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**Profitability, Leverage, Liquidity and Bond Age On Bond Rating**

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**[ECO] Submission Acknowledgement**

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## Profitability, Leverage, Liquidity and Bond Age On Bond Rating

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INFORMASI ARTIKEL	<b>ABSTRACT</b> (10pt, Times New Roman, English)
<p><b>Histori Artikel:</b> Diterima xxxx, 20xx Direvisi xxxx, 20xx Diterbitkan xxxx, 20xx</p>	<p><i>The rating of a bond becomes a guideline in purchasing bonds. The purpose of this study was to determine the effect of Profitability, Leverage, Liquidity, and Bond Age on Bond Ratings in Public Companies Listed on the IDX for the 2017-2018 period. The sample consisted of 34 companies using purposive sampling technique and analyzed using logistic regression data analysis. The results of this study indicate that simultaneously Profitability, Leverage, Liquidity and Bond Age have a significant effect on Bond Ratings while Profitability and Leverage partially have a significant effect on Bond Ratings, but Liquidity and Bond Age partially have no significant effect on Bond Ratings. The use of Logistics analysis is a novelty of this research because variable Y has a limited value/ordinal scale. Liquidity and bond age which are generally used as the basis for making decisions to buy bonds,</i></p>
<p><b>Keyword:</b> Bond Rating Profitability Liquidity leverage Bond Age</p>	
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### Introduction

The capital market is a transaction market for various long-term financial instruments that can be traded, including debentures, stocks, mutual funds, derivative instruments and even other instruments. The capital market is a means of funding for companies and other institutions (eg government, private sector) and as a means of investment activity. In the capital market, the long-term instruments traded are bonds, stocks, warrants, rights, mutual funds and many other derivative instruments such as futures and options.

Investment is an activity to place funds in one or more than one asset for a certain period with the hope of obtaining profit or income or increasing the value of the initial investment (capital) which aims to maximize return in the future (Tandelilin, 2017). A bond is a long-term debt instrument or also known as a long-term contract in which the borrower agrees to pay interest and principal, on a certain date, to the holder of the bond.(Brigham & Houston, 2018).

Bonds are one of the most attractive financial instruments for investors in the capital market or for companies to obtain funds for the benefit of the company (Rahardjo, 2003). Bonds are rated by a bond rating agency which provides risk scale rating information as an indication of the extent of security of a bond for investors. The benefits of issuing bonds that are obtained from companies are information on business position, determining the structure of bonds, supporting company performance, as a marketing tool, and maintaining investor confidence

SNP Finance's rating dropped drastically from idA to idCCC with its six MTN series and received a credit watch outlook with negative implications due to its MTN default case. This prompted researchers to

conduct research related to bond rating by using financial factors, namely profitability, leverage, and liquidity as well as non-financial factors, namely the age of the bonds.

Return on Equity as a proxy for profitability is a ratio for measuring net profit after tax with own capital (Kasmir, 2016). This ratio shows the efficient use of own capital. The higher this ratio, the better. This means that the position of the owner of the company is getting stronger, and vice versa. Then the bond issuer is considered to have a good rating because the profit earned can be used to pay off its debts. According to the results of research conducted by Faradi & Supriyanto (2015) and Pramesti, (2022) concluded that the variable profitability has an effect on bond ratings. As well (Aluman et al., 2022). From the above definition it can be concluded that Return On Equity (ROE) is a financial ratio to measure a company's ability to earn profits (return) by comparison between profit after tax and own capital.

H1 = It is suspected that profitability has an effect on bond ratings

According to Harahap (Harahap, 2018) Leverage ratio is a ratio that measures how far a company is financed by liabilities or external parties with the company's ability as described by equity. According to (Faradi & Supriyanto, 2015) This ratio is used to measure the extent to which a company uses debt to finance its investment. The higher or lower the value of the leverage ratio means that only a small portion of assets are funded with debt and the smaller the risk of company failure, and vice versa the lower the company's leverage, the higher the rating of a company. Companies with low levels of leverage tend to be favored by investors because investors have confidence that the company will be able to pay off all of its obligations when the debt is due. (Septyawanti, 2013). According to the results of research conducted by Suharli (2008) concluded that the leverage ratio has a significant effect on bond ratings. Although on the other hand (Pramesti, 2022) shows that leverage has no effect on bond ratings, as well as on (Faradi & Supriyanto, 2015) which shows that there is no effect of capital structure on bond ratings. The difference in research results raises special interest for researchers to look further at the relationship between leverage and bond ratings, with the following hypothesis: H2 = It is suspected that leverage has an effect on bond ratings

Liquidity is the company's ability to meet short-term financial obligations on time (Sutrisno, 2013). Results of research by Hung et al., (2021) concluded that liquidity can have a significant positive effect on bond ratings, as well as (Faradi & Supriyanto, 2015) which shows the results of liquidity have a significant effect on bond ratings, although on the other hand (Aluman et al., 2022) shows a negative and significant effect. According to the significance of the results of the study by Hung et al., (2021), because manufacturing companies that have high liquidity mean that their current assets are greater than their current liabilities, so that if at any time there is a change in economic or financial conditions, these current assets can be used to fulfill the company's obligations related to bonds at maturity. So that liquidity is expected to be able to affect a company's bond rating if the level of liquidity is high because by paying off its short term, the company is also expected to be able to pay off its long term obligations (bonds payable).

H3 = It is suspected that liquidity has an effect on bond ratings

The maturity of the bond (maturity) is the date on which the bondholder will receive payment of the principal or nominal value of the bond held (Brigham & Ehrhardt, 2017). Bond maturity periods vary from 365 days to over 5 years. According to Almilia & Devi (2007) the short life of the bond actually indicates an investment grade bond rating. In general, the longer the maturity of a bond, the greater the level of uncertainty so that the greater the maturity risk and conversely, the shorter the maturity of the bond, the better the rating of the bond.

H4 = It is suspected that the age of the bonds has an effect on the rating of the bonds

One of the bond rating agencies is PT. PEFINDO (Indonesian Securities Rating Agency). PT. PEFINDO was established in Jakarta on December 21, 1993 on the initiative of BAPEPAM and Bank Indonesia. The main function of PT. PEFINDO is to provide an objective, independent and trustworthy rating of credit risk (credit risk) of debt securities (debt securities) publicly. PEFINDO has an affiliation with an international rating agency, namely S&P (Standard & Poor) and is active in ASEAN Forum of Credit Rating Agencies (AFCRA) activities to improve the quality rating network.

## Research methods

The population in this study are all companies that issue bonds and are listed on the Indonesia Stock Exchange in 2017-2018. This study used a purposive sampling technique for determining the sample, which is a form of non-random or non-probabilistic sampling method in which the sampling method is carried out by selecting subjects based on specific criteria set by the researcher. The population used as the sample is the population that meets the following criteria used in sampling: 1) All public company bonds outstanding for 2 years in the period 2017-2018 and are listed on the Indonesia Stock Exchange. 2) All bonds are bonds issued by publicly listed companies that publish annual financial reports for the 2017-2018 period. 3) All corporate bonds are rated by PT. PEFINDO. 4) Using the rupiah currency in the presentation of financial statements. Based on data on the Indonesia Stock Exchange, the total population is 76 public companies on the IDX in 2017-2018. The number of samples that meet the requirements is that there are 34 public companies that fit these criteria.

