THE EFFECT ANALYSIS OF EARNING MANAGEMENT AND FAMILY CONTROL ON THE Z-SCORE MODEL OF FINANCIAL DISTRESS PREDICTION

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Abstract. The validity of the use of financial statements as a source of information for detecting financial distress is questionable because of the opportunist behaviour of the company's management. This study aims to analyse the effect of accrual earnings management, real earnings management, and family control on the Z-score financial distress prediction. Using the sample that includes 372 firm years of observations for the 2017 to 2019 periods listed on the Indonesia Stock Exchange, this study found that accrual earnings management, real earnings management, and family control variables affect the Z-score financial distress prediction and cause a higher probability for the company to be in the category of better financial condition. The novelty of this study lies in earnings management and family control as factors that affect the category of assessment and the probability of assessing the company's financial condition as a better company. Empirical evidence from this study is important for investors and company creditors, as input to consider these factors in using the company's financial distress prediction model. For standard setters, the results of this study can be used as input for establishing corporate governance design rules to improve the quality of financial information.

Keywords: accrual earning management, real earning management, family control, financial distress, financial statement, Z-score model prediction.

JEL Classification: M41, G17, G33.

Introduction

Currently, the validity of using financial statements as a source of information to predict and detect financial distress is questionable. This is because these methods are not aware of the possibility of earnings manipulation which may change the basic picture of accounting and its implications for investor decision models. These methods tend to be biased depending on the accounting method used by the company (Utami et al., 2020).

One of the prediction models that is often used is the Z-score model which was coined by Altman in 1968 and has been revised several times. Although the Altman Z-score model was developed more than 50 years ago and many alternative bankruptcy prediction models exist, the Z-score model continues to be used around the world as a primary or supporting tool for the prediction and analysis of bankruptcy or financial distress both in research and in practice (Altman et al., 2017).

One of the main characteristics of the Z-score is the use of financial reporting as a source of information to measure whether the company is in financial distress or not. The literature review conducted by Černius and Birškytė (2020) revealed that accounting information is very important in making various types of managerial decisions. The choice of certain accounting policy methods can cause the information presented to be inaccurate and not useful for decision making. Specifically, Z-score values are obtained using key accounting numbers along with stock market information. Thus, accounting attributes play an important role in formulating the Z-score value. The Z-score depends on accounting numbers, so any changes in accounting records can cause distortions in the Z-score (Cho et al., 2012).

Although the Altman Z-score prediction model is a model that is often used by researchers, investors, and creditors to analyze the potential for bankruptcy of issuers, the prediction accuracy using this model varies. The
The existence of stronger control over management provides incentives for controlling shareholders to interfere in all managerial and operational activities of the company, thereby triggering the exploitation of the welfare of non-controlling shareholders and causing information asymmetry between controlling and non-controlling...
shareholders. Information asymmetry occurs when the controlling shareholder has access to the company's private information through its control over management who are directly involved in the company's operations. According to Byun et al. (2011) and Villalonga and Amit (2006) the level of information asymmetry increases with the concentration of ownership, and the increase in information asymmetry occurs along with an increase in informed trading involving informed traders such as controlling shareholders and other parties who have connections with management.

The controlling shareholder, namely the family, will have the ability to control the management to take actions following their interests and to expropriate the welfare of non-controlling shareholders. Agency theory predicts that family firms have lower accounting practices than non-family firms because family firms are concentrated ownership which allows majority shareholders to dominate the board of directors, thereby exacerbating conflicts of interest between majority and minority shareholders (Anderson & Reeb, 2003).

However, a different opinion was expressed by Boonlert-U-Thai and Sen (2019) who provide empirical evidence that Compared to other organizations, founding family businesses had stronger earnings persistence and accrual quality. This indicates that the role of management who is also the owner of the company has an interest in a long-term perspective to protect the company which will then be passed on to the next generation so that management is not concerned with short-term personal interests that can lead to poor financial reporting quality. This can be an indication that the earnings management behavior of family companies is not opportunistic so the impact on information asymmetry is also small. Virgiawan and Diyanty (2015) also show that family-controlled companies are not proven to have a higher level of information asymmetry than companies controlled other than families.

