The "Big Three" to Predict Financially Distressed Firms Before the Pandemic

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ABSTRACT

This research aims to foresee financial difficulties in the agricultural industry using three prominent variables: profitability, operating leverage, and liquidity insolvency, before the pandemic. The research employed the documentation technique as the main data collection method. The purposive sampling technique was conducted to obtain the distressed and non-distressed companies during the 2017-2019 period. Multiple discriminant analysis was employed as the data analysis method. Our study reveals that the "big three" factors of profitability, operating leverage, and liquidity insolvency are all capable of differentiating between businesses that are in financial crisis and those that are not. With a model accuracy of 85.700 percent, the "big three" factors can also serve as the determining variables in the discriminant function with profitability as the most influential variable.

Keyword: Multiple Discriminant Analysis; Financial Distress; Profitability; Operating Leverage; Liquidity Insolvency

"Tiga Serangkai" untuk Memprediksi Perusahaan dengan Kesulitan Keuangan Sebelum Masa Pandemi

ABSTRAK

Tujuan penelitian ini adalah untuk meramalkan kesulitan keuangan di industri pertanian dengan menggunakan tiga variabel utama: profitabilitas, leverage operasi, dan insolvensi likuiditas, sebelum pandemi. Penelitian ini menggunakan teknik dokumentasi sebagai metode pengumpulan data. Metode purposive sampling dilakukan untuk mendapatkan perusahaan yang mengalami kesulitan keuangan dan yang tidak mengalaminya selama periode 2017 hingga 2019. Metode analisis diskriminan digunakan sebagai metode analisis data. Hasil penelitian ini mengungkapkan bahwa tiga faktor utama, yaitu profitabilitas, leverage operasional, dan insolvensi likuiditas semuanya mampu membedakan antara bisnis yang sedang mengalami krisis keuangan dan yang tidak. Dengan tingkat akurasi model sebesan 85,700 persen, "tiga serangkai" faktor ini juga berfungsi sebagai tiga variabel yang mampu membentuk fungsi diskriminan dengan profitabilitas sebagai variable yang paling berpengaruh.

Kata Kunci: *Analisis Diskriminan; Kesulitan Keuangan; Profitabilitas; Leverage Operasional; Insolvensi Likuiditas*

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INTRODUCTION

The agriculture sector is important to the Indonesian economy (Kusumaningrum, 2019). When it comes to being the engine of national economic growth, agriculture has a strategic role to play (Dinarjto & Kusumaningtyas, 2020). These crucial elements are demonstrated by the creation of capital, the supply of food and industrial raw materials, the absorption of labor, and the contribution of sources of revenue and foreign cash for the nation (Rokhmana, 2015). Even on the Ministry of Agriculture's official website, it is stated that the agricultural industry contributed positively to the gross domestic product (GDP) between 2013 and 2018 in Indonesia. The agriculture industry is also included as one of the five largest contributors to real GDP in 2021, with a 14.27 percent contribution, according to a report released by the Central Statistics Agency (Figure 1). Due to the significant advantages for stakeholders, businesses, and the Indonesian economy, it is vital to showcase this research. This study is anticipated to deter agriculture sector company foreclosures from happening in the future, which might reduce the agricultural sector's GDP contribution.

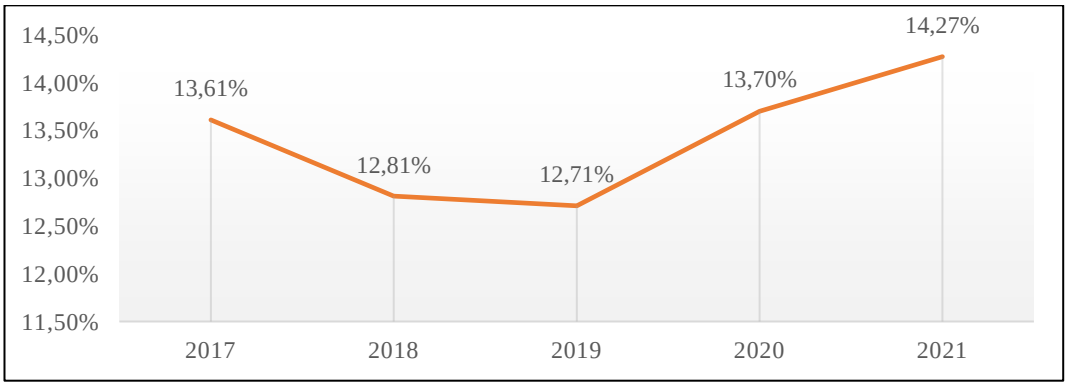

Figure 1. Contribution of the Agriculture Sector to the Real GDP of Indonesia
Source: Research Data, 2021