The analysis technique in this study was tested using a logistic regression model because the dependent variable is a dummy variable. The logistic regression model can be estimated, using the following methods: a) Regression Model Feasibility Method, Hypotheses to assess model fit:  $H_0$  = The hypothesized model is fit with the data, and  $H_a$  = The hypothesized model is not fit with the data With the following decision: Value of goodness of The fit test as measured by the chi-square value on the Hosmer and Lemeshow test is: If the probability is  $> 0.05$  then  $H_0$  is accepted and  $H_a$  is rejected, and if the probability is  $< 0.05$  then  $H_0$  is rejected and  $H_a$  is accepted. b) Statistical Value  $-2\text{LogL}$ . Assess the  $-2\text{LogL}$  number at the beginning (block number = 0) and  $-2\text{LogL}$  number in block number = 1, if there is a decrease in  $-2\text{LogL}$  number then it shows a good regression model. The log likelihood in logistic regression is similar to the meaning of "sum of squared error" in the regression model, so a decrease in the log likelihood indicates a good regression model. c) Value of Nagelkerke's R Square. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression.

## Results and Discussion

The Hosmer and Lemeshow test. To find out the difference between predictions and observations, the Hosmer and Lemeshow test and the Chi Square approach were used. According to (Ghozali, 2013), if the Hosmer and Lemeshow values are equal to or less than 0.05, then the null hypothesis is rejected, which means that there is a significant difference between the model and the observed values so that the Goodness Fit Model is not good because it cannot predict the observed values. The results of the Hosmer and Lemeshow Test can be seen in the following table:

Table 1

Hosmer and Lemeshow Test			
step	Chi-square	Df	Sig.
1	.838	8	.999

Source: Results of Data Processing (2023)

Based on table 1, the results of testing the similarity of the predictions of the logistic regression model with observational data show that the Chi-square value is 0.838, with a significant value of 0.999. The

significant value is greater than 0.05 ( $> 0.05$ ), so there is no difference between the predictions of the logistic regression model and the observed data. This means that the logistic regression model can be accepted because the model is in accordance with the observations.

Table 2

Iteration History<sup>a,b,c,d</sup>

Iterations	step	-2 log likelihoods	Coefficients				
			Constant			Age Bond	
			ROA	DER	CR		
1	90,682	1,550	1943	071	-.062	.011	
2	63,378	1,714	6,215	.214	-.111	.033	
3	52,152	.660	18038	.508	-.062	.074	
4	46,062	-.984	37,681	.836	.017	.163	
5	44,409	-1,959	49,599	1050	.046	.257	
6	44,192	-2,357	53,053	1,194	.056	.294	
7	44,181	-2,449	53,294	1,247	.060	.300	
8	44,181	-2,457	53,296	1,252	.060	.300	
9	44,181	-2,457	53,296	1,252	.060	.300	

Source: Results of Data Processing (2023)

Classification Matrix Test. This test is used to clarify the description of the predictions of the logistic regression model with observational data. The classification table shows the accuracy of the predictions of the regression model to predict the possibility of a company obtaining a non-investment grade or investment grade bond rating. The test results tested using SPSS can be seen in the following table:

Table 3

Classification Table<sup>a</sup>

Step 1	Bond Rating	Observed	predicted		
			Bond Rating		Percent age Correct
			Non investment Grade	Investments Grade	
	Non Investment Grade	0	8	.0	
	Investment Grade	1	211	99.5	
Overall Percentage				95.9	

Source: Results of Data Processing (2023)

Based on the results of the classification matrix test in table 3, it shows that of the 8 companies in the non-investment grade category that correctly received the non-investment grade rating category, there were no observations, while the 8 observations were included in the investment grade category with a value for the non-investment grade observation truth level of 0%. Meanwhile, of the 212 observations in the investment grade category, 211 were correct in the investment grade category, while 1 other company was included in the non-

investment grade category with a classification correctness level for observations experiencing investment grade of 99.5%. The overall prediction accuracy of this model is 95.9%.

The Nagelkerke R Square test. This test is used to determine how much the independent variables are able to explain the dependent variable. The Nagelkerke R Square value is the value that indicates the variability of the dependent variable that can be explained by the independent variables studied, while the remainder, namely 100% minus the Nagelkerke R Square value, is the amount of variability of the dependent variable that is explained by other variables outside the study. The Nagelkerke R Square value can be seen in the following table:

Table 4  
Summary models

step	-2 log likelihoods	Cox & Snell R Square	Nagelkerke R Square
1	44.181a	.106	.394

Source: Results of Data Processing (2023)

Based on the results of the Nagelkerke R Square value in table 4 it shows that the Nagelkerke R Square value is 0.394, where the variability of the dependent variable that can be explained by the independent variable is 39.4%, the remaining 60.6% is explained by other variables outside the research model or in other words X1 (Profitability), X2 (Leverage), X3 (Liquidity), and X4 (Bond Age) can explain the bond rating variable of 39.4%.

Logistic Regression Analysis This analysis is to determine whether there is an effect of profitability, leverage, liquidity and bond age on bond ratings, it is necessary to test the hypothesis using the SPSS program. The dependent variable in this study is bond rating, while the independent variables are profitability, leverage, liquidity and bond age.

Table 5  
Variables in the Equation

	B	SE	Wald	Df	Sig.	Exp(B)	95% EXP(B)	
							Lower	Upper
						139992 870867 370800 000000 .000	144232 6,330	1.359E +40
Step 1a								
DER	1,252	.592	4,475	1	.034	3,499	1,096	11.166
CR	.060	.564	012	1	.915	1,062	.352	3,207
Bondage i	.300	.247	1,474	1	.225	1,350	.832	2,191
Constant	-2,457	1958	1,574	1	.210	086		

Source: Results of Data Processing (2023)

Based on the results of the analysis using logistic regression, the regression equation is obtained as follows:

$$Y = -2.457 + 53.296X1 + 1.252X2 + 0.060X3 + 0.300X4 + e$$

$\alpha$	: Constant
$\beta_{1-5}$	: Regression coefficient
X1	: Profitability
X2	: leverage
X3	: Liquidity
X4	: The age of the bonds
e	: Standard error

The results of this equation, the logistic regression dummy variable has 2 alternatives 1 and 0 related to variable Y. The profitability coefficient value is 53.296, meaning that if profitability is increased by 1% then the bond rating is close to 1 meaning it is very influential because the profitability results are very high compared to other variables. The leverage coefficient value is 1.252, meaning that if leverage is increased by 1%, the bond rating is close to 1, meaning that leverage also affects the Y variable. The liquidity coefficient value is 0.060, meaning that if liquidity is increased by 1%, the bond rating is close to 0, meaning that liquidity has no effect on bond ratings. Bond age coefficient value of 0.300,

Research Hypothesis Test Results. Partially. Hypothesis Test 1. Variable X1 (Profitability) shows a significant value of 0.008. The significant level used is 0.05, meaning the value of  $0.008 < 0.05$  identifies that H1 is accepted. The higher this ratio, the better it means that companies that earn high profits are very influential on bond ratings. The results of the study proved that profitability has a large effect on bond ratings. The results of this study are consistent with research conducted by Septyawanti (2013); (Faradi & Supriyanto, 2015); (Pramesti, 2022) and (Aluman et al., 2022) which states that profitability affects the rating of bonds.

