure that investors can see as signals. For instance, signaling theory is related to financial distress where firms could be forced into bankruptcy if they default in honoring their debt obligations. Hence, increasing leverage has been suggested as one potentially effective signaling device (Akorsu, 2014). Financial ratios are used in analyzing financial statements, so the information in these statements serves as a signal from the company regarding its position and to determine whether financial distress is occurring..

2. Upper Echelon Theory

   The theory developed by Hambrick & Mason, (1984) suggests that the managerial background characteristics of top management partly predict organizational performance. From the perspective of this theory, the decision to choose a company strategy is influenced by the gender of top management.

   The right proportion of men and women is expected to create good synergy, leading to a better balance in the company's decision-making process and also women have different 4 human resources compared to men in general and different external connections to the environment, so Carter et al., (2010) estimate that women as board members will not have the same effect as men as board members. According to Fernando et al., (2020), women have a positive impact on improving company performance, which will reduce the potential for financial distress.

1.3 Research Framework

This study adopts a quantitative research approach, wherein numerical data are collected to address the research questions and statistically analyzed to test the proposed hypotheses. The research framework illustrates a model of financial distress (see Fig. 1), comprising three main variables: liquidity, leverage, and institutional ownership. Additionally, board gender diversity serves as the moderating variable influencing firm performance. Accordingly, this quantitative investigation examines the relationship between liquidity, leverage, and institutional ownership in relation to financial distress, with firm performance (represented by liquidity and leverage) moderated by gender diversity.

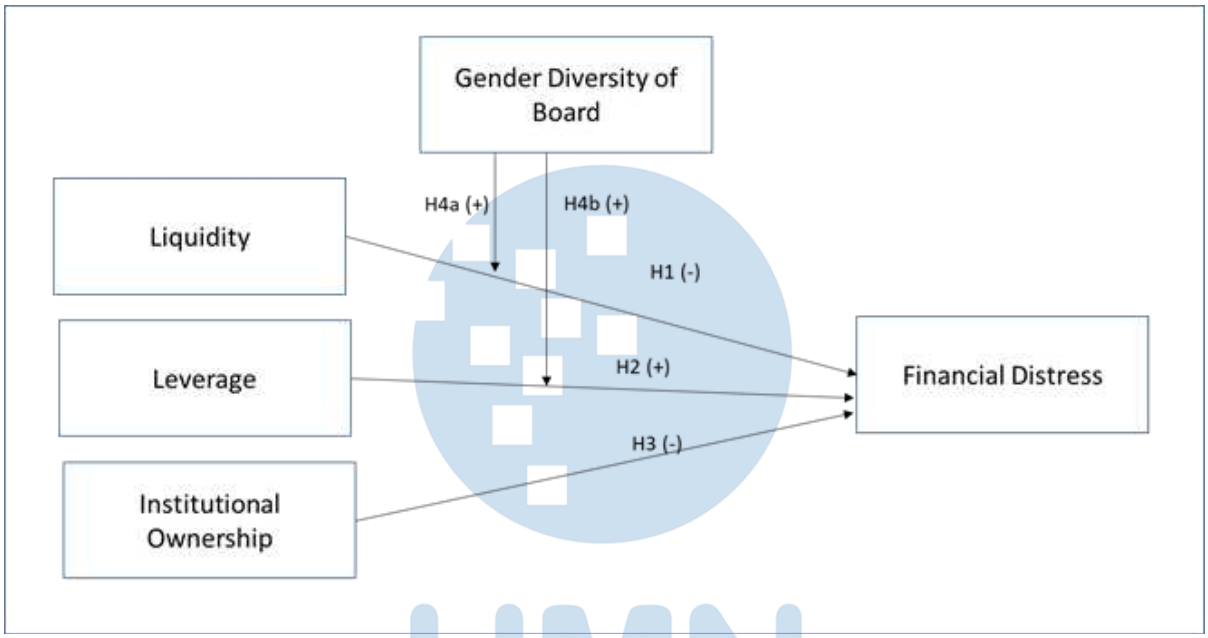


Figure 1. Research Model
Source: Author's data

There are several models to predict financial distress, namely Grover, Altman Z-Score, Springate, Zmijewski, and Ohlson. In this study, financial distress is proxied by the modified Altman Z-Score model of 1995. In this model, the variable X5 (sales to total assets) has been removed to minimize the potential impact of industry (Cındık & Armutlulu, 2021).

