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The Effect of Leverage, Profitability, Agency Cost, and Inflation Rate in Predicting Company Factor

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Abstract

This study examines the effect of leverage as measured by debt to equity ratio, profitability as measured by return on assets, agency cost and inflation rate in predicting company factor of the financial distress with interest rate volatility as moderating variable. This study's sample is 50 property and real estate companies listed on the Indonesia and Malaysia Stock Exchange from 2014to 2018. The statistical method used for hypothesis testing is obtained from logistic regression analysis with Financial Distress (Y) as the dummy variable. This study uses Altman Z-Score value as a prediction classification of companies experiencing financial distress or nonfinancial distress. The research results showed that leverage had a significant positive effect on financial distress, while the inflation rate had a significant adverse effect on financial distress with a level of significant below 0,05 (p≤ 0,05). The other ratio are profitability, agency cost, and interest rate volatility have no significant effect on the financial distress of property and real estate companies listed on Indonesia and Malaysia Stock Exchange from 2014 to 2018. The result of Moderated Regression Analysis (MRA)effect leverage, profitability, agency cost and inflation rate variable has valued above0,05 (p≥ 0,05), which means interest rate volatility has no significant effect as a moderating variable of leverage, profitability, agency cost and inflation rate on financial distress.

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1. Introduction

The world economy's dynamic requires some companies always to strive to maintain and improve their performance in anticipation of increasingly fierce business competition. Profit is a picture of the company about the performance achieved by the company from the transaction process carried out during a certain period, profit is generally still used as an indicator for stakeholders to assess the extent of a company's performance (Platt & Platt, 2006) Companies that experience negative profits for several years and are no longer able to meet company obligations are indicators of the company experiencing financial difficulties or financial distress.

Financial distress is one of the characteristics of companies that are being hit by financial problems. This problem must be overcome to avoid bankruptcy in the company (Kamaludin & Pribadi, 2011). For this reason, the prediction of financial difficulties as an early warning is very important to anticipate financial distress.

Based on Moody's Investors report, entitled Risk from Leveraged Corporates Grow as Macroeconomic Conditions of Worsen (Tan, 2019). Companies in Indonesia and India are 2 of the 13 countries in Asia Pacific with the highest default risk. Companies in Indonesia are vulnerable to the risk of debt default. This is reflected in the company's revenue which has decreased. In the report there were 11 other countries in the Asia Pacific region that had conducted research including Australia, China, Hong Kong, Japan, Korea, Malaysia, New Zealand, Singapore, Taiwan and Thailand. Ratings issued by the rating agency can be a good early warning. The assessment can be used as a material consideration for decision-makers in the company to increase awareness of changing global economic conditions Bernstein & John, 1998).

Based on Endang related to macroeconomic factors in predicting financial distress, inflation and interest rates influence financial distress, so that if the problem occurs and there are no significant changes to be resolved.Another factor is inflation which can cause a company to experience financial distress, this macroeconomic factor causes an increase in prices continuously and increases in prices that occur in all groups of goods and services (Aulia , 2008). One of the main objectives of macroeconomic policy is to control inflation. The government does this because inflation will have an impact on the people's purchasing power or the value of a country's currency. Inflation control in Indonesia is carried out by the government through Bank Indonesia. There are several macroeconomic indicators that are used to determine the inflation rate for a certain period, one of which is to use the Consumer Price Index (CPI). The CPI shows the price movement of packages of goods and services consumed by the public. High inflation will disrupt economic stability which undermines estimates that the prices of goods and services will continue to rise and affect economic activity (Mankiw, 2013).

The factors causing financial difficulties can be grouped into three parts, namely macro economic conditions, industrial policies and financial conditions, the behavior of debtors and creditors (DP & Wulandari, 2014). Besides inflation, interest rates are also used as a moderating variable. The interest rate is the price that connects the present and the future. There are two interest rates, namely the real and nominal interest rates. Economists mention that the interest rate paid by banks as the nominal interest rate and the increase in people's purchasing power with the real interest rate. The real interest rate is the difference between the nominal interest rate and the inflation rate. The interest rate can change for two reasons, namely because the real interest rate changes or because the inflation rate changes (Mankiw, 2013). In the current study, the calculation of interest rate variables uses interest rate volatility.