Based on Figure 1, to help investors examine their investment decision-making in Indonesian public firms operating in the agriculture sector, the company management must give the investors current and reliable information regarding the company's financial situation. The analysis of liquidity ratios (Rahman & Masngut, 2014), leverage ratio, profitability, and firm size (Hendra et al., 2018; Masdupi et al., 2018), good corporate governance (Merkusiwati, 2014), operating efficiency, profit margins, as well as cash flow from operating activities are amongst factors that have been mentioned in previous studies to help investors improve their investment decision (Fatmawati & Wahidahwati, 2017). In contrast to other studies, the Altman model was employed as the primary factor in our study to predict financial distress conditions amongst agriculture firms. The model was selected in light of its greater than 50% accuracy in forecasting future bankruptcy (Fauzan & Sutiono, 2017). This argument is consistent with Purwanti's (2016) study, which contrasts the Springate bankruptcy prediction model with the Altman in the Indonesian mining industry. Her study's findings demonstrate that the Altman Z-Score model, which considers the Market Value of Equity (MVE) component to gauge investor welfare, is significantly more accurate in predicting

a company's financial difficulty than Springate's model (Purwanti, 2016). However, inconsistent findings from past research have continually been uncovered. For instance, there is variability in the research findings regarding explanatory variables that are significant in predicting the occurrence of financial distress (Merkusiwati, 2014). The main reason for that variability is due to the unequal distribution of the research's sectors and variables (Permana et al., 2017). A discussion of studies that combines the *"big three"*: ***profitability, operating leverage, and liquidity insolvency***, to predict the financial distress condition of a firm is still infrequent in the Indonesian context. Therefore, further investigation is necessary in order to integrate the big three into a financial distress model to forecast the insolvency of agriculture firms in Indonesia.

A study by Salim (2018) finds that the profitability variable, with a coefficient of 2,309, has a significant effect on the discriminant mathematical model for manufacturing businesses listed on the Indonesia Stock Exchange for the years 2012 to 2016. The operating leverage variable has a predominant impact in forecasting bankruptcy, according to research findings by Hendra and Diah (2018). Their findings are consistent with the study by Priliyastuti and Stella (2017), which shows that the operating leverage value, with a coefficient value of 1.244, has a dominant influence in forecasting company insolvency. Hence, we may say that the most important factor in determining how the discriminant function is formed is operational leverage. Liquidity insolvency is an accurate model for forecasting the signs of financial distress, according to research conducted by Hadi and Anggraeni (2008) with a sample of firms delisted on the IDX. The findings of this study are further supported by the research by Primasari (2017), who found that the Springate model's prediction of liquidity insolvency had an accuracy rate of 32.3% when forecasting financial distress.

The purposes of this study are to determine (1) whether the variables profitability, operating leverage, and liquidity insolvency can distinguish between companies that are experiencing financial troubles and those that are not, and (2) whether profitability is the most influential factor in forming the discriminant function to predict financial difficulties. Given the fundamentals of going-concern accounting, which are governed by PSAK 1 and in which corporate entities hope to continue indeterminately in the future, this type of research is particularly challenging. This is because the topic of the financial crisis is quite enticing to debate (Ginting & Tarihoran, 2017). However, there is frequently an asymmetry between businesses and investors when it comes to comprehending the financial control of the firm (Wardani & Wahyuningtyas, 2018). This contradiction goes against the signaling hypothesis, which contends that to analyze investment decision-making, management should give investors recent and accurate information about the company's financial situation (Chen et al., 2017).