According to Cındık & Armutlulu, (2021), the discrimination zones for determining the condition of a company based on the modified Altman Z-Score model of 1995 are (1) if the Z value is greater than 2.60, it is classified as a non-bankrupt company (safe zone) (2) if the Z value is between 1.10 and 2.60, it falls into the grey zone (with a possibility of experiencing financial distress) and (3) if the Z value is less than 1.10, the company is in a difficult situation and falls into the high-risk bankruptcy zone (distress zone).

The current ratio, used as a proxy for liquidity in this study, measures a company's ability to settle its short-term obligations when due. If a company can meet its short-term obligations effectively, the risk of financial distress decreases, and it may indicates that liquidity has a negative impact on financial distress (Dianova & Nahumury, 2019). Conversely,

failing to utilize debt may increase the likelihood of financial difficulties (Ikpesu, 2019). Based on this discussion, an alternative hypothesis can be developed for this study:

Ha1: Liquidity has a negative significant influence on financial distress

Debt-financing may increase the risk of financial distress as managers are under less pressure to perform and the interest cost of debt increases as creditors require a higher risk premium (Ugur et al., 2022). Research by Oktari et al., (2023) shows that leverage has a positive impact on financial distress. Conversely, findings from studies conducted by Iqbal, (2015) indicate that high leverage can reduce financial distress due to its impact on minimizing the risk of financial difficulties that a company may face. Based on this discussion, the second alternative hypothesis for this study is:

Ha2: Leverage has a positive significant influence on financial distress

Ownership by institutional investors provides rigorous oversight functions and motivates management to enhance company performance. According to Elloumi & Gueyié, (2001), corporate management requires oversight functions with separation of corporate ownership. The greater the amount of shares held by institutional investors, the higher the level of professional external oversight. Strict oversight improves the financial condition of the company, thereby avoiding financial distress Saputra & Mawardi, (2022). Research by Widhiadnyana & Dwi Ratnadi, (2019), indicates that institutional ownership has a negative impact on financial distress. However, findings from studies by Dirman, (2020), and Liahmad et al., (2021) suggest that institutional ownership does not affect financial distress. Based on this discussion, the third alternative hypothesis for this study is:

Ha3: Institutional ownership has a negative impact on financial distress

Gender diversity on the board is a crucial aspect of corporate governance. A company's performance is believed to benefit from gender diversity, suggesting that having women on the corporate board can result in various financial advantages without negatively impacting shareholders' wealth. Board gender diversity primarily has an influence on the level of supervision done by the board of directors and ultimately the firm‘s financial performance (Limbasiya & Shukla, 2019). Whereas Campbell & Mínguez-Vera, (2008) stress that greater gender diversity leads to impressive outcomes in terms of economic gains. Past research suggests that the firm performance is positively impacted by the gender diversity on the board, resulting in financial gains without harming shareholders‘ wealth. Therefore, a firm shall maintain a proper mix of female and male directors on the board, rather than just appointing one female director to comply with the legal norm (Gordini & Rancati, 2017).

Considering the key role of board gender diversity in corporate governance and the strong and positive relation reported in the literature as well, board gender diversity is introduced as the moderating variable between all other explanatory variables of the present study and financial distress. Thus, the following hypotheses are proposed to test the board gender diversity moderating effect:

H4a: The relationship between liquidity and financial distress is moderated by board gender diversity

H4b: The relationship between leverage and financial distress is moderated by board gender diversity

2. RESEARCH METHODOLOGY

2.1 Methodology

The research model investigates the effect of liquidity, leverage, institutional ownership, and board gender diversity as independent variables on financial distress as the dependent variable. This causal approach is intended to provide empirical evidence regarding the direct relationships between the explanatory variables and financial distress, as well as to test the proposed hypotheses derived from prior theoretical and empirical studies.

Hypothesis testing in this study is conducted using multiple linear regression analysis with a moderating variable. The moderation analysis is applied to examine whether the moderating variable strengthens or weakens the relationship between the independent variables and financial distress. All statistical analyses, including descriptive statistics, classical assumption tests, and hypothesis testing, are performed using the Statistical Package for the Social Sciences (SPSS). The use of multiple linear regression with moderation is considered appropriate given the objective of assessing both direct and interaction effects among the study variables.

2.2 Population and Samples

The population of this study consists of all manufacturing firms listed on the IDX during the period 2019–2022. The sample was selected using a purposive sampling technique based on several predefined criteria. Specifically, the sampled firms are those experiencing financial distress, presenting audited financial statements for fiscal years ending on 31 December, and reporting their financial information in Indonesian Rupiah. The descriptive statistics of the samples are depicted in table 2.1.

