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Leverage, profitability, liquidity, and bond ratings: Testing the effects of company size interactions

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ABSTRACT

Bond ratings are a source of legal insurance for investors in reducing the possibility of default risk and measuring the risk of traded bonds. In this research, we examine the influence of leverage, profitability, liquidity, and company size as moderating variables on the ratings of bonds listed on the IDX. This type of research is casual with the population being manufacturing companies registered on the IDX from 2018 to 2022. Meanwhile, the research sample was determined using a purposive sampling method so that 20 sample companies were obtained. The data analysis techniques used in this research are descriptive statistical analysis, logistic regression analysis, simultaneous tests, and partial tests. Based on data processing using logistic regression, it is proven that leverage and profitability influence bond ratings with positive results. At the same time, liquidity does not significantly influence bond ratings. Leverage and liquidity, after being moderated by company size, do not significantly affect bond ratings, while profitability moderated by company size has a significant effect on bond ratings.

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1. INTRODUCTION

Apart from issuing shares, the company also issues bonds as company funding. Bonds are mediumterm and long-term debt securities that can be traded. Bonds require the party issuing securities to pay compensation coupons within a specific time and pay off the principal at the end of the specified time to the party purchasing the bonds. Bonds are fixed-income securities investments that aim to provide a relatively stable growth rate of investment value with relatively more stable risks compared to shares. Bonds are letters of acknowledgment of debt issued by the government, company, or other institution as the debtor, with a specific nominal value and the ability to pay interest periodically based on a certain fixed percentage (Novtaviani & Oetomo, 2019) Bonds are medium-to-long-term transferable debt securities, according to the Indonesian Stock Exchange. The entity that issues the bond guarantees the purchaser compensation in the form of interest over a specified period and the principal at a predetermined time. As a part of Fixed Income Securities (fixed income) products, bonds are an alternative to financing or investment instruments that provide investors with a predetermined income value and period (Putri et al., 2019).

Corporate bonds are bonds issued by companies. Corporate bonds have a risk of default if the issuing company experiences problems; the company may not be able to make payments on

interest and principal as promised. Bonds can estimate the income that will be received because, in the contractual agreement, the rights that the bondholder will receive are determined. Bond income can be predicted so bondholders can support a better portfolio than a stock portfolio.

Bond ratings are character symbols given by rating agents to indicate the risks of bonds (Febriani, 2017). Bond ratings are critical to investors investing their funds in bond securities. Bond ratings can be used to measure the risk of traded bonds. Usually, a significant bond rating will be accompanied by lowinterest returns. Conversely, the lower the bond rating, the greater the risk of default. The corporate will offer greater returns to attract investors. Bond ratings can be influenced by several factors, including in this research using the Leverage variable, which is proxied using the Debt Assets Ratio; Profitability, which is represented by Return on Assets; liquidity by the currency ratio; and the company's magnitude. A bond rating assesses the debtor's financial health and the potential course of action regarding the held debt. A bond rating is a risk scale of all traded bonds(Aswir & Misbah, 2018). It can be said that the rating tries to measure the risk of default, namely the chance that the issuer or borrower will experience a condition of being unable to fulfill financial obligations. This rating aims to provide an opinion (independent, objective, and honest) regarding the risk of debt security. Bond-buying investors will consider the credit quality the bond rating represents as a surrogate. The principal and interest payments' punctuality is reflected in the bond rating, which quantifies the risk associated with the traded bonds. The risk scale of a bond indicates the degree of investor protection it offers. The security is determined by the capacity of the bond-issuing company to remit interest on the principal. The risk of default is more excellent for bonds with a low rating than those with a high rating. Bonds must be given a rating by a bond rating agency with the aim of providing risk scale information about the security of a bond for investors.(Mauludina & Nurdin, 2022).

Rating agencies carry out the process of assigning ratings to bonds. One of them is PT. Pefindo (Indonesian Securities Rating). Bond rating companies provide bond rating results in several symbols, each with a different meaning. The ranking results are obtained from qualitative and quantitative data on bond issuers, including various financial ratios from previous years. Bond ratings can help investors' performance in assessing debt and bond default risk. Bond ratings attempt to quantify the issuer's potential insolvency as a debtor, explicitly concerning the payment of interest throughout the bond's term and repayment by the maturity date (A. G. Z. S. Ningsih & Arifin, 2022).