Hypothesis Test 2. Variable X2 (Leverage) shows a significant value of 0.034. The significant level used is 0.05, meaning the value is  $0.034 < 0.05$ , indicating that H2 is accepted. The high value of the leverage ratio means that the smaller the assets funded by debt, the smaller the risk of company failure. The research results prove that leverage has an effect on bond ratings. The results of this study are consistent with the research conducted by Septyawanti (2013) and (Suharli, 2008) which states that leverage has an effect on bond ratings, but contradicts this (Pramesti, 2022) and (Faradi & Supriyanto, 2015). It can be proven that leverage indicates a rating conducted by PEFINDO using financial performance analysis, namely debt level analysis.

Hypothesis Test 3 Variable X3 (Liquidity) shows a significant value of 0.915. The significant level used is 0.05, meaning the value is  $0.915 > 0.05$ , this indicates that H3 is rejected. Low liquidity indicates a company's risk, causing an inability to meet debt obligations. The research results prove that liquidity has no effect on bond ratings. The results of this study contradict previous research conducted by (Hung et al., 2021) and (Faradi & Supriyanto, 2015) which states that the current ratio has a significant influence on bond ratings. Differences in research results can be caused by differences in samples used with different observation periods and financial reports used. But the results of this study are in accordance with the results of research conducted by (Septyawanti, 2013) and Yessy Arifman (2014) concluded that liquidity as measured by CR has no effect on bond ratings, as well (Aluman et al., 2022) which showed a significant negative result. It can be concluded that if the company has greater liabilities than the company's current assets, in other words, the resulting low liquidity ratio is not related to the company's bond rating.

Hypothesis Test 4. Variable X4 (Age of Bonds) shows a significant value of 0.225. The significant level used is 0.05, meaning that the value is  $0.225 > 0.05$ , which indicates that H4 is rejected. Theoretically, the longer the bond maturity, the greater the level of uncertainty, so the greater the maturity risk. However, the results of this study prove that bond age has no effect on bond ratings. Pefindo's rating results do not consider the age of the bonds as a variable that significantly affects the bond ratings. The results of this study are consistent with the research conducted by (Suwarmelina, 2021) who concluded that bond age does not have a strong influence on bond ratings so that it is permissible to ignore bond age in investing in bonds, but contradicts (Almilia & Devi, 2007). It can be concluded that bond age is not a benchmark for PEFINDO in assigning ratings.

Simultaneous testing with hypothesis testing 5. This test is to answer problems and hypotheses regarding the influence of independent variables simultaneously or together, by looking at the significance value that exists in the SPSS output results, namely in the Omnibus Test of Model Coefficients table in the significance column compared to the level alpha 0.05. The results can be seen in table 6 below:



Table 6

Omnibus Tests of Model Coefficients				
		Chi-square	Df	Sig.
Step 1	step	24,552	4	.000
	blocks	24,552	4	.000
	Model	24,552	4	.000

Source: Results of Data Processing (2023)

The results of the Omnibus Test of Model Coefficients in the table above show that the Chi-square value is 24.552 with a degree of freedom = 4 and a significance level of 0.000. The significance value is much smaller than 0.05, so  $H_0$  is accepted, which means that the independent variables (Profitability, Leverage, Liquidity and Bond Age) together have a significant effect on bond ratings. The results of this study are consistent with research Hasan & Dana (2018), (Faradi & Supriyanto, 2015), and (Aluman et al., 2022) states that simultaneously affect the rating of bonds.

## Conclusion

Based on the results of data analysis and hypothesis testing and discussion, some conclusions can be drawn as follows: Partially, Return On Assets or the company's profitability level and the Debt to Equity Ratio or the company's leverage level affect the bond ratings of public companies listed on the IDX in 2017- 2018. Partially, the Current Ratio or the company's liquidity level and bond age have no effect on the bond ratings of public companies listed on the IDX in 2017-2018. Simultaneously, these four variables jointly affect corporate bond ratings and play a role in increasing corporate bond ratings.

As a suggestion, future researchers may consider using all bonds as research objects including financial institutions in the Indonesia Bond Market Directory (IBMD) in order to obtain more valid results. Should consider other variables in accordance with the bond rating assessment mechanism conducted by PEFINDO. The next research period, it is better to use research over 4 or 5 years in order to be able to adjust the age of the bonds at maturity so that it is possible to see the company's ability to pay off its bond debt and minimize the risk of default. Future researchers should use annual reports for more consistency in sample calculations.

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### Introduction

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Return on Equity as a proxy for profitability is a ratio for measuring net profit after tax with own capital (Kasmir, 2016). This ratio shows the efficient use of own capital. The higher this ratio, the better. This means that the position of the owner of the company is getting stronger, and vice versa. Then the bond issuer is considered to have a good rating because the profit earned can be used to pay off its debts. According to the results of research conducted by Faradi & Supriyanto (2015) and Pramesti (2022) concluded that the variable profitability has an effect on bond ratings. As well (Aluman et al., 2022). From the above definition it can be concluded that Return On Equity (ROE) is a financial ratio to measure a company's ability to earn profits (return) by comparison between profit after tax and own capital.

H1 = It is suspected that profitability has an effect on bond ratings

According to Harahap (Harahap, 2018) Leverage ratio is a ratio that measures how far a company is financed by liabilities or external parties with the company's ability as described by equity. According to (Faradi & Supriyanto, 2015) This ratio is used to measure the extent to which a company uses debt to finance its investment. The higher or lower the value of the leverage ratio means that only a small portion of assets are funded with debt and the smaller the risk of company failure, and vice versa the lower the company's leverage, the higher the rating of a company. Companies with low levels of leverage tend to be favored by investors because investors have confidence that the company will be able to pay off all of its obligations when the debt is due. (Septyawanti, 2013). According to the results of research conducted by Suharli (2008) concluded that the leverage ratio has a significant effect on bond ratings. Although on the other hand (Pramesti, 2022) shows that leverage has no effect on bond ratings, as well as on (Faradi & Supriyanto, 2015) which shows that there is no effect of capital structure on bond ratings. The difference in research results raises special interest for researchers to look further at the relationship between leverage and bond ratings, with the following hypothesis: H2 = It is suspected that leverage has an effect on bond ratings

Liquidity is the company's ability to meet short-term financial obligations on time (Sutrisno, 2013). Results of research by Hung et al., (2021) concluded that liquidity can have a significant positive effect on bond ratings, as well as (Faradi & Supriyanto, 2015) which shows the results of liquidity have a significant effect on bond ratings, although on the other hand (Aluman et al., 2022) shows a negative and significant effect. According to the significance of the results of the study by Hung et al., (2021), because manufacturing companies that have high liquidity mean that their current assets are greater than their current liabilities, so that if at any time there is a change in economic or financial conditions, these current assets can be used to fulfill the company's obligations related to bonds at maturity. So that liquidity is expected to be able to affect a company's bond rating if the level of liquidity is high because by paying off its short term, the company is also expected to be able to pay off its long term obligations (bonds payable).