In a 1973 essay by Spence, the signaling theory was initially defined as a function of the impact of education on the employment market (Darmayanti et al., 2021). However, the most influential theory utilized to analyze corporate finance management nowadays is the signaling theory (Primasari, 2017). The goal of this approach is to lessen the knowledge imbalance that exists between businesses and investors. By communicating either positive or negative news through earnings management, signaling activities may exist (Primasari, 2017). The notion is

employed to demonstrate the firm's managerial skill in supplying the market with information. However, due to various factors and contextual distortions like press coverage or news, the provided signal is frequently received by the recipient in a different way (Darmayanti et al., 2021).

According to the signaling theory, management must provide readers of financial statements with signals of both good and negative news so that there is no disparity in the information they get about the company's status (Darmayanti et al., 2021). The profitability proxied by ROE can provide this indication as a preliminary indicator of the likelihood of financial distress (Anggraeni et al., 2021). The high ROE number indicates optimal business production (Priliyastuti & Stella, 2017). In other words, a low ROE ratio affects investor dissatisfaction with the company's investment prospects (Komarudin et al., 2019). How much of the company's assets are funded with money from a third fund may be determined by looking at the operating leverage estimated by the debt-to-assets ratio or DAR (Priliyastuti & Stella, 2017). If the DAR is low, investors will be likely to invest in the firm since the ratio implies strong corporate performance in preventing bankruptcy. The financial leverage proxied by the debt-to-equity ratio (DER) measures how much debt a firm has concerning its equity in its shares (Mutiarahim, 2019). This ratio may demonstrate the firm's capacity to pay back money lent to it by third parties (Priliyastuti & Stella, 2017). If the ratio displayed has a low value, the company's performance is improving. A high DER ratio, however, denotes the company's incapacity to pay its obligations. With a 32.3 percent accuracy record, the Springate model of liquidity insolvency may serve as an appropriate alarm to anticipate bankruptcy (Koto et al., 2018).

H_1: Profitability, operating leverage, and liquidity insolvency are able to positively discern between organizations that are in financial distress and those that are not.

Salim (2018) found that the profitability variable, with a coefficient of 2.309, has a significant effect on the discriminant mathematical model for manufacturing businesses listed on the Indonesia Stock Exchange for the years 2012 to 2016. The operating leverage variable has a predominant impact in forecasting bankruptcy, according to research done by Hendra and Diah (2018) with a sample of mining businesses listed on the IDX for the years 2014 to 2016. This result is consistent with the study by Priliyastuti and Stella (2017), which shows that the operating leverage value, with a coefficient value of 1.244, has a positive influence in forecasting company insolvency. Liquidity insolvency is an accurate variable for predicting a financial distress condition, according to research conducted by Hadi and Anggraeni (2008) with a sample of firms delisted on the IDX. The findings of this study are further explored by the research by Primasari (2017), who found that the liquidity insolvency factor had a low accuracy rate when forecasting financial distress. Hence, we may say that amongst three predictors: profitability, operating leverage, and liquidity insolvency, the most important factor to determine how the discriminant function is formed is profitability.

H_2: The most important element which influences, positively, the discriminant function is profitability.

RESEARCH METHOD

In this study, we employed quantitative research methods relying on the positivist paradigm, purposive sampling strategies for secondary data collection, and multiple discriminant analysis techniques for data analysis. The positivist paradigm used in this study is associated with a priori theory, which views research as a sequence of logical stages focused on causality or participant viewpoints to promote adequate results for further analysis (Batubara, 2017). The data collected is in the form of quantitative secondary data. With a sample of 15 agriculture sector businesses listed on the Indonesian capital market throughout the study period, the researchers examined annual financial report data for the years 2017 through 2019 from the Indonesia Stock Exchange website. In the meanwhile, the researcher employed the purposive sampling technique to obtain the sample by selecting a set of samples based on certain criteria (Nurfauzi & Firmansyah, 2018). The outcomes of the purposive sampling are as follows:

Table 1. Purposive Sampling Results

Criteria	Total
Agricultural sector companies listed on the Indonesia Stock Exchange	25
Firms Not Meeting First Criteria:	
Agricultural sector companies that publish annual financial reports for three consecutive years from 2017-2019	(8)
Firms Not Meeting Second Criteria:	
Agricultural sector companies that publish annual financial reports in rupiah for the period 2017-2019	(1)
Firms Not Meeting Third Criteria:	
Agricultural sector companies that publish annual financial reports with complete information from 2017 to 2019	(1)
Number of Samples Used in the Study	15
Research Period	3
Total Number of Research Samples	45