The argument that shows differences in views from the results of previous studies is interesting to study further about the impact of earning management and family control (FC) to the Z-score financial distress prediction and the probability of the occurrence of information asymmetry in the form of a higher tendency or probability in the presentation of information or figures in the financial statements indicating that the company's financial condition is better or healthier.

This study is very useful because there has been no previous research that has comprehensively examined the effect of earnings management and family control factors on the Z-score and its effect on the probability of a company being categorized as a company with better financial conditions. This study is important to obtain input to increase the prediction accuracy of the Z-score. For investors and creditors, it can be used as input in using the company's financial distress prediction method to manage their risk profile more effectively. For standard setters and capital market managers, it can be used as input for establishing corporate governance design rules to improve the quality of decision-making related to values or figures in financial statements.

1. Literature review and hypothesis development

1.1. Theoretical basis

An agency relationship as a form of relationship in which the principal delegates the authority to make decisions to the agent to carry out services on behalf of the principal (Jensen & Meckling, 1976). The basic principle of agency theory asserts that there exists a functioning relationship, or "nexus of contract", between the party who grants authority (principal), in this case the investor, and the party who receives authority (agent), in this case the management (Mukhtaruddin et al., 2018). The problem that arises as a result of this corporate ownership system is that agents do not always make decisions that aim to fulfilled the best interests of the principal (Jensen & Meckling, 1976). Agency theory explains that the information asymmetry between managers and stakeholders is high. So that with the existence of information asymmetry, it will further increase the opportunity for managers to practice EM (Pasko et al., 2021).

The assumption is individuals act to maximize their own interests, which leads agents to use information asymmetry to hide some facts from the principal. When there is information asymmetry and a conflict of interest between the principle and the agent, the agent is more likely to give the principal false information, particularly if that information is connected to the agent's performance evaluation. This prompts employees to consider how they may utilize these accounting figures to further their own interests (Ajina & Habib, 2017). One form of action of the agent is called earnings management. Earnings management is considered a process used by managers to modulate results.

In addition, due to the stronger involvement of the family, the potential for differences in interests that cause agency conflicts to arise will also be greater. The multiple roles of family members in the business foster singular conflicts with family members outside the business or ownership group (Villalonga et al., 2015). The existence of stronger control over management provides incentives for controlling shareholders to interfere in all managerial and operational activities of the company, thereby triggering the exploitation of the welfare of non-controlling shareholders and causing information asymmetry between controlling and non-controlling shareholders.

The Signalling Theory explains why a corporation submits or gives outside parties access to information about its financial results. Due to the information gap between corporate management and outside parties, there is a strong incentive to share financial statement information with them (Bergh et al., 2014). For this reason, what the company can do is give signals to outsiders through the company's financial statements in which there is credible or trustworthy company financial information and will
provide information about the prospects for the company's sustainability in the future.

1.2. Empirical overview and hypothesis development

The results of previous studies indicate that earnings management can correct the distortions resulting from the use of an unadjusted bankruptcy prediction model. Cho et al. (2012), which compared the Altman Z-score model adjusted for the unadjusted model to test the level of bias in the Z-score calculation, found that there is a significant upward bias in income increasing type of earnings management which reduces the possibility of bankruptcy. On the other hand, in the case of income decreasing, the probability of bankruptcy is overstated. Utami et al. (2020) research show that the adjustment of earnings management in the adjusted Z-score model shows a decrease in type 1 error and type 2 error in the Z-score model. du Jardin et al. (2019) also show that when AEM is measured and used with other financial variables, the model is more accurate than one that relies solely on pure financial data and shows that the increase in model accuracy is primarily due to a reduction in type 1 error.