H3 = It is suspected that liquidity has an effect on bond ratings

The maturity of the bond (maturity) is the date on which the bondholder will receive payment of the principal or nominal value of the bond held (Brigham & Ehrhardt, 2017). Bond maturity periods vary from 365 days to over 5 years. According to Almilia & Devi (2007) the short life of the bond actually indicates an investment grade bond rating. In general, the longer the maturity of a bond, the greater the level of uncertainty so that the greater the maturity risk and conversely, the shorter the maturity of the bond, the better the rating of the bond.

H4 = It is suspected that the age of the bonds has an effect on the rating of the bonds

One of the bond rating agencies is PT. PEFINDO (Indonesian Securities Rating Agency). PT. PEFINDO was established in Jakarta on December 21, 1993 on the initiative of BAPEPAM and Bank Indonesia. The main function of PT. PEFINDO is to provide an objective, independent and trustworthy rating of credit risk (credit risk) of debt securities (debt securities) publicly. PEFINDO has an affiliation with an international rating agency, namely S&P (Standard & Poor) and is active in ASEAN Forum of Credit Rating Agencies (AFCRA) activities to improve the quality rating network.

## Research methods

The population in this study are all companies that issue bonds and are listed on the Indonesia Stock Exchange in 2017-2018. This study used a purposive sampling technique for determining the sample, which is a form of non-random or non-probabilistic sampling method in which the sampling method is carried out by selecting subjects based on specific criteria set by the researcher. The population used as the sample is the population that meets the following criteria used in sampling: 1) All public company bonds outstanding for 2 years in the period 2017-2018 and are listed on the Indonesia Stock Exchange. 2) All bonds are bonds issued by publicly listed companies that publish annual financial reports for the 2017-2018 period. 3) All corporate bonds are rated by PT. PEFINDO. 4) Using the rupiah currency in the presentation of financial statements. Based on data on the Indonesia Stock Exchange, the total population is 76 public companies on the IDX in 2017-2018. The number of samples that meet the requirements is that there are 34 public companies that fit these criteria.

The analysis technique in this study was tested using a logistic regression model because the dependent variable is a dummy variable. The logistic regression model can be estimated, using the following methods: a) Regression Model Feasibility Method, Hypotheses to assess model fit:  $H_0$  = The hypothesized model is fit with the data, and  $H_a$  = The hypothesized model is not fit with the data With the following decision: Value of goodness of The fit test as measured by the chi-square value on the Hosmer and Lemeshow test is: If the probability is  $> 0.05$  then  $H_0$  is accepted and  $H_a$  is rejected, and if the probability is  $< 0.05$  then  $H_0$  is rejected and  $H_a$  is accepted. b) Statistical Value  $-2\text{LogL}$ . Assess the  $-2\text{LogL}$  number at the beginning (block number = 0) and  $-2\text{LogL}$  number in block number = 1, if there is a decrease in  $-2\text{LogL}$  number then it shows a good regression model. The log likelihood in logistic regression is similar to the meaning of "sum of squared error" in the regression model, so a decrease in the log likelihood indicates a good regression model. c) Value of Nagelkerke's R Square. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression.

## Results and Discussion

The Hosmer and Lemeshow test. To find out the difference between predictions and observations, the Hosmer and Lemeshow test and the Chi Square approach were used. According to (Ghozali, 2013), if the Hosmer and Lemeshow values are equal to or less than 0.05, then the null hypothesis is rejected, which means that there is a significant difference between the model and the observed values so that the Goodness Fit Model is not good because it cannot predict the observed values. The results of the Hosmer and Lemeshow Test can be seen in the following table:

Table 1

Hosmer and Lemeshow Test			
step	Chi-square	Df	Sig.
1	.838	8	.999

Source: Results of Data Processing (2023)

Based on table 1, the results of testing the similarity of the predictions of the logistic regression model with observational data show that the Chi-square value is 0.838, with a significant value of 0.999. The

significant value is greater than 0.05 ( $> 0.05$ ), so there is no difference between the predictions of the logistic regression model and the observed data. This means that the logistic regression model can be accepted because the model is in accordance with the observations.

Table 2

Iteration History <sup>a,b,c,d</sup>							
		-2 log likelihoods	Coefficients				
			Constant	ROA	DER	CR	Age Bond
Iterations	step						
	1	90,682	1,550	1943	071	-.062	.011
	2	63,378	1,714	6,215	.214	-.111	.033
	3	52,152	.660	18038	.508	-.062	.074
	4	46,062	-.984	37,681	.836	.017	.163
	5	44,409	-1,959	49,599	1050	.046	.257
	6	44,192	-2,357	53,053	1,194	.056	.294
	7	44,181	-2,449	53,294	1,247	.060	.300
	8	44,181	-2,457	53,296	1,252	.060	.300
	9	44,181	-2,457	53,296	1,252	.060	.300

Source: Results of Data Processing (2023)

Classification Matrix Test. This test is used to clarify the description of the predictions of the logistic regression model with observational data. The classification table shows the accuracy of the predictions of the regression model to predict the possibility of a company obtaining a non-investment grade or investment grade bond rating. The test results tested using SPSS can be seen in the following table:

Table 3

Classification Table <sup>a</sup>					
		Observed	predicted		
			Bond Rating		Percent age Correct
			Non investment Grade	Investments Grade	
Step 1	Bond Rating	Non Investment Grade	0	8	.0
		Investment Grade	1	211	99.5
Overall Percentage					95.9

Source: Results of Data Processing (2023)

Based on the results of the classification matrix test in table 3, it shows that of the 8 companies in the non-investment grade category that correctly received the non-investment grade rating category, there were no observations, while the 8 observations were included in the investment grade category with a value for the non-investment grade observation truth level of 0%. Meanwhile, of the 212 observations in the investment grade category, 211 were correct in the investment grade category, while 1 other company was included in the non-

investment grade category with a classification correctness level for observations experiencing investment grade of 99.5%. The overall prediction accuracy of this model is 95.9%.

The Nagelkerke R Square test. This test is used to determine how much the independent variables are able to explain the dependent variable. The Nagelkerke R Square value is the value that indicates the variability of the dependent variable that can be explained by the independent variables studied, while the remainder, namely 100% minus the Nagelkerke R Square value, is the amount of variability of the dependent variable that is explained by other variables outside the study. The Nagelkerke R Square value can be seen in the following table:

Table 4  
Summary models

step	-2 log likelihoods	Cox & Snell R Square	Nagelkerke R Square
1	44.181a	.106	.394

Source: Results of Data Processing (2023)

Based on the results of the Nagelkerke R Square value in table 4 it shows that the Nagelkerke R Square value is 0.394, where the variability of the dependent variable that can be explained by the independent variable is 39.4%, the remaining 60.6% is explained by other variables outside the research model or in other words X1 (Profitability), X2 (Leverage), X3 (Liquidity), and X4 (Bond Age) can explain the bond rating variable of 39.4%.