Source: Research Data, 2021

The dependent variable in this study is financial distress. This study's formula was the same as that utilized in Wardayani and Maksum's (2020) research. The cut-off score for Wardayani and Maksum's (2020) model is 0.267 meaning that if the firm's W-score is under 0.267, the firm will be labeled as a financially distressed company but if otherwise, the firm will be classified as a financially strong enterprise. We adopted Wardayani and Maksum's (2020) formula to determine the W-score in Equation 1 for measuring the firm's financial distress condition as follows.

$$W - Score = 0{,}717 * A + 0{,}847 * B + 3{,}107 * C + 0{,}420 * D + 0{,}998 * E \quad \text{.....(1)}$$

Note:

A is working capital to total assets, B is retained earnings to total assets, C is income before taxes and interest to total assets, D is the market value of equity to book value of debt, and E is sales to total assets.

Profitability serves as the study's primary explanatory variable. This variable is calculated by dividing net income by equity book value. This ratio was chosen because it can foretell when financial hardship will develop. This is supported by the study conducted by Wakhidah et al. (2014), which claims that the profitability value has a discriminant function coefficient value of 0.051 and

can identify financial distress. Operating leverage operates as the research's second independent variable. Total debt divided by total assets is used to compute this variable. This ratio may demonstrate the company's capacity to fulfill both short-term and long-term commitments (Priliyastuti & Stella, 2017). Liquidity insolvency functions as the third determining factor in this study. This variable was chosen because it has a 92.5 percent accuracy rate when assessing the default probability (Komarudin et al., 2019). The cut-off score for Koto et al's (2018) model as presented in Equation 2 is 0.862 so when a firm has a score under 0.862, the company will be identified as an entity with a liquidity problem. The research by Koto et al. (2018) is referenced in Equation 2 to quantify liquidity insolvency as follows.

$$K - Score = 1{,}03 * F + 3{,}07 * G + 0{,}66 * H + 0{,}4 * I \quad \text{.....(2)}$$

Notes:
F is the ratio of working capital to total assets, G is the profit before interest and taxes on total assets, H is the profit before tax to total current liabilities, and I is the ratio of sales to total assets.

Financial leverage serves as the control variable. The entire debt divided by the total book value of equity is used to calculate this variable. Financial leverage is a ratio that measures a company's capacity to service its debt in proportion to its total assets (Mutiarahim, 2019). This ratio was chosen because the discriminant function it forms has a coefficient value that may exceed 0.523, making it the dominating control variable (Wakhidah et al., 2014).

Discriminant analysis is a method of analysis that involves more than two variables at once (Pane et al., 2015). To determine the obvious differences between groups in the dependent and independent variables, the discriminant analysis should be implemented (Nabila, 2020), and hence, a categorical dependent variable, such as "financial distress" and "non-financial distress," is required as well (Masdupi et al., 2018). The discriminant function will demonstrate which independent variable is responsible for any differences between sets of the response variable (Nabila, 2020). Because the discriminant analysis model does not account for year variations in the sample group, the assumption made in this study—that there is a pooled discriminant function—means that it is irrelevant whether the data utilized are panel data (Pane et al., 2015). Consequently, the discriminant equation model applied in this research is formulated in Equation 3 as follows:

$$T - Score = b1 * X1 + b2 * X2 + b3 * X3 + b4 * C1 \quad \text{.....(3)}$$

Notes:
T-score is the threshold for financial distress discrimination across firms while b1, b2, and b3 are coefficient values of explanatory variables. X1 is profitability, X2 is operating leverage, and X3 is liquidity insolvency. Those Xs are explanatory variables of financial distress conditions in agricultural enterprises. C1 is the discriminant analysis model's control variable, which is financial leverage.

RESULTS AND DISCUSSION

To determine if there was a link between the research's predictors, the lack of multicollinearity among independent variables test should be carried out (Wakhidah et al., 2014). Due to the correlation between the independent variable,

the generated discriminant function's interpretation will be arbitrary. The results of the multicollinearity assumption test are displayed in Table 2. The variance inflation factor (VIF) value is below 10.000 and indeed the tolerance value is over 0.100 for all independent variables indicating that the multicollinearity assumption has been completely satisfied based on these data.