The results of these studies indicate that AEM is a factor that can affect the Z-score and affect the probability of assessing the company's bankruptcy.

H1a: Accrual Earnings Management affects the Z-score financial distress prediction.

H1b: Accrual Earnings Management causes a higher probability for the company to be in the category of better or healthier financial condition.

REM activities start from normal operational practices, which occur because managers who wish to deceive and even mislead stakeholders who want to know the performance and condition of the company. Techniques that can be used in REM include sales manipulation, overproduction, and discretionary expense reduction (Roychowdhury, 2006).

Roychowdhury (2006) provides empirical evidence that companies perform REM to avoid reporting losses. The results of Namazi et al. (2019) clearly demonstrate the relationship between abnormal operational cash flow costs, discretionary abnormal production costs, discretionary abnormal costs, and the likelihood of bankruptcy for each having a positive, negative, and insignificant effect. Lin et al. (2016) show that without taking into account the effect of REM on the prediction of default, the probability of survival is overestimated for firms with aggressive REM and underestimated for firms with lower REM. Li et al. (2021) showed that REM was chosen as a strong predictor of the main difficulty through the LASSO (Least Absolute Shrinkage and Selection Operator) variable selection technique. These results indicate that REM is a factor that can affect the Z-score and affect the probability of assessing the company's bankruptcy.

H2a: Real Earnings Management affects the Z-score financial distress prediction.

H2b: Real Earnings Management causes a higher probability for the company to be in the category of better or healthier financial condition.

In a family business, the controlling owner usually has sufficient power to ensure that the company pursues its interests and goals (Anderson & Reeb, 2003). The existence of stronger control over management provides incentives for controlling shareholders to interfere in all managerial and operational activities of the company, thereby triggering the exploitation of the welfare of non-controlling shareholders and causing information asymmetry between controlling and non-controlling shareholders.

Information asymmetry occurs when the controlling shareholder has access to the company's private information through its control over management who are directly involved in the company's operations. According to Byun et al. (2011) and Villalonga and Amit (2006), the level of information asymmetry increases with the concentration of ownership, and occurs along with an increase in informed trading involving informed traders such as controlling shareholders and other parties who have connections with management. Gómez-Mejía et al. (2007) confirmed that family firms have a contingent view of risk. They tend to fall into performance hazards and accept underperforming to keep control of the company, despite the risk's potential to exacerbate insolvency and the loss of socio-emotional wealth.

H3a: Family Control affects the Z-score financial distress prediction.

H3b: Family Control causes a higher probability for the company to be in the category of better or healthier financial condition.

2. Research method

2.1. Sampling and variable measurement

This research is causality research. The population in this study are publicly listed manufacturing companies on The Indonesia Stock Exchange (IDX) from 2017 to 2019. Consideration of using company financial report data from 2017 to 2019 for reasons of updating data. In 2020 and 2021, extraordinary conditions occurred, namely the Covid-19 pandemic, which hit the world including in Indonesia. These conditions have had a significant effect on the financial performance of companies in Indonesia (Tahu & Yuesti, 2021). So that the financial distress prediction model formed is not biased due to the influence of pandemic factors, and the model can be generalized to normal conditions in the future, data for 2020 and 2021 are not used.

The sampling technique used in this study is purposive sampling with the type of judgment sampling where the sample companies are taken based on criteria as follows:
1. The company is classified as a manufacturing industry.
2. No delisting from 2017 to 2019.
3. The financial report date ends December 31 and issues an annual report for the period 2017–2019 which has been published either through the IDX website or the company’s website.
4. Have complete data in accordance with the research objectives.

The data used is panel data in the form of company annual report data obtained from the IDX website and the company website.