Logistic Regression Analysis This analysis is to determine whether there is an effect of profitability, leverage, liquidity and bond age on bond ratings, it is necessary to test the hypothesis using the SPSS program. The dependent variable in this study is bond rating, while the independent variables are profitability, leverage, liquidity and bond age.

Table 5  
Variables in the Equation

	B	SE	Wald	Df	Sig.	Exp(B)	95% EXP(B)	
							Lower	Upper
						139992 870867 370800 000000 .000	144232 6,330	1.359E +40
Step 1a								
DER	1,252	.592	4,475	1	.034	3,499	1,096	11.166
CR	.060	.564	012	1	.915	1,062	.352	3,207
Bondage i	.300	.247	1,474	1	.225	1,350	.832	2,191
Constant	-2,457	1958	1,574	1	.210	086		

Source: Results of Data Processing (2023)

Based on the results of the analysis using logistic regression, the regression equation is obtained as follows:

$$Y = -2.457 + 53.296X_1 + 1.252X_2 + 0.060X_3 + 0.300X_4 + e$$

$\alpha$	: Constant
$\beta_{1-5}$	: Regression coefficient
X1	: Profitability
X2	: leverage
X3	: Liquidity
X4	: The age of the bonds
e	: Standard error

The results of this equation, the logistic regression dummy variable has 2 alternatives 1 and 0 related to variable Y. The profitability coefficient value is 53.296, meaning that if profitability is increased by 1% then the bond rating is close to 1 meaning it is very influential because the profitability results are very high compared to other variables. The leverage coefficient value is 1.252, meaning that if leverage is increased by 1%, the bond rating is close to 1, meaning that leverage also affects the Y variable. The liquidity coefficient value is 0.060, meaning that if liquidity is increased by 1%, the bond rating is close to 0, meaning that liquidity has no effect on bond ratings. Bond age coefficient value of 0.300,

Research Hypothesis Test Results. Partially. Hypothesis Test 1. Variable X1 (Profitability) shows a significant value of 0.008. The significant level used is 0.05, meaning the value of 0.008 < 0.05 identifies that H1 is accepted. The higher this ratio, the better it means that companies that earn high profits are very influential on bond ratings. The results of the study proved that profitability has a large effect on bond ratings. The results of this study are consistent with research conducted by Septyawanti (2013); (Faradi & Supriyanto, 2015); (Pramesti, 2022) and (Aluman et al., 2022) which states that profitability affects the rating of bonds.

Hypothesis Test 2. Variable X2 (Leverage) shows a significant value of 0.034. The significant level used is 0.05, meaning the value is 0.034 < 0.05, indicating that H2 is accepted. The high value of the leverage ratio means that the smaller the assets funded by debt, the smaller the risk of company failure. The research results prove that leverage has an effect on bond ratings. The results of this study are consistent with the research conducted by Septyawanti (2013) and (Suharli, 2008) which states that leverage has an effect on bond ratings, but contradicts this (Pramesti, 2022) and (Faradi & Supriyanto, 2015). It can be proven that leverage indicates a rating conducted by PEFINDO using financial performance analysis, namely debt level analysis.

Hypothesis Test 3 Variable X3 (Liquidity) shows a significant value of 0.915. The significant level used is 0.05, meaning the value is 0.915 > 0.05, this indicates that H3 is rejected. Low liquidity indicates a company's risk, causing an inability to meet debt obligations. The research results prove that liquidity has no effect on bond ratings. The results of this study contradict previous research conducted by (Hung et al., 2021) and (Faradi & Supriyanto, 2015) which states that the current ratio has a significant influence on bond ratings. Differences in research results can be caused by differences in samples used with different observation periods and financial reports used. But the results of this study are in accordance with the results of research conducted by (Septyawanti, 2013) and Yessy Arifman (2014) concluded that liquidity as measured by CR has no effect on bond ratings, as well (Aluman et al., 2022) which showed a significant negative result. It can be concluded that if the company has greater liabilities than the company's current assets, in other words, the resulting low liquidity ratio is not related to the company's bond rating.

Hypothesis Test 4. Variable X4 (Age of Bonds) shows a significant value of 0.225. The significant level used is 0.05, meaning that the value is 0.225 > 0.05, which indicates that H4 is rejected. Theoretically, the longer the bond maturity, the greater the level of uncertainty, so the greater the maturity risk. However, the results of this study prove that bond age has no effect on bond ratings. Pefindo's rating results do not consider the age of the bonds as a variable that significantly affects the bond ratings. The results of this study are consistent with the research conducted by (Suwarmelina, 2021) who concluded that bond age does not have a strong influence on bond ratings so that it is permissible to ignore bond age in investing in bonds, but contradicts (Almilia & Devi, 2007). It can be concluded that bond age is not a benchmark for PEFINDO in assigning ratings.

Simultaneous testing with hypothesis testing 5. This test is to answer problems and hypotheses regarding the influence of independent variables simultaneously or together, by looking at the significance value that exists in the SPSS output results, namely in the Omnibus Test of Model Coefficients table in the significance column compared to the level alpha 0.05. The results can be seen in table 6 below:



Table 6

Omnibus Tests of Model Coefficients				
		Chi-square	Df	Sig.
Step 1	step	24,552	4	.000
	blocks	24,552	4	.000
	Model	24,552	4	.000

Source: Results of Data Processing (2023)

The results of the Omnibus Test of Model Coefficients in the table above show that the Chi-square value is 24.552 with a degree of freedom = 4 and a significance level of 0.000. The significance value is much smaller than 0.05, so  $H_0$  is accepted, which means that the independent variables (Profitability, Leverage, Liquidity and Bond Age) together have a significant effect on bond ratings. The results of this study are consistent with research Hasan & Dana (2018), (Faradi & Supriyanto, 2015), and (Aluman et al., 2022) states that simultaneously affect the rating of bonds.

## Conclusion

Based on the results of data analysis and hypothesis testing and discussion, some conclusions can be drawn as follows: Partially, Return On Assets or the company's profitability level and the Debt to Equity Ratio or the company's leverage level affect the bond ratings of public companies listed on the IDX in 2017- 2018. Partially, the Current Ratio or the company's liquidity level and bond age have no effect on the bond ratings of public companies listed on the IDX in 2017-2018. Simultaneously, these four variables jointly affect corporate bond ratings and play a role in increasing corporate bond ratings.

As a suggestion, future researchers may consider using all bonds as research objects including financial institutions in the Indonesia Bond Market Directory (IBMD) in order to obtain more valid results. Should consider other variables in accordance with the bond rating assessment mechanism conducted by PEFINDO. The next research period, it is better to use research over 4 or 5 years in order to be able to adjust the age of the bonds at maturity so that it is possible to see the company's ability to pay off its bond debt and minimize the risk of default. Future researchers should use annual reports for more consistency in sample calculations.