Investors who invest in bonds may face default risk, capital loss, and callability. The risk of potential losses resulting from the issuer's inadequate ability to repay principal and interest on bond loans is called default risk. A capital loss is a loss suffered by investors caused by bonds sold before maturity at a price lower than the purchase price. Callability is the bond issuer's repayment before maturity because of the issuer's rights, namely the right to buy back the bonds that have been issued (Herlinasari, 2021).

One of the most significant risks in bond investment is the risk of default, which has the potential to cause no return on investment value due to financial distress faced by the issuer, so bond rating analysis is essential. Investments will try to find information Concerning Rating Fluctuations as an Indicator of the Issuing Company's Health. Thus, issuers must consider what variables can influence bond ratings to optimize themselves when planning to issue bonds. A high rating also impacts lower coupon rates, reducing the company's capital cost. A high rating means that companies can enjoy higher quality sources of financing with relatively low interest fees (coupons) (Wendy & Sianturi, 2017).

Before trading, bonds must follow a rating process. Bond ratings will be issued to assess company performance. The two largest rating agencies in the world are Moody's and Standard and Poor's. Meanwhile, rating agencies in Indonesia include PT. Indonesian Securities Rating (PEFINDO), PT. Kasnic Credit Rating Indonesia, and PT. Fitch Ratings Indonesia. This research uses bond ratings issued by PT PEFINDO because this agency publishes bond ratings monthly. The number of companies that use this service is much more excellent than other rating agencies, so this research uses bond ratings issued by PT Pefindo (Mauludina & Nurdin, 2022).

PT. Indonesian Securities Rating (Pefindo) is Indonesia's oldest and most trusted rating company. Pefindo was founded on December 21, 1993, based on the Financial Services Authority

and Bank Indonesia initiative. Pefindo is the only securities rating company owned by domestic shareholders and has rated many companies and debt securities traded on the Indonesia Stock Exchange. Bond ratings can be categorized into two categories based on the rating value determined by PEFINDO: investment quality (BBB, A, AA, and AAAA), which designates companies deemed to possess sufficient resources to fulfill their payment obligations and not of investment quality categories (BB, B, CCC, and D) are deemed unsuitable for investment by investors (Yuliani et al., 2023).

The first independent variable identified as capable of explaining the bond rating variable is the Leverage ratio. According to (Darmawan et al., 2020). the Leverage ratio determines how much The business can meet its short-term and long-term obligations. As a surrogate for the leverage ratio, the debtto-assets ratio is utilized. To determine a business's ability to fulfill its financial commitments, the DAR is computed by dividing its aggregate debt by its total assets. A high leverage value can indicate that the company has debts more significant than its assets, so the risk of default borne by investors in the company is more elevated. This can affect the bond rating that will be given. The Leverage Ratio is a comparison used to measure the extent to which a company's assets account for the cost of its liabilities (Setiawati et al., 2020).

Profitability ratios can also influence bond ratings. According to (Fikriyah, 2018). The profitability ratio assesses an organization's capacity to produce profits concerning its revenue, total assets, and internal funds. The metric used to denote this ratio is Return on Assets (ROA). ROA is a ratio used to measure the rate of return on total assets. The purpose of choosing ROA is to consider the reasons that with this ratio, it can be seen whether the company has utilized the assets it owns well to generate profits. Elevated profitability may serve as an indicator of a business's capacity to remit its debts. If the profitability of the bond issuer has increased, it will have a good rating so its obligations can be settled with the money made from its revenues. The company's bond rating will rise as a result. This ratio reflects the company's acceptance of good investment opportunities and effective management. If a company's ROE is high, then the company has been effective in managing its capital, so it will invite investors' confidence to invest in the company (Indi, 2018).

Apart from that, there is a Liquidity Ratio. Liquidity ratios assess the capacity of an organization to meet its immediate financial obligations. As the organization's liquidity grows, the higher the bond rating that the business acquired will be (Hasan & Dana, 2018). This liquidity ratio describes the ability of the business to repay its debt at maturity. If a company experiences financial difficulties, the company begins to be slow in paying bills (debts), bank loans, and other obligations. It can be deduced from the abovementioned viewpoints that the liquidity ratio compares the company's current liabilities to its total assets. This ratio illustrates the organization's ability to fulfill its financial obligations on time. Companies that are liquid and have larger current assets compared to current liabilities, it will be able to meet its short-term obligations on time (Fitriani et al., 2020)