This study examines the effect of independent variables: AEM, REM and FC on the dependent variable: Z-score financial distress prediction. The measurement of each variable as follows:

a) Accrual Earnings Management (AEM)
AEM is proxied by Discretionary Accruals using The Modified Jones model. This model can detect earnings management better than other models (Dechow et al., 1995). The calculation model is as follows:

\[
TACC_{it} = \text{EBXT}_{it} - \text{OCF}_{it}; \quad (1)
\]

\[
TACC_{it}/TA_{it-1} = \alpha_1(1/TA_{it-1}) + \alpha_2(\Delta\text{REV}_{it}/TA_{it-1}) + \alpha_3(\text{PPE}_{it}/TA_{it-1}); \quad (2)
\]

NDACC can be calculated by re-entering the coefficients

\[
\text{NDACC}_{it} = \alpha_1(1/TA_{it-1}) + \alpha_2((\Delta\text{REV}_{it} - \Delta\text{REC}_{it})/TA_{it-1}) + \alpha_3(\text{PPE}_{it}/TA_{it-1}); \quad (3)
\]

\[
\text{DACC}_{it} = (TACC_{it}/TA_{it-1}) - \text{NDACC}_{it}. \quad (4)
\]

Information:
- \( TACC_{it} \): Total Accrual of company \( i \) in period \( t \);
- \( \text{NDACC}_{it} \): Non-Discretionary Accruals of a company \( i \) in period \( t \);
- \( \text{DACC}_{it} \): Discretionary Accruals of a company \( i \) in period \( t \);
- \( \text{EBXT}_{it} \): Earning Before Tax of a company \( i \) in period \( t \);
- \( \text{OCF}_{it} \): Operating Cash Flow of a company \( i \) in period \( t \);
- \( TA_{it-1} \): Total Assets of a company \( i \) in period \( t-1 \);
- \( \text{REV}_{it} \): Revenue of a company \( i \) in period \( t \);
- \( \text{REC}_{it} \): Receivables (net) of a company \( i \) in period \( t \);
- \( \text{PPE}_{it} \): Property, Plant and Equipment (gross) of a company \( i \) in period \( t \).

b) Real Earning Management (REM)
Measurement of REM refers to the measurement developed by Roychowdhury (2006). In this study, the measurement of each proxy uses residual.

1. Abnormal Cash Flow Operation

\[
\text{CFO}_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \beta_1(S_{it}/A_{it-1}) + \beta_2(\Delta S_{it}/A_{it-1}) + e_{it}. \quad (5)
\]

2. Abnormal Production Costs

\[
\text{PROD}_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \beta_1(S_{it}/A_{it-1}) + \beta_2(\Delta S_{it}/A_{it-1}) + \beta_3(\Delta S_{it-1}/A_{it-1}) + e_{it}. \quad (6)
\]

d) Z-Score Financial Distress Prediction

To measure this variable, the researcher first determines the category of the financial condition of each company using the Altman Z-Score model with the following formula:

\[
Z\text{score} = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5. \quad (8)
\]

Information:
- \( X_1 \): Working Capital/Total Assets;
- \( X_2 \): Retained Earnings/Total Assets;
- \( X_3 \): Earnings Before Interest and Tax/Total Assets;
- \( X_4 \): Market Value of Equity/Total Assets;
- \( X_5 \): Revenue/Total Assets.

The cutoff values for determining the criteria are: If the Z value < 1.81: the category of the company is experiencing financial difficulties; if the Z value is between 1.81 to 3: the grey area category; and if the Z value > 3: the healthy category.

2.2. Data analysis method

To prove the hypothesis, this study uses a multinomial logit regression analysis method with the consideration that the model is suitable for use if the dependent variable
is a non-metric variable and has more than two categories while the independent variable is a metric and/or non-metric variable (Widarjono, 2020). The multinomial logit model is used to model the effect of independent variables on the probability of categorizing companies into three categories, namely companies experiencing financial distress (category 1), grey area (category 2), and healthy (category 3).

1) In the multinomial logit regression model, the evaluation of the results carried out includes (Widarjono, 2020):  
2) Assessment of goodness of fit model. 
3) Test the significance of the effect of all independent variables simultaneously on the dependent variable (overall model fit).