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## Profitability, Leverage, Liquidity and Bond Age On Bond Rating

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Liquidity  
Profitability

### ABSTRACT(10pt, Times New Roman, English)

*The rating of a bond becomes a guideline in purchasing bonds. The purpose of this study was to determine the effect of Profitability, Leverage, Liquidity, and Bond Age on Bond Ratings in Public Companies Listed on the IDX for the 2017-2018 period. The sample consisted of 34 companies using purposive sampling technique and analyzed using logistic regression data analysis. The results of this study indicate that simultaneously Profitability, Leverage, Liquidity and Bond Age have a significant effect on Bond Ratings while Profitability and Leverage partially have a significant effect on Bond Ratings, but Liquidity and Bond Age partially have no significant effect on Bond Ratings. The use of Logistics analysis is a novelty of this research because variable Y has a limited value/ordinal scale. Liquidity and bond age which are generally used as the basis for making decisions to buy bonds,*

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## Introduction

The capital market is a transaction market for various long-term financial instruments that can be traded, including debentures, stocks, mutual funds, derivative instruments and even other instruments. The capital market is a means of funding for companies and other institutions (eg government, private sector) and as a means of investment activity. In the capital market, the long-term instruments traded are bonds, stocks, warrants, rights, mutual funds and many other derivative instruments such as futures and options.

Investment is an activity to place funds in one or more than one asset for a certain period with the hope of obtaining profit or income or increasing the value of the initial investment (capital) which aims to maximize return in the future (Tandelilin, 2017). A bond is a long-term debt instrument or also known as a long-term contract in which the borrower agrees to pay interest and principal, on a certain date, to the holder of the bond.(Brigham & Houston, 2018).

Bonds are one of the most attractive financial instruments for investors in the capital market or for companies to obtain funds for the benefit of the company (Rahardjo, 2003). Bonds are rated by a bond rating agency which provides risk scale rating information as an indication of the extent of security of a bond for investors. The benefits of issuing bonds that are obtained from companies are information on business position, determining the structure of bonds, supporting company performance, as a marketing tool, and maintaining investor confidence

SNP Finance's rating dropped drastically from idA to idCCC with its six MTN series and received a credit watch outlook with negative implications due to its MTN default case. This prompted researchers to

conduct research related to bond rating by using financial factors, namely profitability, leverage, and liquidity as well as non-financial factors, namely the age of the bonds.

Return on Equity as a proxy for profitability is a ratio for measuring net profit after tax with own capital (Kasmir, 2016). This ratio shows the efficient use of own capital. The higher this ratio, the better. This means that the position of the owner of the company is getting stronger, and vice versa. Then the bond issuer is considered to have a good rating because the profit earned can be used to pay off its debts. According to the results of research conducted by Faradi & Supriyanto (2015) and Pramesti, (2022) concluded that the variable profitability has an effect on bond ratings. As well (Aluman et al., 2022). From the above definition it can be concluded that Return On Equity (ROE) is a financial ratio to measure a company's ability to earn profits (return) by comparison between profit after tax and own capital.

H1 = It is suspected that profitability has an effect on bond ratings

According to Harahap (Harahap, 2018) Leverage ratio is a ratio that measures how far a company is financed by liabilities or external parties with the company's ability as described by equity. According to (Faradi & Supriyanto, 2015) This ratio is used to measure the extent to which a company uses debt to finance its investment. The higher or lower the value of the leverage ratio means that only a small portion of assets are funded with debt and the smaller the risk of company failure, and vice versa the lower the company's leverage, the higher the rating of a company. Companies with low levels of leverage tend to be favored by investors because investors have confidence that the company will be able to pay off all of its obligations when the debt is due. (Septyawanti, 2013). According to the results of research conducted by Suharli (2008) concluded that the leverage ratio has a significant effect on bond ratings. Although on the other hand (Pramesti, 2022) shows that leverage has no effect on bond ratings, as well as on (Faradi & Supriyanto, 2015) which shows that there is no effect of capital structure on bond ratings. The difference in research results raises special interest for researchers to look further at the relationship between leverage and bond ratings, with the following hypothesis: H2 = It is suspected that leverage has an effect on bond ratings

Liquidity is the company's ability to meet short-term financial obligations on time (Sutrisno, 2013). Results of research by Hung et al., (2021) concluded that liquidity can have a significant positive effect on bond ratings, as well as (Faradi & Supriyanto, 2015) which shows the results of liquidity have a significant effect on bond ratings, although on the other hand (Aluman et al., 2022) shows a negative and significant effect. According to the significance of the results of the study by Hung et al., (2021), because manufacturing companies that have high liquidity mean that their current assets are greater than their current liabilities, so that if at any time there is a change in economic or financial conditions, these current assets can be used to fulfill the company's obligations related to bonds at maturity. So that liquidity is expected to be able to affect a company's bond rating if the level of liquidity is high because by paying off its short term, the company is also expected to be able to pay off its long term obligations (bonds payable).

H3 = It is suspected that liquidity has an effect on bond ratings

The maturity of the bond (maturity) is the date on which the bondholder will receive payment of the principal or nominal value of the bond held (Brigham & Ehrhardt, 2017). Bond maturity periods vary from 365 days to over 5 years. According to Almilia & Devi (2007) the short life of the bond actually indicates an investment grade bond rating. In general, the longer the maturity of a bond, the greater the level of uncertainty so that the greater the maturity risk and conversely, the shorter the maturity of the bond, the better the rating of the bond.

H4 = It is suspected that the age of the bonds has an effect on the rating of the bonds

One of the bond rating agencies is PT. PEFINDO (Indonesian Securities Rating Agency). PT. PEFINDO was established in Jakarta on December 21, 1993 on the initiative of BAPEPAM and Bank Indonesia. The main function of PT. PEFINDO is to provide an objective, independent and trustworthy rating of credit risk (credit risk) of debt securities (debt securities) publicly. PEFINDO has an affiliation with an international rating agency, namely S&P (Standard & Poor) and is active in ASEAN Forum of Credit Rating Agencies (AFCRA) activities to improve the quality rating network.

## Research methods

The population in this study are all companies that issue bonds and are listed on the Indonesia Stock Exchange in 2017-2018. This study used a purposive sampling technique for determining the sample, which is a form of non-random or non-probabilistic sampling method in which the sampling method is carried out by selecting subjects based on specific criteria set by the researcher (Sugiyono, 2021). The population used as the sample is the population that meets the following criteria used in sampling: 1) All public company bonds outstanding for 2 years in the period 2017-2018 and are listed on the Indonesia Stock Exchange. 2) All bonds are bonds issued by publicly listed companies that publish annual financial reports for the 2017-2018 period. 3) All corporate bonds are rated by PT. PEFINDO. 4) Using the rupiah currency in the presentation of financial statements. Based on data on the Indonesia Stock Exchange, the total population is 76 public companies on the IDX in 2017-2018. The number of samples that meet the requirements is that there are 34 public companies that fit these criteria.