Table 2. Multicollinearity Test Results

Variables	Tolerance	VIF	Conclusion
Profitability	0.182	5.483	No Multicollinearity
Operating Leverage	0.221	4.533	No Multicollinearity
Liquidity Insolvency	0.225	4.435	No Multicollinearity
Financial Leverage	0.183	5.475	No Multicollinearity

Source: Research Data, 2021

The residual normality assumption test verifies that the residual data on the independent and dependent variables are distributed normally (Fatmawati & Wahidahwati, 2017). The purpose of this assumption test is to determine whether or not the data can accurately reflect the total population. The Pearson Omnibus test, the Shapiro-Wilks Lambda test, and the Kolmogorov-Smirnov test are three methods for testing the classical assumption of normality (Sari et al., 2017). The Kolmogorov-Smirnov test was employed in this study since it is more consistent with the data and the variety of populations that were used. The p-value, which may be found in Table 3, is 0.133. As a result, the normality assumption test is satisfied because the residual value of the test is greater than 0.050, failing to disprove the null hypothesis for the normality test and indicating that the residual data is distributed normally (Sari et al., 2017).

Table 3. Normality Test Results

Unstandardized Residual	
N	45
Mean	0.000
Std. Deviation	0.223
Asymp. Sig. (2-tailed)	0.133
Conclusion	Residual is Normally Distributed

Source: Research Data, 2021

The homogeneity assumption test was performed to see whether the independent variables' variance had distinct or the same values (Maffei et al., 2020). To find the outlier data, this test must be performed. If the P-value is higher than 0.050, the homogeneity test is passed. Table 4 shows that the P-value for each of the four research variables is higher than 0.050. Since there are no outliers in the data that may compromise the discriminant function's validity, the homogeneity test for our model is satisfied.

Table 4. Homogeneity Test Results

Variables	t	Sig.	Conclusion
Profitability	0.419	0.677	Homogenous
Operating Leverage	-1.518	0.137	Homogenous
Liquidity Insolvency	0.003	0.998	Homogenous
Financial Leverage	0.263	0.794	Homogenous

Source: Research Data, 2021

The test of equality of group means was performed to verify whether the findings of this study could discriminate between strained and non-distressed enterprises (Salim, 2018). There is no ability to differentiate between the group of financially distressed enterprises and the group of financially secure organizations, which is the null hypothesis that applies to this test (Salim, 2018; Wakhidah et al., 2014). The four variables are all thought to be able to discriminate between bankrupt and solvent enterprises since Table 5 shows that their significant values range from 0.050 to 0.100.

Table 5. The Results of the Test of Equality of Group Mean

Variables	Wilks' Lambda	F	Sig.	Conclusion
Profitability	0.924	3.521	0.067	Having Discriminant Ability
Operating Leverage	0.471	48.349	0.000	Having Discriminant Ability
Liquidity Insolvency	0.637	24.552	0.000	Having Discriminant Ability
Financial Leverage	0.778	12.257	0.001	Having Discriminant Ability

Source: Research Data, 2021

The stepwise analysis was used to develop the optimum theoretical formulation for the discriminant function (Wakhidah et al., 2014). The findings of the stepwise approach using the SPSS 25 software are shown in Table 6. According to the computation findings, the control variable, financial leverage, which is represented by the Debt to Equity Ratio value, cannot be included in the discriminant function since the SPSS 25 program estimates it would affect the discriminant model's goodness of fit. In other words, none of the best discriminant models in this study can include the aforementioned variable in their various combinations. Thus, operating leverage, liquidity insolvency, and profitability are the factors that may produce the best outcomes based on the stepwise analysis method offered by SPSS 25 (Table 6).