Based on the controversy over the influence of leverage, profitability, and liquidity variables on bond ratings, it is suspected that there are moderating variables that strengthen and weaken the relationship between these variables. The moderating variable in this research is company size. According to (Safitri et al., 2020) The size of a corporation is a defining attribute of its organizational structure. Investors assess a company's capacity to make periodic bond interest payments and principal repayments based on its scale, elevating its bond rating. Company size can be measured using total assets, sales, and equity (Oktavianti et al., 2020). Large companies are considered to have sufficient wealth to pay off their financial obligations. This can signal to investors that large companies have a better ability to fulfill their obligations to bondholders than small companies, so investors will have more confidence if they buy the company's bonds because strong investor confidence will cause the company's reputation to improve and drive the bond rating to increase (Darma & Sulistiyani, 2019).

Some research results (Pangestuti et al., 2022) showed that the activity ratio and market value significantly negatively affected financial businesses' bond ratings, whereas leverage did not exhibit a powerful influence. Other research conducted by (Hidayat, 2018) demonstrates that while liquidity has a crucial and positive impact on bond ratings, leverage has a negative and

considerable impact on those ratings. The study (Fikriyah, 2018) shows that the liquidity and profitability variables do not significantly influence bond ratings, while size significantly influences bond ratings. Research acc (Setiawati et al., 2020) the profitability factors possesses a noteworthy and favorable effect on the bond rating. In contrast, neither leverage nor firm size exhibit a statistically significant influence on bond ratings. Due to the discrepancy in findings among these studies, which indicates a research vacuum, additional investigation is warranted concerning the variables that impact the bond ratings of Indonesia Stock Exchange-listed manufacturing firms. The research (Wibowo & Linawati, 2020) results show that return on assets, return on equity, and debt to equity do not have a significant effect on bond ratings, while debt to assets have a significant effect on bond ratings. According (W. S. Ningsih et al., 2021), research shows company growth and profitability together has an influence on bond ratings.

Theoretical implications are tested and developed in this research it is hoped that it can contribute to our understanding of the factors that can influence bond ratings, namely leverage, profitability, liquidity and company size. This research found that the variables profitability, leverage, liquidity and company size are factors that determine a company's bond rating. The results of the research show that profitability has a positive effect on bond ratings so that it reflects that the company being measured is becoming more effective in generating profits and the company is considered to have the ability to pay off loan principal and pay interest.

Based on the problem formulation and conceptual framework above, the research hypothesis presented by the researcher is as follows: H1 Leverage has a positive effect on bond ratings, H2 Profitability has a positive impact on bond ratings, H3 Liquidity has a negative impact on bond ratings, H4 Company size moderates the impact of leverage on bond ratings, H5 Company size moderates the effect of profitability on bond ratings,H6 Company size moderates the effect of liquidity on bond ratings.

2. RESEARCH METHOD

research uses associative causality research to determine the relationship between two or more variables. The type of relationship in this research is causal because it aims to ascertain the consequence of the independent variable influencing the dependent variable. This is a quantitative study involving a population of food manufacturing companies. As many as 26 corporate in the beverage industry, according to BEI, are listed as having issued bonds. Meanwhile, the research sample was observed utilizing a purposive sampling technique with alliances from 20 food and beverage manufacturing companies ranked by PEFINDO as the criterion during the 2018-2022 period. Sampling criteria can be seen in Table 1.

The researchers took the population from manufacturing firms operating in the food and beverage industry, as this sector continues to serve as the foundation for manufacturing expansion. The subsector of food and beverages is becoming progressively more competitive because it has a large number of companies, and not many only have large-scale companies but have reached the small and medium industrial class level, with its developments making investors interested in directing their investments or making investments in food and beverage subsector companies. This research uses logistic regression to test research hypotheses developed through two stages of testing. In the first stage, the research model was evaluated using descriptive statistical analysis, the f-test, and the t-test; in the second stage, the research model was assessed using equation two and company size as a moderating variable.