2. Materials and Methods

The research method is basically a scientific way to get data with specific purposes and uses. The scientific way means this research activity is based on scientific characteristics, namely rational, empirical and systematic (Samadara, 2020). The statistical method used for hypothesis testing is logistic regression analysis with Financial Distress (Y) as a dummy variable. This study uses the Altman Z Score analysis to predict the condition of companies experiencing distress or non-financial distress. The object of this study is the Financial Distress in property and real estate companies listed on the Indonesia and Malaysia Stock Exchanges related to leverage, profitability, agency costs, inflation rates and interest rate volatility. This research was conducted for five years, namely 2014 to 2018. The population used as the object of research was property and real estate companies listed on the Indonesia and Malaysia Stock Exchanges during the 2014-2018 period.

3. Results and Discussions

Homogeneity Test

Homogeneity test is the variation test between groups tested is different or not. The variance is homogeneous or heterogeneous (Nisfiannoor, 2009).

Table 1 Homogeneity Test
Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
ROA	,175	1	150	,676
DER	1,928	1	150	,167
Agency Fees	,087	1	150	,768
Inflation Rate	2,044	1	150	,155
Interest Rate Volatility	,235	1	150	,628

Source: Results of Data Processing Using SPSS

Homogeneity test in this study uses ANOVA. Homogeneity test results in Table 1 column Levene Statistics obtained significance values> 0.05 then the data is assumed to have the same variance.

Independent Sample Test

To find out whether or not there is an average difference between the two dependent sample groups, an average difference test is performed on the results of the altitude z score ratio.

Table 2
Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Altman Z Score	Distress	,848	,359	,953	150	,342	,35338	,37080	-,37930	1,08605
	Non Distress			,915	36,562	,366	,35338	,38633	-,42972	1,13647

Source: Results of Data Processing Using SPSS

Sig (2-tailed) values obtained in table 2 are 0.342 for distress companies and 0.366 for non-distress companies. This value is greater than α> 0.05, so it can be concluded that there is no difference in the average ratio between the two sample categories. This means that the sample used has met all the criteria to be processed for the next research phase.

Multicollinearity Test

To conduct this multicollinearity analysis, a partial test approach was performed by comparing each of the main Square variables (with the distress variable) compared to the R-square of each of the variables concerned. If the value of Rsquare> R1, R2, R3, R4, R5 then there is no multicollinearity in the model. If the value of R-square <RI, R2, R3, R4, R5 then the model is found to be multicollinearity. The results of the analysis with eviews 9 obtained a summary as follows:

Table 3
Multicollinearity Test

No.	Independent Variable	R-square	Criteria
1.	Financial Distress	0,59	-
2.	Return On Asset	0,19	There is no multicollinearity
3.	Debt to Equity Ratio	0,11	There is no multicollinearity
4.	Agency Fees	0,16	There is no multicollinearity
5.	Inflation Rate	0,43	There is no multicollinearity
6.	Interest Rate Volatility	0,40	There is no multicollinearity

Source: Results of Data Processing Using SPSS

From the results above, Rsquare value of each variable, there are five variables that do not experience multicollinearity. These variables are Return On Assets, Debt to Equity Ratio, Agency Costs, Inflation Rate and Interest Rate Volatility.

Nagelkerke R-Square Test

This test is conducted to see the model's significance and how much influence the independent variable gives to the dependent variable. The results of this analysis are obtained by using SPSS with the following table:

Table 4 Nagelkerke R-Square
Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	,000[a]	,608	1,000

The estimation terminated at iteration number 20 because maximum iterations has been reached. Therefore, the final solution cannot be found. The output results on Cox-Snell R2 and Nagelkerke R have the same analogy with the value of R2 in ordinary regression to measure the strength of the relationship of the model. In the SPSS output table above, it is shown that the Cox-Snell R2 value is 0.701 Nagelkerke R2 is more common and is considered a better indication for the strength of the relationship. In this analysis the indication of Nagelkerke R2 has a value of 1,000, which means that the 5 independent variables in explaining the variance of financial distress that occurs in property and real estate companies is 100%.