Table 6. Stepwise Method Results

Variables	Wilks' Lambda				Conclusion
	Statistic	df1	df2	Sig.	
Operating Leverage	48.353	1	43	0.000	Entered
Liquidity Insolvency	33.772	2	42	0.000	Entered
Profitability	37.788	3	41	0.000	Entered

Source: Research Data, 2021

To understand which factor has ***the most impact on creating a discriminant function***, this study utilized the table of standardized canonical discriminant function coefficients (Wakhidah et al., 2014). The output structure matrix table was then used to see which factors contributed most significantly to the discriminant model. The operating leverage, liquidity insolvency, and profitability variables are those that have a connection and make up the biggest portion of the discriminant equation, referring to Table 7. Therefore, the discriminant function equation subsequently incorporates the three variables.

Table 7. Standardized Canonical Discriminant Function Coefficient Results

	Canonical Function	Output Structure
Profitability	1.247	0.638
Operating Leverage	0.882	-0.454
Liquidity Insolvency	-1.436	-0.172

Source: Research Data, 2021

The following formula (Equation 4) is used to write the final discriminant function based on the coefficients of the canonical equation.

$T - Score = 1.247 * PROFIT + 0.882 * LEVERAGE - 1.436 * INSOLVENCY$ .....(3)

Notes:

T-score is the threshold for financial distress discrimination across agriculture firms. PROFIT is profitability, LEVERAGE is operating leverage, and INSOLVENCY is liquidity insolvency.

With standardized coefficient values of 1.247 and 0.882, the discriminant model concludes that the factors relating to profitability and operating leverage will significantly increase the likelihood of financial hardship. All agriculture sector enterprises experience financial distress before the pandemic, which is significantly impacted by the liquidity insolvency variable. This insolvency factor has a -1.436 coefficient value. As a result, the overall T-Score is 0.693 if all three metrics are assumed to have a value of 1.000 per variable. These metrics include profitability, operating leverage, and insolvency. The researchers must determine the cut-off point value before they can determine whether an organization with a T-Score of 0.693 is categorized as a company in financial trouble or not.

The cut-off point is established using the outcomes of functions at group centroids, which separate enterprises that are insolvent and those that are not (Wakhidah et al., 2014). The cut-off point for businesses with the notation "0" of the non-financial distress category, according to Table 10, is -2,858 with 11 firms that are not insolvent. As 34 corporations file for financial difficulties with the code of "1", the cut-off value for organizations in financial hardships is 0.925. The following formula (Equation 5) is used to compute the cut-off score by following Salim's (2018) model.

$T\ Cut\ off = \frac{(Na*Zb)+(Nb*Zb)}{(Na+Nb)}$ .....(5)

Notes:

Na is the total number of agricultural firms which are categorized as non-financially distressed firms, Nb is the total agriculture firms that are categorized as financially distressed firms, Za is the average W scores of non-financially distressed firms, which are calculated using Equation 1, Zb is the average W scores of financially distressed firms, which are calculated using the same equation as Za.

The results of the T cut-off calculation are explained as follows. By entering the values of Na (11.000), Za (-2.858), Nb (34.000), and Zb (0.925), we can generate the T cut-off value of 0.00027. The interpretation of the T cut-off score is that a firm in the agriculture industry is categorized as being in a distress condition if its T score falls below 0.00027. The firm is classified as a non-distressed corporation, on the other hand, if the T-Score is greater than 0.00027. Additionally, validation tests were run to see whether the discriminant functions' classification accuracy was valid. According to the classification findings, the computation of the cut-off point in 1 firm, which was first classed as a non-financial distress company, has been incorrectly classified as a distressed company. A type I mistake in 2019 at the PT Mahkota Group organization led to misclassification. Since no firm that was previously insolvent later became a healthy corporation, there was no misclassification for the type II error.

Table 8. Functions at Group Centroids Results

Description	Function	Cases Used In Analysis
Non-Financial Distress (0)	-2.858	11
Financial Distress (1)	0.925	34
N		45

Source: Research Data, 2021

Considering that the discriminant function has several denominator variables, ***the "Eigenvalues" accuracy test*** was performed to assess the statistical significance of the discriminant model using a multivariate test of significance (Salim, 2018). The canonical correlation value of 0.857, or CR2 of 0.734 when squared, is shown in Table 9. According to the results of canonical correlation, the three denominator factors (profitability, operating leverage, and liquidity insolvency) can accurately explain 85.700 percent of the difference between categories of enterprises in difficulty and those that are not. The relevance of each variable was assessed using a test to evaluate the precision of "Wilk's Lambda" discriminant function. Since Table 9 shows that the p-value (0.000) is less than 0.050, it can be inferred that the statistically significant difference between the categories of distress and non-distress can be attributed to the discriminant average of the two variables. This finding signifies that the newly created discriminant function will be able to identify whether a company is in a financial crisis or not. However, with an accuracy result of 85.700 percent, the mathematical model developed is highly accurate in forecasting financial ruin.