Table 1. Sample Selection Stage

No	Sample Criteria	Amount
1	Manufacturers in the food and beverage subsector that were listed on the IDX between 2018 and 2022	26
2	Financial Reports expressed in USD	(4)
3	Financial Reports are not 5 years in a row	(2)
	The target population is taken as a sample	20
	Year of observation	5
	Total observations	100

This research tests two research models, the first by ignoring the effect of Company Size (SIZ) and the second model by involving SIZ. The two models are presented in equations one and two.

$$BondRit = \alpha + \beta1.DARit + \beta2.ROAit + \beta3.CRit + \varepsilon it \quad \text{Model (1)}$$

$$BondRit = \alpha + \beta4.DARit + \beta5.ROAit + \beta6.CRit + \beta7.SIZit + \beta8.DAR*SIZit + \beta9.ROA*SIZit + \beta10.CR*SIZit + \varepsilon it \quad \text{Models (2)}$$

Information:

BondRit	= Bond Ratings
α	= Constant
DARit	= Leverage
ROAit	= Profitability
CRit	= Liquidity
SIZit	= Company Size
εit	= Residual

3. RESULTS AND DISCUSSIONS

Descriptive Analysis

According to data processed utilizing IBM Statistics 25, descriptive analysis data is obtained as a description of the statistical data from the samples that have been collected. Descriptive analysis used each research variable's average, minimum, maximum, and standard deviation.

Table 2. Typical Statistical Results

	N	Range	Minimal	Maximal	Sum	The Median	Standard Deviation
Leverage	100	9866	979	10845	434180	4341.80	2098,412
Profitability	100	6396	-2157	4239	62693	626.93	1026.675
Liquidity	100	127945	5146	133091	2639491	26394.91	26060.430
Bond Ratings	100	1	0	1	81	.81	,394
Company Size	100	75162	253102	328264	28028482	280284.82	16296.705
Valid N	100						

The Leverage variable, which is measured using the Debt to Assets Ratio (DAR), based on the sample studied, obtained a total of 434180, with the lowest value being 979, the highest value being 10845, and an average of 4341.80 and having a difference of 9866 and a standard deviation, Which is worth 2098,412. The Profitability variable, which is measured by Return on Assets (ROA), has a total of 62693, with the lowest value being -2157, the highest value being 4239, an average of 626.93, and a difference of 6396 and a standard deviation of 1026.675. The Liquidity variable, which is measured using the Current Ratio, has a total of 2639491 with the lowest value of 5146 and the highest value of 133091 with an average of 26394.91, a difference of 127945 and a standard deviation value of 26060.430. Meanwhile, the Bond Rating variable has a total of 81, has the lowest value of 0 and the highest value of 1 with an average of 0.81, and has a difference of 1 with a standard deviation of 0.394. Furthermore, the Company Size variable has a total of 28028482, with the lowest value being 253102 and the highest value being 328264, having an average value of 280284.82 and a difference of 75162 with a standard deviation of 16296.705.

Logistic Regression Analysis Test Results, coefficient of determination, and F test

Logistic Regression Analysis is one of the analytical methods used to model the relationship between independent variables and the dependent variable. Logistic regression analysis can help to understand the factors that influence the dependent variable and how much

influence the independent variable has on the probability of the desired outcome occurring. The following are the results of processing the logistic regression test with the prepared data:

Table 3. Results of Testing Research Models

No	Variable	Model-1	Model-2
1	Constant	1,039	0.280
	P-value	(0.000)	(0.935)
2	SIZE	-	2,910
	P-value		(0.815)
3	DAR	-7,519	0,000
	P-value	(0.000)	(0.773)
4	ROA	0,000	0.002
	P-value	(0.000)	(0.000)
5	CR	-1,210	-8,265
	P-value	(0.399)	(0.247)
6	DAR*SIZE	-	-7,614
	P-value		(0.658)
7	ROA*SIZE	-	-8.152
	P-value		(0.000)
8	CR*SIZE	-	2,914
	P-value		(0.256)
9	F	33,241	13,452
	P-value	(0.000)	(0.000)
	Adjusted R^2	0.494	0.553

Table 3 presents the test results for the two models tested in this research. Model-1 tests the influence of leverage, profitability, and liquidity on bond ratings, the proportion size in the coefficient of determination test, and the simultaneous test (F). Model 2 explains the results of testing the moderating effect of company size (SIZE), testing the proportion size through the coefficient of determination and F-test.

The Model-1 test results indicate that bond evaluations are not significantly impacted by any variable other than liquidity (CR). The other two predictors, Leverage (DAR) and Profitability (ROA) show a positive influence at the five percent significance level. This indicates that the variables in the regression model have good results in explaining bond rating variables. The research model also has a very good goodness of fit test with a significance level below five percent in the F-test. Apart from that, in terms of the coefficient of determination, the test results also support the F-test, where the Adj-R2 value is 49.4%. The results of the moderation effect test in model-2 show support for company size as a moderator. This test involves variables that interact with SIZ. The interaction results indicate that SIZ weakens the influence of leverage and liquidity variables on bond ratings (significance level above five percent). Meanwhile, for the profitability variable (ROA), the interaction results indicate that SIZ strengthens the influence of the profitability variable on the obligation rating (significance level below five percent).