The analysis technique in this study was tested using a logistic regression model because the dependent variable is a dummy variable. The logistic regression model can be estimated, using the following methods: a) Regression Model Feasibility Method, Hypotheses to assess model fit:  $H_0$  = The hypothesized model is fit with the data, and  $H_a$  = The hypothesized model is not fit with the data With the following decision: Value of goodness of The fit test as measured by the chi-square value on the Hosmer and Lemeshow test is: If the probability is  $> 0.05$  then  $H_0$  is accepted and  $H_a$  is rejected, and if the probability is  $< 0.05$  then  $H_0$  is rejected and  $H_a$  is accepted. b) Statistical Value  $-2\text{LogL}$ . Assess the  $-2\text{LogL}$  number at the beginning (block number = 0) and  $-2\text{LogL}$  number in block number = 1, if there is a decrease in  $-2\text{LogL}$  number then it shows a good regression model. The log likelihood in logistic regression is similar to the meaning of "sum of squared error" in the regression model, so a decrease in the log likelihood indicates a good regression model. c) Value of Nagelkerke's R Square. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Nagelkerke's R Square is a modification of the Cox & Snell's R Square coefficient to ensure that its value varies from 0 to 1. This is done by dividing the Cox & Snell's R Square value by the maximum value. The Nagel Karke  $R^2$  value can be interpreted like the  $R^2$  value in multiple regression. Hypothesis testing was carried out using a logistic regression model at a significance level ( $\alpha$ ) of 5%, with the following model:

$$\ln Y = \rho/1 - \rho = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Informations:

$\ln Y = \rho/1 - \rho$  = Bond Ratings

$\ln Y = \rho/1 - \rho = 1$ , if Bond Ratings are *investment-grade*

$\ln Y = \rho/1 - \rho = 0$ , if Bond Ratings are *non investment-grade*

$\alpha$  : Konstanta

$\beta_1-5$  : Regression Coefficient

$X_1$  : Profitability

$X_2$  : Leverage

$X_3$  : Likuidity

$X_4$  : Bond age

$e$  : Standard error

## Results and Discussion

Descriptive analysis in this research was carried out to look descriptively at the research variables. Companies that are the object of research are public companies listed on the Indonesia Stock Exchange in 2017-2018 and published financial reports during the year of observation, namely 2017-2018.

Profitability in this study using Return On Assets (ROA) to measure the ability or inability (default) of a company to operate activity, to produce good rating or not. This ratio is obtained by dividing net profit by the total assets of a company. The company that has the highest ROA is Global Mediacom, Tbk. It was 0.391 in 2017, and became 0.404 in 2018. Meanwhile, the lowest ROA was owned by three banking companies,

namely Bank Maybank Indonesia, Tbk., Regional Development Bank West Java and Banten, Tbk., Bank CIMB Niaga, Tbk. Is 0.011 for each company in 2017 and 0.013 for each company in 2013 (www.idx.co.id, 2022).

This study uses the ratio of debt to equity ratio (DER) which is obtained by dividing the company's total debt by equity as proxy of Leverage. This ratio is used to measure the risk of a company's failure to pay debts. The highest DER value in 2017 was owned by Bank Capital Indonesia, Tbk. It was 10,609 and increased to 11,135 in 2018. Meanwhile, the lowest DER value was owned by Nippon Indosari Corpindo, Tbk. It was 0.616 in 2017, and became 0.506 in 2018 (www.idx.co.id, 2022).

Liquidity. In this research, the current ratio is used to measure the company's overall ability to pay its current liabilities using all current assets. This current ratio is obtained by dividing current assets by current liabilities of a company. The highest score is owned by Tiphone Mobile Indonesia, Tbk. It was 3,884 in 2017, became 5,189 in 2018. Meanwhile, the lowest CR value was owned by Asa Marga (Persero), Tbk, which was 0.760 in 2017, and was 0.380 in 2018 (www.idx.co.id, 2022).

The Hosmer and Lemeshow test. To find out the difference between predictions and observations, the Hosmer and Lemeshow test and the Chi Square approach were used. According to(Ghozali, 2013), if the Hosmer and Lemeshow values are equal to or less than 0.05, then the null hypothesis is rejected, which means that there is a significant difference between the model and the observed values so that the Goodness Fit Model is not good because it cannot predict the observed values. The results of the Hosmer and Lemeshow Test can be seen in the following table:

Table 1

Hosmer and Lemeshow Test			
step	Chi-square	Df	Sig.
1	.838	8	.999

Source: Results of Data Processing (2023)

Based on table 1, the results of testing the similarity of the predictions of the logistic regression model with observational data show that the Chi-square value is 0.838, with a significant value of 0.999. The significant value is greater than 0.05 (> 0.05), so there is no difference between the predictions of the logistic regression model and the observed data. This means that the logistic regression model can be accepted because the model is in accordance with the observations.

Table 2

Iteration History <sub>a,b,c,d</sub>							
		-2 log likelihoods	Coefficients				
Iterations			Constant	ROA	DER	CR	Age Bond
step	1	90,682	1,550	1943	071	-.062	011
	2	63,378	1,714	6,215	.214	-.111	.033
	3	52,152	.660	18038	.508	-.062	.074
	4	46,062	-.984	37,681	.836	.017	.163
	5	44,409	-1,959	49,599	1050	046	.257
	6	44,192	-2,357	53,053	1,194	056	.294
	7	44,181	-2,449	53,294	1,247	.060	.300
	8	44,181	-2,457	53,296	1,252	.060	.300

9	44,181	-2,457	53,296	1,252	.060	.300
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Source: Results of Data Processing (2023)

Classification Matrix Test. This test is used to clarify the description of the predictions of the logistic regression model with observational data. The classification table shows the accuracy of the predictions of the regression model to predict the possibility of a company obtaining a non-investment grade or investment grade bond rating. The test results tested using SPSS can be seen in the following table:

Table 3

		Classification Tablea			
		Observed	predicted		
			Bond Rating		Percent age Correct
Step 1	Bond Rating	Non Investment Grade	Investments Grade		
		Non Investment Grade	0	8	.0
		Investment Grade	1	211	99.5
		Overall Percentage			95.9

Source: Results of Data Processing (2023)

Based on the results of the classification matrix test in table 3, it shows that of the 8 companies in the non-investment grade category that correctly received the non-investment grade rating category, there were no observations, while the 8 observations were included in the investment grade category with a value for the non-investment grade observation truth level of 0%. Meanwhile, of the 212 observations in the investment grade category, 211 were correct in the investment grade category, while 1 other company was included in the non-investment grade category with a classification correctness level for observations experiencing investment grade of 99.5%. The overall prediction accuracy of this model is 95.9%.

The Nagelkerke R Square test. This test is used to determine how much the independent variables are able to explain the dependent variable. The Nagelkerke R Square value is the value that indicates the variability of the dependent variable that can be explained by the independent variables studied, while the remainder, namely 100% minus the Nagelkerke R Square value, is the amount of variability of the dependent variable that is explained by other variables outside the study. The Nagelkerke R Square value can be seen in the following table:

Table 4

Summary models			
step	-2 log likelihoods	Cox & Snell R Square	Nagelkerke R Square
1	44.181a	.106	.394

Source: Results of Data Processing (2023)

Based on the results of the Nagelkerke R Square value in table 4 it shows that the Nagelkerke R Square value is 0.394, where the variability of the dependent variable that can be explained by the independent variable is 39.4%, the remaining 60.6% is explained by other variables outside the research model or in other words X1 (Profitability), X2 (Leverage), X3 (Liquidity), and X4 (Bond Age) can explain the bond rating variable of 39.4%.