Table 9. The Accuracy Test Results

Eigenvalue	Canonical Correlation	CR^2	Wilks' Lambda	Sig.
2.765	0.857	0.734	0.266	0.000

Source: Research Data, 2021

Calculating Cpro and Cmax as well as Press Q'Statistic was undertaken to measure ***the model's validity*** in the discriminant analysis (Salim, 2018; Wakhidah et al., 2014). The Cpro and Cmax calculation is described in Equation 6 as follows.

$$Cpro = [\,p^2 + (1-p)^2]x\ 100\% \quad \text{.....(6)}$$

$$Cmax = (n_{max}/N)\ x\ 100\% \quad \text{.....(7)}$$

Notes:

Cpro is the possibility of attaining accuracy in the grouping of samples. p is the probability of a firm being categorized as a financially distressed firm. Cmax is a measurement of validity based on the largest number of samples. nmax is the largest number of samples. N is the total firms in the samples.

We used Equation 6 to compute the values of Cpro and Cmax and then compared these values with the canonical correlation score in Table 9 as follows.

Cpro = $[(34/45)^2 + (1-(34/45))^2]$ x100%
= 75.502%

Cmax = (n_{max}/N) x 100%
= (34/45) x 100%
= 75. 555%

According to these estimates, the Cpro value is 75.502 percent, the Cmax value is 75.555 percent, and the hit ratio value or the accuracy result is 85.700 percent. When the Cmax score is compared to the hit ratio value, we can assess that the hit ratio value is higher than the Cmax score (85.700 percent > 75.555

percent). In other words, since the hit ratio value is already bigger than the Cmax score, it may be stated that the sample grouping in this study is undeniably accurate (Salim, 2018). The Press Q Statistics validity test is a straightforward computation that involves dividing the number of suitable classifications by the sample (Wakhidah et al., 2014). Press Q Statistic computation, from SPSS 25, produced a value of 41.089. We then transformed the press Q score into the T-value resulting in the T-value of 3.841. If we compared the t-value with the minimum threshold of the T-statistic of 1.96, we may conclude that the hit ratio value of 85.700 percent is significant at 0.050 because the T-value is higher than the minimum threshold (3.841 > 1.96). Based on the results of the Cpro, Cmax, and Press Q statistics, our discriminant function in Equation 4 has a fairly stable and accurate value.

A test of equality of group means can be used to determine if the variables are capable of identifying insolvent organizations or not. Only operating leverage and liquidity insolvency of the three primary explanatory factors have a P-value (0.000) below 0.050, according to the results in Table 5, whereas the liquidity insolvency variable has a P-value (0.067) greater than 0.050 but below 0.100. Because all of the major indicators can tell which agriculture sector enterprises are having financial issues and which are not between the period 2017 to 2019, it may be determined that there is enough evidence to accept the first hypothesis. The test findings of the standardized canonical discriminant function coefficients, which are shown in Table 10, can be used to verify the second hypothesis. According to the test's findings, the discriminant function is formed by three variables that have absolute values greater than zero: profitability, operating leverage, and liquidity insolvency. These three variables are substantially associated while creating the discriminant model. Profitability, however, has the most positive influence among the three predictors since, as shown in Table 10, its standardized coefficient value is above zero and has the highest value of 1.247. This finding supports the second hypothesis of our study.