Model-2 also explains the feasibility test of the model through the coefficient of determination, and the F-test shows that after involving SIZ, the research model remains consistent with good results. The coefficient of determination increased to 55.3% (previously 49.4%), while the F-test results supported the variables (the significant level below five percent). These results also confirm that the level of goodness of fit of the model test for the interaction model is outstanding.

Hypothesis Test Results (T)

In testing the moderation equation hypothesis in this research, Leverage moderated by Company Size, Profitability moderated by Company Size, and Liquidity, which Company Size moderates, are included in the independent variables, while bond rating is the dependent variable. The partial test results are given in Table 2. The T-test was conducted using the following criteria: a) Ha is disqualified, and H0 is allowed if the probability number is more significant than, 0.05, indicating that the independent variable has no bearing on the dependent variable. b) If the

probability value is less than 0.05, Ha is accepted, and H0 is ignored. This suggests a definite relationship between the independent and dependent variables.

The findings of the partial test of the moderation equation in this study are as follows: Bond ratings are positively impacted by leverage, with the t coefficient value of the influence of leverage on bond ratings of -4,157 with a significance of 0.000 (probability <0.05). This shows that leverage, as proxied by the Debt to Assets Ratio (DAR), exerts a substantial and favorable impact on bond ratings (H1 is accepted). Furthermore, Profitability influences positively because the tcoefficient value of the influence of profitability on bond ratings is 7,000 with a significance of 0.000 (probability < 0.05). This shows that profitability, as proxied by Return on Assets (ROA), possesses a substantial and favorable impact on bond ratings (H2 is understood). Bond ratings are not positively impacted by liquidity, as indicated by the analysis outcomes, which show that the tcoefficient value of the influence of liquidity on bond ratings is -0.848 with a significance of 0.399 (probability > 0.05). This indicates that there is no positive relationship between liquidity (represented by the Current Ratio (CR)) and bond ratings (H3 is refuted). There is no moderating effect of company scale on leverage's impact on bond ratings; the t-test findings indicate that leverage's coefficient value on bond ratings is -0.445 with a significance of 0.658 (probability >0.05). Thus, it can be concluded that the company scale does not serve as a moderating variable in the connection between bond ratings and leverage. (H4 is rejected). Size of the company might moderate the influence of the profitability variable on bond ratings. The findings from the t-test analysis indicate that the profitability coefficient on bond ratings is -3.784 with a significance of 0.000 (probability <0.05), so it can be said that the moderating variable of company size is a strengthen the connection between profitability and bond ratings. (H5 accepted). The t-test analysis findings indicate that Business size doesn't moderate liquidity's impact on bond ratings. Specifically, the liquidity coefficient value on bond ratings is 1,142, with a significance level of 0.256 (probability > 0.05), so it can be said that the moderating variable of the size of the company does not affect the correlation between liquidity and bond ratings (H6 is rejected).

4. CONCLUSION

In light of the preceding analysis and discussion, it can be concluded that leverage variable is positive and meaningful. The profitability variable exhibits a statistically significant and positive impact on bond ratings. Conversely, the liquidity variable fails to influence bond ratings significantly. Meanwhile, Based on the significant value of the interaction variable between leverage and company size, it can be inferred that the company size variable does not moderate the influence of the leverage variable on bond ratings. However, this conclusion is not supported by the significant value of the interaction variable between profitability and company size, which suggests that the profitability variable can moderate the influence of the leverage variable on bond ratings. The significant value of the interaction variable between liquidity and company size concludes that the company size variable cannot moderate the liquidity variable's influence on bond ratings.

The theoretical model tested and developed in this research it is hoped that it can contribute to our understanding of the factors that can influence bond ratings, namely leverage, profitability, liquidity and company size. In this way, researchers can provide implications for related parties, namely that companies that will issue bonds can pay attention to the company's level of profitability. High level of company profitability will raise the company's bond rating.

Based on this study, several recommendations can be concluded as follows. First, Pefindo, one of Indonesia's bond rating agencies, needs to study these variables more deeply so that bond ratings can be analyzed comprehensively. Second, this research only uses low and high categories in analyzing bond ratings so that the observed value of bond ratings is not very varied. Third, future researchers can consider adding other variables besides those in this study.

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