Table 3.1 Descriptive Statistics

Variables	Observation	Mean	Standard Deviation	Min	Max
FDS	120	-5.715	11.831	-60.853	2.568
CR	120	0.872	0.639	0.051	3.445
LEV	120	-4.239	70.078	-753.541	114.289
INS	120	0.667	0.246	0.021	0.960
GEN	120	0.080	0.165	0.000	0.667

Source: Author's computation (2024)

Based on the results of descriptive statistics in Table 2.1, the average (mean) of the FDS variable is -5.714627, which means that the average sample company is in a condition of

financial distress because the average value (mean) is far below the safe limit value (safe zone) of financial distress. namely >2.60, in fact the average value is far below the gray zone value limit, namely 1.10 – 2.60. Then, the standard deviation value for the FDS is 11.8311657. Current Ratio (CR) has an average (mean) of 0.872446, which means that the average sample company has difficulty paying off its short-term obligations using current assets because the average (mean) CR value is below 1. Then, the standard deviation value in the CR variable is 0.6390287.

Leverage (LEV) has a mean of -4.239387, which means that on average the sample company has a liabilities that exceeds the amount of its equity, which indicates an unhealthy company condition. Then, the standard deviation value for the DER variable is 70.0784390. The institutional ownership (INS) has a mean of 0.667034, which means that 66.7034% of the average share ownership of the sample company is owned by institutions. Then, the standard deviation value for the KI variable is 0.2463382. Gender diversity of board (GEN) variable has a mean 0.080832, indicates that the proportion of women who serve on the board of directors for the average company sample is 8.0832%. Then, the standard deviation value for the GEN variable is 0.1647023.

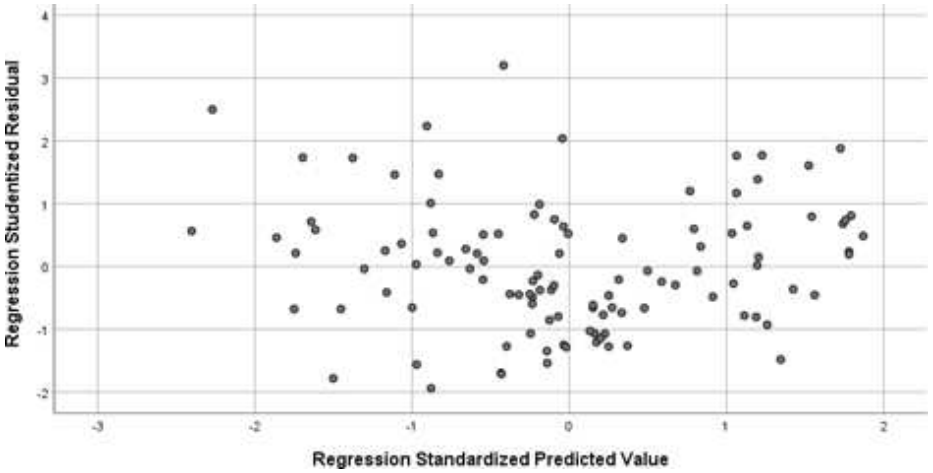
The subsequent analysis involved classical assumption testing to assess the suitability of the multiple linear regression model, the results of which are presented in Table 2.2.

Table 2.2 Normality and classical assumption test result

No	Test	Measurement	*Significance*	Result	Descriptions
1.	*Normality*	KS - Asymp Sig	>0.05	0.156	*Data is normally distributed*
2.	*Autocorrelation*	Runs Test	>0.05	0.176	*No autocorrelation*
3.	*Multicollinearty*	CR	>0.1 dan <10	0.735 & 1.361	*No multicolinearity*
		LEV	>0.1 dan <10	0.741 & 1.350	
		INS	>0.1 dan <10	0.866 & 1.155	
		GEN	>0.1 dan <10	0.865 & 1.156	
4.	*Heteroscedasticity*	Scatter Plot	<0.05	Sig>0.05 all variables	*No heteroscedasticity*

Source: Author's computation (2024)

Table 2.3 Heteroscedasticity Plot



Source: Author's computation (2024)

The results of the normality and classical assumption tests demonstrate that the data satisfy the required assumptions and are appropriate for multiple linear regression analysis.