Chi Square dan Hosmer and Lemeshow Test

The accuracy of the regression model test is used to assess the accuracy of the regression model, in this study measured by the chi-square value with the Hosmer and Lemeshow Test. This test by looking at the value of goodness of fit test as measured by the value of chi square at a significant level of 5%. The hypotheses for measuring model fit are as follows:

H0 = hypothesis model fit with data;
H1 = the hypothesized model does not fit the data.

Table 5
Uji Chi-Square dan Hosmer and Lemeshow Test
Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	,000	8	1,000

Source: Results of Data Processing Using SPSS

From the above table shows the value of the chi square statistic is smaller than 0.05, this indicates that the model is significant. As for the value of Hosmer and Lomeshow Goodness of Fit the probability is significant. 1,000 values are well above 0.05, this means that H0 is accepted and H1 is rejected and proves that the empirical data matches or matches the model (there is no difference between the model and the data so the model can be said to be fit). Thus it can be concluded that the logistic regression model is feasible to predict the level of financial distress of manufacturing companies.

Logistic Regression Analysis

The logistic regression equation from the outputs of Eviews 9 is used to find out any changes in the independent variables on the level of distress experienced by property and real estate companies. The results of the logistic regression equation from the results of Eviews 9 are as follows:

Table 6
Logistic Regression Result

Variables	Coefficient	Std. Error	z-Statistic	Probability
C	-3.485536	1.254909	-2.777522	0.0055
ROA	-0.201743	0.133470	-1.511523	0.1307
DER	6.119670	1.226606	4.989110	0.0000
Agency Fees	1.552145	1.646675	0.942593	0.3459
Inflation Rate	-72.71552	25.67243	-2.832436	0.0046
Interest Rate Volatility	1.776529	1.355363	1.310741	0.1899

The Debt to Equity Ratio (DER) variable has a positive coefficient of 6.11966. This means that any increase in DER will increase the level of financial distress experienced by the company. Same thing is the agency cost variable which has a positive coefficient of 1.55214 meaning that any increase in agency costs is likely to increase financial distress.

The inflation rate variable has a negative coefficient, which means that for each increase in one agency cost variable, the likelihood of a company decreasing financial distress. Interest rate volatility has a positive coefficient of 1.7765. This means that the interest rate volatility variable has a positive effect. Every increase of one variable of interest rate volatility, the possibility of the company experiencing financial distress will increase too.

F-Statistic Test

The results of the F Test equation can be seen in the lower panel F-statistics values in table 7 to see the significance of the regression model.

Table 7
F-Statistic Test

McFadden R-squared	0.558581	Mean dependent var	0.177632
S.D. dependent var	0.383466	S.E. of regression	0.240177
Akaike info criterion	0.491924	Sum squared resid	8.421996
Schwarz criterion	0.611288	Log likelihood	-31.38626
Hannan-Quinn	0.540414	Deviance	62.772

criter.			51
Restr. deviance	142.2061	Restr. log likelihood	-71.10303
LR statistic	79.43354	Avg. log likelihood	-0.206489
Prob(LR statistic)	0.000000		

Source: Results of Data Processing Using eviews 9

The results of the Prob (F-statistic) in table 4.11 are 0,000 less than the alpha significance level of 0.05. In other words the independent variables analyzed affect the financial distress experienced by a company.

Moderated Regression Analysis (MRA)

MRA Leverage on Financial Distress with Interest Rate Volatility as a Moderation Variable

The probability value of leverage interaction with interest rate volatility (Z2) of 0.2129 is greater than 0.05 with a t-statistic value of 1.250937. This means that interest rate volatility cannot moderate the relationship between leverage and financial distress.

MRA Profitability Test for Financial Distress with Interest Rate Volatility as a Moderation Variable

Table 8
MRA Profitability- Interest Rate Volatility

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.050432	0.016828	-2.996915	0.0032
ROA	-0.002569	0.003666	-0.700603	0.4847
Interest Rate Volatility	0.301139	0.008602	35.00885	0.0000
Z1	0.000809	0.002007	0.403148	0.6874

Source: Results of Data Processing Using eviews 9

In table 8 the probability value of profitability interaction with interest rate volatility (Z1) of 0.6874 is greater than 0.05 with a t-statistic value of 0.403148. This means that interest rate volatility cannot moderate the relationship between profitability and financial distress.