Logistic Regression Analysis This analysis is to determine whether there is an effect of profitability, leverage, liquidity and bond age on bond ratings, it is necessary to test the hypothesis using the SPSS program. The dependent variable in this study is bond rating, while the independent variables are profitability, leverage, liquidity and bond age.

Table 5  
Variables in the Equation

		B	SE	Wald	Df	Sig.	Exp(B)	95% EXP(B) Lower	Upper
Step 1a	ROA	53,296	19,957	7.132	1	.008	139992 870867 370800 000000 .000	144232 6,330	1.359E +40
	DER	1,252	.592	4,475	1	.034	3,499	1,096	11.166
	CR	.060	.564	.012	1	.915	1,062	.352	3,207
	Bondage i	.300	.247	1,474	1	.225	1,350	.832	2,191
	Constant	-2,457	1958	1,574	1	.210	.086		

Source: Results of Data Processing (2023)

Based on the results of the analysis using logistic regression, the regression equation is obtained as follows:

$$\ln Y = -2.457 + 53.296X_1 + 1.252X_2 + 0.060X_3 + 0.300X_4$$

- $\alpha$  : Constant
- $\beta_1-5$  : Regression coefficient
- $X_1$  : Profitability
- $X_2$  : leverage
- $X_3$  : Liquidity
- $X_4$  : The age of the bonds
- $\ln Y$  : Bond Ratings

The results of this equation, the logistic regression dummy variable has 2 alternatives 1 and 0 related to variable Y. The profitability coefficient value is 53.296, meaning that if profitability is increased by 1% then the bond rating is close to 1 meaning it is very influential because the profitability results are very high compared to other variables. The leverage coefficient value is 1.252, meaning that if leverage is increased by 1%, the bond rating is close to 1, meaning that leverage also affects the Y variable. The liquidity coefficient value is 0.060, meaning that if liquidity is increased by 1%, the bond rating is close to 0, meaning that liquidity has no effect on bond ratings. Bond age coefficient value of 0.300,

Research Hypothesis Test Results. Partially. Hypothesis Test 1. Variable  $X_1$  (Profitability) shows a significant value of 0.008. The significant level used is 0.05, meaning the value of  $0.008 < 0.05$  identifies that  $H_1$  is accepted. The higher this ratio, the better it means that companies that earn high profits are very influential on bond ratings. The results of the study proved that profitability has a large effect on bond ratings. The results of this study are consistent with research conducted by Septyawanti (2013); (Faradi & Supriyanto, 2015); (Pramesti, 2022) and (Aluman et al., 2022) which states that profitability affects the rating of bonds.

Hypothesis Test 2. Variable  $X_2$  (Leverage) shows a significant value of 0.034. The significant level used is 0.05, meaning the value is  $0.034 < 0.05$ , indicating that  $H_2$  is accepted. The high value of the leverage



ratio means that the smaller the assets funded by debt, the smaller the risk of company failure. The research results prove that leverage has an effect on bond ratings. The results of this study are consistent with the research conducted Septyawanti (2013) and (Suharli, 2008) which states that leverage has an effect on bond ratings, but contradicts this (Pramessti, 2022) and (Faradi & Supriyanto, 2015). It can be proven that leverage indicates a rating conducted by PEFINDO using financial performance analysis, namely debt level analysis.

Hypothesis Test 3 Variable X3 (Liquidity) shows a significant value of 0.915. The significant level used is 0.05, meaning the value is  $0.915 > 0.05$ , this indicates that H3 is rejected. Low liquidity indicates a company's risk, causing an inability to meet debt obligations. The research results prove that liquidity has no effect on bond ratings. The results of this study contradict previous research conducted by (Hung et al., 2021) and (Faradi & Supriyanto, 2015) which states that the current ratio has a significant influence on bond ratings. Differences in research results can be caused by differences in samples used with different observation periods and financial reports used. But the results of this study are in accordance with the results of research conducted (Septyawanti, 2013) and Yessy Arifman (2014) concluded that liquidity as measured by CR has no effect on bond ratings, as well (Aluman et al., 2022) which showed a significant negative result. It can be concluded that if the company has greater liabilities than the company's current assets, in other words, the resulting low liquidity ratio is not related to the company's bond rating.

Hypothesis Test 4. Variable X4 (Age of Bonds) shows a significant value of 0.225. The significant level used is 0.05, meaning that the value is  $0.225 > 0.05$ , which indicates that H4 is rejected. Theoretically, the longer the bond maturity, the greater the level of uncertainty, so the greater the maturity risk. However, the results of this study prove that bond age has no effect on bond ratings. Pefindo's rating results do not consider the age of the bonds as a variable that significantly affects the bond ratings. The results of this study are consistent with the research conducted (Suwarmelina, 2021) who concluded that bond age does not have a strong influence on bond ratings so that it is permissible to ignore bond age in investing in bonds, but contradicts (Almilia & Devi, 2007). It can be concluded that bond age is not a benchmark for PEFINDO in assigning ratings.

Simultaneous testing with hypothesis testing 5. This test is to answer problems and hypotheses regarding the influence of independent variables simultaneously or together, by looking at the significance value that exists in the SPSS output results, namely in the Omnibus Test of Model Coefficients table in the significance column compared to the level alpha 0.05. The results can be seen in table 6 below:

Table 6

Omnibus Tests of Model Coefficients				
	Chi-square	Df	Sig.	
step	24,552	4	.000	
Step 1	blocks	24,552	4	.000
	Model	24,552	4	.000

Source: Results of Data Processing (2023)

The results of the Omnibus Test of Model Coefficients in the table above show that the Chi-square value is 24.552 with a degree of freedom = 4 and a significance level of 0.000. The significance value is much smaller than 0.05, so  $H_0$  is accepted, which means that the independent variables (Profitability, Leverage, Liquidity and Bond Age) together have a significant effect on bond ratings. The results of this study are consistent with research Hasan & Dana (2018), (Faradi & Supriyanto, 2015), and (Aluman et al., 2022) states that simultaneously affect the rating of bonds.

## Conclusion

Based on the results of data analysis and hypothesis testing and discussion, some conclusions can be drawn as follows: Partially, Return On Assets or the company's profitability level and the Debt to Equity Ratio or the company's leverage level affect the bond ratings of public companies listed on the IDX in 2017- 2018. Partially, the Current Ratio or the company's liquidity level and bond age have no effect on the bond ratings of public companies listed on the IDX in 2017-2018. Simultaneously, these four variables jointly affect corporate bond ratings and play a role in increasing corporate bond ratings.

As a suggestion, future researchers may consider using all bonds as research objects including financial institutions in the Indonesia Bond Market Directory (IBMD) in order to obtain more valid results. Should consider other variables in accordance with the bond rating assessment mechanism conducted by PEFINDO. The next research period, it is better to use research over 4 or 5 years in order to be able to adjust the age of the bonds at maturity so that it is possible to see the company's ability to pay off its bond debt and minimize the risk of default. Future researchers should use annual reports for more consistency in sample calculations.

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