Test the significance of the effect of the independent variable on the dependent variable individually (significance test).

Next, the researchers analyse the model that was formed. Because the dependent variable has 3 categories, the researcher sets the basis for comparison (base/reference category) in category 3, namely the category of a healthy company. Thus, there are 2 models formed, namely:

Model 1: Probability of category 1 against category 3
\[
\ln \left( \frac{P_1}{P_3} \right) = \beta_{01} + \beta_{11}X_{11} + \beta_{21}X_{21} + \beta_{31}X_{31}. 
\]  
(9)

Model 2: Probability of category 2 against category 3
\[
\ln \left( \frac{P_2}{P_3} \right) = \beta_{02} + \beta_{12}X_{12} + \beta_{22}X_{22} + \beta_{32}X_{32}. 
\]  
(10)

Furthermore, the analysis of the significance of the independent variable was carried out through the Wald Test.

3. Results

3.1. Data quality test results

Based on the criteria used, the selected sample is 124 companies for 3 years, so the total data to be observed is 372. The data in Table 1 shows that, from 372 observations, the number of observations that fall into the category of financial distress firm group is 38.7%, gray the firm group area is 23.4% and the healthy firm group is 37.9%. Data on companies whose CEOs have family affiliations are as much as 19.9% and 80.1% do not have family affiliations.

Statistics-2 Log Likelihood is used to determine if the independent variable is added to the model and whether it significantly improves model fit. The overall model testing aims to test whether the use of independent variables in the study can make the model better (Widarjono, 2020) in explaining the choice of company categories to become companies experiencing financial distress, grey area, and healthy.

Based on the information from Table 2, we show that entering the independent variable into the model will produce a better model than the model that only includes the intercept. This is evidenced by the decrease in the value of −2log likelihood by only entering the intercept giving a value of 799,732, while by including the independent variable the value of −2 log-likelihood decreases to 709.901 or a decrease in chi-square of 54,747 with a significance of p = 0.000. So that the model with independent variables is better for predicting companies into the specified category.

Table 2. Model fitting information  
(source: processed data, 2022)

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Fitting Criteria</th>
<th>Likelihood Ratio Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 Log Likelihood</td>
<td>Chi-Square</td>
<td>df</td>
</tr>
<tr>
<td>Intercept Only</td>
<td>799.732</td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>709.901</td>
<td>89.831</td>
</tr>
</tbody>
</table>

Furthermore, a test is carried out to see the significance of the regression results. The significance value of Goodness of Fit is greater than 0.05 which indicates that the existing model can predict the value of the observation or the model can be accepted because it matches the observation data.

Table 3 provides information on whether the model fits the data through the Pearson X² and Deviance X² tests. Both tests are not statistically significant so they fail to reject the null hypothesis. This means that the model can explain the data well (Widarjono, 2020). Meanwhile, to measure the proportion of data variation described by the model, using Pseudo R-Square.

Table 3. Goodness-of-Fit Test (source: processed data, 2022)

<table>
<thead>
<tr>
<th></th>
<th>Chi-Square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>762.092</td>
<td>736</td>
<td>0.245</td>
</tr>
<tr>
<td>Deviance</td>
<td>709.901</td>
<td>736</td>
<td>0.749</td>
</tr>
</tbody>
</table>

Based on the information from Table 4, Nagelkerke’s value shows that the variables AEM, REM, and FC in the multinomial logit model can explain the decision to categorize companies into companies experiencing financial distress, grey area, and healthy as much as 24.3%.
### 3.2. Hypotheses test results

After obtaining a multinomial logistic regression model that is fit and does not require model modification, then hypothesis testing is carried out.