MRA Agency Cost for Financial Distress with Interest Rate Volatility as a Moderation Variable

Table 9
MRA Agency Cost-Volatilitas Suku Bunga

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.067194	0.016364	-4.106148	0.0001
Agency Fees	0.047116	0.061833	0.761986	0.4473
Interest Rate Volatility	0.278945	0.014411	19.35615	0.0000
Z3	0.091449	0.049133	1.861274	0.0647

Source: Results of Data Processing Using eviews 9

In table 9, the probability value of agency cost interaction with interest rate volatility (Z3) of 0.0647 is greater than 0.05 with a t-statistic value of 1.861274. This means that interest rate volatility cannot moderate the relationship between agency costs and financial distress.

MRA Inflation Rate for Financial Distress with Interest Rate Volatility as a Moderation Variable

Table 10
MRA Inflation Rate-Interest Rate Volatility

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039115	0.026369	-1.483365	0.1401
Inflation Rate	-0.540167	0.636163	-0.849101	0.3972
Interest Rate Volatility	0.298192	0.010265	29.05047	0.0000
Z4	8.31E-07	1.45E-06	0.573340	0.5673

Source: Results of Data Processing Using e-views 9

In table 10 the probability value of the interaction of the inflation rate with interest rate volatility (Z4) of 0.5673 is greater than 0.05 with a t-statistic value of 0.573340. This means that interest rate volatility cannot moderate the relationship between inflation and financial distress.

Hypothesis Test

H1 : Leverage has a positive effect on Financial Distress

Based on table 6 shows that Debt to Equity Ratio (DER) has a significant effect on financial distress. This can be seen from the level of significance that is below 0.05, which is 0. There is an influence of the variable leverage (DER) on a company's financial distress. The results of this hypothesis indicate that if the company uses more debt, then the risk of financing difficulties in the future, this is because the amount of debt is greater than the assets owned. The results indicate the H1 hypothesis is accepted.

H2 : Profitability has a negative effect on Financial Distress

The results in table 6 show that Return On Assets (ROA) does not have a significant effect on financial distress because it has a significance above 0.05 which is 0.1307. If profitability or the company's ability to obtain low profits will affect the conditions for experiencing financial distress. Although it has no effect but based on descriptive statistical results the ROA variable for distress and non-distress company categories has a very different average, for ROA companies that experience financial distress fluctuate more than those who do not experience financial distress, this is indicated by the net income earned by the company This is greater than the total assets owned. The hypothesis H2 is rejected and accepts H0.

H3: Inflation rate has a positive effect on Financial Distress

Based on table 6 shows that the inflation rate has a significant effect on financial distress. This can be seen from the level of significance which is below which is 0.0046. The influence of the inflation rate variable indicates that changes in the inflation rate will affect a company's financial distress. Inflation causes the prices of all goods to begin to rise, this condition will reduce the level of purchasing power of the people, so the company experiences a decrease in income. If these conditions take place continuously, then the company will suffer losses and can trigger financial distress. While the coefficient value of the variable inflation rate is negative at -72.71 which indicates that an increase in the inflation rate will reduce financial distress. The results show rejecting H3 hypothesis.

H4: Agency costs have a positive effect on Financial Distress.

Based on the results in table 6 shows that agency costs do not affect financial distress. This can be seen from the probability value that is above 0.05. It can be concluded that companies that have large agency costs and cause instability of company resources do not affect the financial distress of a company. So it can be concluded that agency costs do not affect the financial distress and cannot cause the financial condition of a company to decrease. From these results the alternative hypothesis (H4) proposed was rejected and accepted the null hypothesis (H0).

H5: Interest rate volatility has a positive effect on Financial Distress.