Table 10. Hypotheses Test Results

Variable	Sig.	Function
Profitability	0.067	1.247
Operating Leverage	0.000	0.882
Liquidity Insolvency	0.000	-1.436
Conclusion	H_1 is Accepted	H_2 is Accepted

Source: Research Data, 2021

Profitability, operating leverage, and liquidity insolvency, the three primary independent factors, are able to distinguish between organizations in financial crisis and those that are not. According to studies by Anggraeni et al. (2021) and Komarudin et al. (2019), a high profitability ratio denotes ideal business output. On the other hand, the findings of Priliyastuti and Stella's research (2017), which show that operating leverage may be used to estimate how much of a company's assets are supported with money from a third fund, are also strengthened by our research. Investors are more willing to invest in a company if its operating leverage is low since the ratio suggests that the company has performed well in averting trouble. Our research supports Koto et al. (2018), who find that liquidity insolvency may also be a reliable warning sign of impending

financial problems. Our findings also contribute to helping investors assess the possibility of future corporate defaults in agricultural industries which may harm their investments. The agriculture field has a strategic role to play when it comes to being the driver of a nation's socio-economic development (Dinarjto & Kusumaningtyas, 2020). The generation of capital, the provision of food and industrial raw materials, the uptake of labor, and the contribution of income sources and foreign currency for the country serve as examples of these key components (Rokhmana, 2015). We may therefore draw the conclusion that this study supports the signaling theory's claim that management must inform readers of financial statements of both positive and negative news to ensure that the information they receive about the company's situation is commensurate (Darmayanti et al., 2021). Signaling theory implementation can be carried out by informing the public of either good or bad news through earnings management (Primasari, 2017). The idea is used to illustrate how well the company manages to provide the market with appropriate information.

To shape the discriminant function, our classifiers model produces significant values for the three key variables of profitability, operating leverage, and liquidity insolvency with profitability as the most influential variable. Our results concur with Salim's (2018) study, which discovered that the profitability variable significantly affects the discriminant model for industrial companies listed on the Indonesia Stock Exchange from 2012 to 2016. Additionally, we discover that operating leverage and liquidity insolvency ranked second and third in the discriminant analysis model of Indonesian agriculture sector enterprises before the pandemic. The findings of Priliyastuti and Stella's research (2017), which explain that the operating leverage value has a dominant influence in predicting company insolvency, and those of Hadi and Anggraeni's research (2008), which showed that the prediction of liquidity insolvency model has an accuracy rate of more than 20% when forecasting financial distress, are also consistent with our results. Depending on the coefficient value, each variable in our discriminant model has a different effect. For instance, the profitability and operating leverage variables have standardized coefficient values of 1.247 and 0.882, respectively, indicating a favorable influence from the discriminant equation. In contrast to the coefficient of liquidity insolvency, which has a value of -1.436, the two coefficients have distinct values. This unfavorable outcome results from the liquidity insolvency model's components of earnings before interest, tax to total assets, and sales to total assets, all of which tend to rise if a company uses its assets to their fullest potential in generating income and thereby lower the risk of financial distress. Therefore, this study enhances the rationale for applying the signaling theory in the research sector, which is purported to minimize the information gap between firms and investors (Darmayanti et al., 2021). Management must provide investors with up-to-date, trustworthy information on the company's financial situation to assist them in reviewing their investment decision-making.

CONCLUSION

Our research aims to ascertain whether the variables profitability, operating leverage, and liquidity insolvency can make a distinction between corporates that are currently facing financial difficulties and those that are not, as well as whether

the three variables can operate as a discriminant function in predicting financial hardships. A corporation in the agriculture industry that was listed on the Indonesia Stock Exchange for three years, from 2017 to 2017, is the research subject examined. The discriminant analysis approach was used in this work to create the ideal discriminant model to achieve all of the study's goals. To forecast the financial distress situation of Indonesian agriculture sector enterprises, this study finds that all predictors are significant and have a strong influence on the discriminant function. If the T-score produced by the discriminant analysis model is less than the threshold value of 0.00027, the company might be in financial trouble. On the other hand, if the T-score is higher than the cut-off level, the company is in sound financial standing.

Our study adds value by helping management and investors evaluate the sustainability of Indonesian agricultural sector enterprises using the discriminant model that we developed. The notion supporting the signaling theory is strengthened by our research findings. However, the limitation of our study is that it uses discriminant analysis techniques assuming that all data are pooled for a single time. Future research employing a logistic regression approach which makes use of panel data is encouraged in order to estimate the potential sustainability of corporate performance in other sectors, such as the banking industry. Additionally, future investigation may emphasize the need for a comparison study examining the financial situation both before and after the Covid-19 pandemic period.

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