#### Table 5. Likelihood ratio test results (source: processed data, 2022)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Model Fitting Criteria</th>
<th>Likelihood Ratio Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>–2 Log Likelihood of Reduced Model</td>
<td>Chi-Square</td>
</tr>
<tr>
<td>Intercept</td>
<td>709.901*</td>
<td>.000</td>
</tr>
<tr>
<td>AEM</td>
<td>722.487</td>
<td>12.585</td>
</tr>
<tr>
<td>REM</td>
<td>766.705</td>
<td>56.804</td>
</tr>
<tr>
<td>FC</td>
<td>727.865</td>
<td>17.964</td>
</tr>
</tbody>
</table>

The results of the Likelihood Ratio Test on Table 5, show the effect of each independent variable on the dependent variable. Variables that have a significant effect on the prediction of the company’s financial distress are AEM (X1) with a significance value of 0.002 < 0.05, REM (X2) with a significance value of 0.000 < 0.05, and FC (X3) with a significance value of 0.000 < 0.05. This shows that all the selected independent variables have a significant effect on the dependent variable.

The next stage is the formation of a multinomial logit regression model. The first model formed, based on the data in Table 6, shows the probability that a company is categorized as a company experiencing financial distress (category 1) compared to a healthy company (category 3) is:

\[
\ln \left( \frac{P_1}{P_3} \right) = 0.675 - 4.431X_1 - 1.715X_2 - 0.178X_3. \quad (11)
\]

Wald’s test for each variable is:

- **AEM (variable X1)**
  - The test results show that AEM has a significant effect on financial distress predictions because the significance value of 0.003 is smaller than the 0.05 significance level. The negative coefficient (−4.431) indicates that if there is an increase in AEM, the probability of the company being categorized as a healthy company (category 3) is higher than being categorized as a company experiencing financial distress.

- **REM (variable X2)**
  - The test results show that REM has a significant effect on financial distress predictions because the significance value of 0.000 is smaller than the 0.05 significance level. The negative coefficient (−1.715) indicates that if there is an increase in REM, the probability of the company being categorized as a healthy company (category 3) is higher than being categorized as a company experiencing financial distress.

- **FC (variable X3)**
  - The test results show that FC is not significant because the sig value of 0.617 is greater than the 0.05 significance level.

Thus, based on the results of the model 1 test, the variables of AEM and REM have a significant effect on the probability that the company is categorized as a company that has better financial conditions.

The second model formed, based on the data in Table 7, shows the probability that a company is categorized as a grey area company (category 2) compared to a healthy company (category 3) is:

\[
\ln \left( \frac{P_2}{P_3} \right) = 0.657 + 0.574X_1 - 0.167X_2 - 1.283X_3. \quad (12)
\]
Conclusions and discussion

This study provides empirical evidence of the importance of considering the factors that affect the value or numbers presented in the financial statements. This is because the Z-score prediction model that uses financial statement data is very vulnerable to the possibility of earnings manipulation which could change the basic picture of accounting and its implications for investor decision models. This study has examined and proven that all the proposed hypotheses are supported.

This study provides empirical evidence that AEM has a significant effect on the prediction of the company's financial distress. Agency theory, which assumes that individuals act to maximize themselves, causes agents to take advantage of their information asymmetry to hide some information that the principal does not know. This spurs agents to think about how these accounting numbers can be used as a means to maximize their interests (Ajina & Habib, 2017). This result is consistent with Zhang et al. (2008) and Tanusaputra and Eriandani (2021) that the use of aggressive earnings management is a moral hazard act where information asymmetry can cause top managers or majority shareholders to deceive others about the company's financial health. Cho et al. (2012) also show that the Z-score depends on the accounting numbers, so any changes in the accounting records can cause distortions in the Z-score.