The results that show interest rate volatility affect financial distress shown in table 6, namely there is no effect on financial distress because it has a significance value above 0.05. This means that

interest rate volatility is not a macroeconomic factor that can cause a company to experience financial distress. The higher interest rates are not proven to increase a company's interest expense that can cause the company's financial condition to deteriorate. This happens because in the calculation of corporate earnings many expenditure items other than interest expense can be able to print a company's profit. While the coefficient of the variable interest rate volatility shows a positive sign which means that any increase in interest rate volatility will improve the financial distress condition of a company. The results show rejecting H5 hypothesis.

H6 : Interest rate volatility can moderate the relationship between leverage and Financial Distress.

Moderate Variable Analysis test results shown in table 8 show that the leverage with interest rate volatility of 0.2129 is greater than 0.05. This means that interest rate volatility cannot moderate the relationship between leverage and financial distress. The results of the sixth hypothesis (H6) were rejected.

H7: Interest rate volatility can moderate the relationship between profitability and financial distress.

In table 9 the probability value of profitability interactions with interest rate volatility of 0.6874 is greater than 0.05. The results of the seventh hypothesis (H7) were rejected.

H8: Interest rate volatility can moderate the relationship between agency costs and Financial Distress.

In table 10 the probability value of the interaction of agency costs with interest rate volatility of 0.0647 is greater than 0.05. The results of the eighth hypothesis (H8) which states that interest rate volatility can moderate the relationship between agency costs and financial distress are rejected. In table 11 the probability value of the interaction of the inflation rate with the interest rate volatility of 0.5673 is greater than 0.05. The results of the ninth hypothesis (H9), which states that interest rate volatility is able to moderate the relationship between the rate of inflation and financial distress are rejected.

Research conducted to determine the effect of a company's financial distress by using logistic regression analysis on property and real estate companies on the Indonesia Stock Exchange and Malaysia Stock Exchange. In this study the authors make a hypothesis about the logistilk regression analysis method used to predict the financial distress condition of a company. By looking at the Chi Square test and the Hosmer and Lemeshow Test which has been carried out the value of the chi square statistic less than 0.05 indicates that the logistic regression model used in this study is significant. Whereas the value of Hosmer and Lomeshow Goodness of Fit is worth 1,000, the value is far above 0.05, this shows that there is no difference between the model and the data so that the model can be said to be fit. Thus it can be concluded that the logistic regression model in this study is feasible to predict the level of financial distress of property and real estate companies.

There are 9 hypotheses in this study that are used to see how much influence the independent variable has on financial distress with the conclusion of the hypothesis that leverage and inflation have an influence on financial distress while profitability, interest rate volatility and agency costs do not have an influence on financial distress.

The contribution of this research is to provide information for internal and external parties of the company regarding the logistic regression analysis method that can be used as a tool to predict the company's financial distress. The leverage ratio in this case Debt to Equity Ratio (DER) and the rate of inflation can be used to evaluate the condition of a company to then make decisions. Parties

such as financial institutions, investors, regulators, auditors and management. For investors, this model can help when assessing the possibility of a company's problems in repaying principal and interest. For auditors can be a useful tool in making a going concern assessment of a company.

4. Conclusion

Based on the findings obtained in the study of the effects of leverage, profitability, inflation rates, agency costs and interest rate volatility of property and real estate companies listed on the Indonesia and Malaysia Stock Exchanges it can be concluded that:

a. Companies with high levels of leverage can cause financial distress. Leverage is an important ratio to consider when analyzing a company's financial condition. If the ratio is high, then it can be interpreted that the company's financial resources are more charged by bank loans.

b. Companies with high levels of profitability do not affect the financial distress condition of a company because when company profits decline the company can still meet obligations and other costs by using internal and external funds.

c. The use of inflation as a macroeconomic factor is able to predict the influence of a company's financial distress.

d. The use of agency costs incurred by the company does not prove to affect the financial distress condition of a company.

e. Projected interest rate volatility has an effect on the financial distress condition of a company apparently does not significantly affect the financial distress condition of the company but rather affects the debt of a company. Likewise, interest rate volatility has not been proven to moderate the relationship between the variables of leverage, profitability, agency costs, inflation rates to financial distress.

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