3. RESULT AND DISCUSSION

The following are the results of multiple linear regression tests in 2 models. Model 1 is a model without moderation, while model 2 is a model after including interaction variables:

Table 3.1 Regression Result

Variables	Model 1		Model 2	
	t	Sig	t	Sig
CR	-5.2320	0.0000	-4.8990	0.0000
LEV	-4.6080	0.0000	-3.7000	0.0000
INS	-1.1100	0.2690	-1.2250	0.2230
GEN	0.8770	0.3830	1.2360	0.2190
CRxGEN			0.4150	0.6790
DERxGEN			-2.6240	0.0100
F-Statistic/Model fit	25.6130	0.0000	19.6500	0.0000
R Square	0.471		0.5130	

Source: Author's computation (2024)

In the analysis, Table 3.1 shows F-values of 25.6130 for model 1 and 19.6500 for model 2, both significantly higher than the F-table value of 2.46 at a 0.05 significance level, confirming that both models are fit. The significance values of 0.000 for both models indicate that the independent variables collectively have a significant impact on the dependent variable. From the t-test results in Table 3.4, it is found that liquidity negatively impacts financial distress,

aligning with previous research by (Hastiarto, 2021). This supports the hypothesis (Ha1) that liquidity reduces financial distress. Although leverage (LEV) also has a significance value below 0.05, Ha2 is rejected because leverage negatively affects financial distress. The negative Debt to Equity Ratio (DER) in many companies studied reflects accumulated losses exceeding equity. As DER improves from negative to positive, the likelihood of financial distress decreases, consistent with findings by (Oktari et al., 2023). The institutional ownership (INS) variable, with a significance value above 0.05, shows no effect on financial distress, rejecting Ha3. This aligns with (Dirman, 2020). Similarly, gender diversity on the board (GDB) also has no significant impact, as indicated by its high significance value, rejecting Ha4. This finding agrees with Maula et al., (2022), suggesting that gender diversity alone does not influence financial distress. The lack of impact from gender diversity indicates that preventing financial distress requires more than gender characteristics; women on the board must possess the skills and competencies necessary to contribute effectively to strategic decisions that enhance company performance and mitigate the risk of financial distress.

To prove whether the Gender Diversity of Board variable can strengthen the influence of CR and LEV on financial distress, additional testing was carried out using two-step linear regression which resulted in a comparison of the coefficient of determination before and after entering the moderating factor with the following results:

Table 3.2 Regression with moderating variables

Model #	R^2 No Moderating	R^2 With Moderating
1	0.359	0.386
2	0.330	0.392

Source: Author's computation (2024)

It can be concluded from the stepwise regression test above, first, GEN can strengthen the influence of CR on FDS because the coefficient of determination (R2) increases from 0.359 to 0.386 after entering the interaction variable. Both GENs can also strengthen the influence of LEV on FDS because there is an increase in the coefficient of determination (R2) from 0.330 to 0.392. Thus H4a and H4b are accepted.

4. CONCLUSION

4.1 Conclusion

The finding of this study pose companies with low liquidity (CR) and low leverage (DER) can increase the likelihood of financial distress in manufacturing companies. Thus, to avoid financial distress, companies need to pay attention to increasing income and expense efficiency. This can prevent company losses and increase profits. An increase in profits can cause an increase in the value of retained earnings which can also cause an increase in total equity and prevent negative total equity from occurring. Then, an increase in profits can also cause an increase in current assets. Having high current assets and total equity that is not negative can prevent the company from the risk of default which is a factor in financial distress.

The present study bears noteworthy consequences, contributing to the extant body of knowledge and facilitating policymakers' comprehension of the significance of gender diversity on boards in Indonesia. The results underscore the necessity of instituting a suitable proportion of men to women on corporate boards, something that is presently absent in contrast to other industrialized and developing countries. The report also emphasizes how gender diversity can support the financial performance of the firm. The results suggest that, 15–25% of female members should be appointed as directors, either executive or non-executive. In the long run, this ensures a favorable impact on company value by acting as a positive mediator between board qualities and firm value, even though it may have a short-term negative effect..

4.2 Implication/Research Limitations

The limitation of the present work also concern a number of factors including the small number of independent variables included in it, whose larger value coefficient'determination varies between 40 and 50%. This suggests that other confounding variables may need to be included in future studies. Moreover, as this study examines the relationship between board gender diversity, firm performance, and financial distress in the Indonesian setting; hence this cultural perspective with respect to gender diversity is unique to Indonesia.

However, its impact on firm performance is likely to vary between countries because of variation in cultural values underlying the policy settings. Therefore, it is hoped that future research will be able to compare these different concepts of gender diversity and explore the differences in more detail.

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