The results of the Wald Test show that with the presence of AEM, the probability of a company being categorized as a healthy company is higher than being categorized as a company experiencing financial distress. With AEM, the probability of a company being categorized as a healthy company is higher than being categorized as a company experiencing financial distress. There is a tendency from the results of this study to show distortion of the Z-Score measurement model if it does not consider the AEM factor in the existing measurement model. This is in line with the research results of Utami et al. (2020) which propose that for the case of manufacturing companies in Indonesia, the adjustment of the Z-Score model by involving the AEM model can increase the accuracy of the Z-score model bankruptcy prediction by 5.5%. Serrano-Cinca et al. (2019) also state that indicators for detecting accounting anomalies should be considered when developing new models to predict bankruptcy. These results show that the AEM variable can improve the performance of the bankruptcy prediction model (du Jardin et al., 2019). However, different results were found by Manab et al. (2015) because the unadjusted model (a model that does not include earnings management factors in the financial figure to predict bankruptcy) can predict better than the adjusted model.

This study also provides empirical evidence that REM has a significant effect on the prediction of the company's financial distress. REM are management actions that deviate from normal business practices carried out with the main objective of achieving profit targets. Manipulation of real activities such as giving price discounts, decreasing discretionary expenses, and producing large quantities. Tabassum et al. (2015) also state that the opportunistic behavior of companies to manipulate company earning through real activities aims to show good performance in the current period. Of course, good performance at this time will correlate with the prediction of the company's financial condition which is reflected in the company's Z-score. However, the results of this study are different from those of Namazi et al. (2019) which shows that REM and the probability of bankruptcy have no significant effect.

The results of the Wald test also show that with REM, the probability of a company being categorized as a healthy company is higher than being categorized as a company experiencing financial distress. In other words, there is a tendency for companies to be reported with better financial conditions, indicating a distortion of the Z-Score measurement model if it does not consider the REM factor in the existing Z-score measurement model. In other words, including the REM factor in the Z-score measurement model will increase the prediction accuracy. Almamy et al. (2016) shows that REM when combined with the original Z-score variable is highly significant in predicting the health of UK firms. Lin et al. (2016) also show that including the indicator variable for REM greatly increases the explanatory power of the Z-score factors for firm survival/default. Li et al. (2021) also showed that REM was chosen as a predictor of a company's financial distress through the LASSO (Least Absolute Shrinkage and Selection Operator) variable selection technique.
Next, this study also provides empirical evidence that FC has a significant effect on the prediction of the company's financial distress. These results indicate that when family members occupy management positions and control the board, families are more likely to take personal benefits and take actions that benefit the family's controlling shareholders at the expense of shareholders’ interests. Management’s position as an agent encourages them to think about how these accounting numbers can be used as a means to maximize their interests (Ajina & Habib, 2017). The findings of Anderson and Reeb (2003) research also show that family firms have lower accounting practices than non-family firms because family firms are concentrated ownership which allows majority shareholders to dominate the board of directors, thereby exacerbating conflicts of interest between shareholders. Majority and minority.

The results of the Wald test also show that with the presence of FC, the probability of a company being categorized as a healthy company is higher than being categorized as a company in the grey area. There is a tendency for companies to be reported with better financial conditions, indicating a distortion of the Z-Score measurement model if it does not consider the FC factor in the existing Z-score measurement model. This result is in line with Byun et al. (2011) and Villalonga and Amit (2006), which show that the level of information asymmetry increases with the concentration of ownership, and the increase in information asymmetry occurs along with an increase in informed trading involving informed traders such as controlling shareholders and other parties who have connections with management.

Implications

This study has limitations because it is only considering the impact of the management's opportunistic behaviour on the Z-score prediction model. Future research could consider its impact on other predictive models that use financial statement data as a source of information, such as the Springate (S-score), Fulmer (H-score), Taffler (Z-Taffler), Grover (G-score), and Zmijewski (Z-Score) models.

This study is important for investors and creditors as an input to consider the factors of opportunistic behaviour of family management and control, in using the company's financial distress prediction model. Choosing the right financial distress prediction model is useful for managing their risk profile more effectively. For standard setters and capital market managers, the results of this study can be used as input for establishing corporate governance design rules to improve the quality of decision-making related to values or figures in financial statements. For further research, the results of this study can be used as a reference for formulating a company's financial distress measurement model by involving the three factors which in this study were empirically proven to affect the Z-Score value.

References


