Financial Indicator Analysis on Companies Inside The Watchboard List of Indonesia Stock Exchange

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Abstract

In June 2023, Indonesia Stock Exchange (IDX) announced the watchboard list, comprised of underperforming companies struggling to meet financial requirements. As of September 11, 2024, this list includes 223 companies. This research studied the financial indicators that may influence whether a company will be put in IDX watchboard list and attempted to generate a model to predict whether a company will be placed inside IDX watchboard list in the next two years. The sample data used are the financial indicators of companies on the IDX watchboard list for the year 2022 and 2023. The sample data also includes companies outside the IDX watchboard list, random sampled so that the amount of data of companies inside the IDX watchboard list is the same with the amount of data of companies inside the IDX watchboard list. The finding suggests all these financial indicators have influence: WOTA (working capital divided by total asset), RETA (retained earnings divided by total asset), EBTTA (earnings before taxes divided by total asset), PBV (market value of equity divided by book value of equity) and STA (total sales divided by total asset). Investors may use the prediction models generated in this research in deciding which stocks to buy. This research generated a MDA based prediction model and a logistic regression based prediction model that may predict whether a company will be place inside IDX watchboard list in the coming two years. The logistic regression-based prediction model shows better results than the MDA based one.

Keywords

IDX watchboard list, financial indicators, MDA, logistic regression

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Introduction

Based on Law No. 8 of 1995, the capital market is an activity related to public offerings and trading of securities, public companies related to the securities they issue, and institutions and professions related to securities. What is meant by securities are securities, namely debt acknowledgment letters, commercial securities, shares, bonds, evidence of debt. The capital market has a strategic role as one of the sources of financing for the business world and an investment vehicle for the community. In June 2023, Indonesia Stock Exchange (IDX) announced the watchboard list, comprised of underperforming companies struggling to meet financial requirements. Reviews are carried out of companies on the list to see if they meet the minimum continuing criteria, and those that don't may be suspended (www.idx.co.id).

With the implementation of the Watchlist Board, IDX aims to provide special segmentation for companies that's financially struggling, in accordance with investors' investment strategies and increase share liquidity. Understanding the financial health of companies in the watchboard list is crucial for both investors and regulatory bodies, as it can guide investment decisions and regulatory actions aimed at maintaining market integrity (Verbeek, 2012).

Listened companies that are included on the monitoring board are companies whose financial performance is problematic, and with open information, the public and investors should also be able to detect problems in these companies. However, while the presence of IDX watchboard list was publicly announced along with its support data, its impact on investors' investment policy is questionable. In fact, investors are still interested in stocks of some companies on IDX watchboard list. As shown in the following table, these stocks still managed to gain relatively high transaction volume and value.

Table 1 takes samples from five listed companies that are included in the IDX Monitoring Board as of March 24, 2024. Although these five companies are problematic companies that are included in the monitoring board. Market interest in these companies is quite large in 2023. The transaction volume reaches tens of millions and even hundreds of millions of transactions per year. The transaction value is also quite large, such as TAXI which recorded a transaction value of 3.9 billion rupiah, or ZATA with a transaction value of 5.1 billion rupiah throughout 2023. Companies that the IDX deems capable of improving their performance will be removed from this monitoring board, as regulated in IDX regulation number I-X regarding the placement of equity securities listings on a special monitoring board.

This study aims to highlight the impact of financial indicators on the inclusion of a listed company on the IDX Watchboard List. The aim is to understand key financial weaknesses that lead to these companies being placed on the watchboard, using indicators. Companies on this list are nor performing well, so that it's reasonable to use financial indicators that are suitable for financial distress (Widagdo & Sa'diyah, 2022).

This study also aims to develop a prediction model based on multiple discriminant analysis (MDA) and another based on logistic regression. Therefore, this study generated two different prediction models. Both models should be able to predict whether a listed company will be put to the IDX Watchboard List within the next two years due to poor performance. By comparing these models, this study may conclude which model yields better prediction.

Table 1.
Transaction volume and values at the year 2023 for some companies on IDX Watchboard List

Stock Code	Company Name	Transaction Volume	Transaction Value (in IDR)
BLTA	Berlian Laju Tanker Tbk	28.475.800	1.423.790.000
HADE	PT Himalaya Energi Perkasa Tbk	316.325.800	1.599.806.100
LAPD	Leyand International Tbk	74.215.800	476.928.700
TAXI	PT Express Transindo Utama Tbk	79.380.300	3.969.015.000
ZATA	PT Bersama Zatta Jaya Tbk	69.915.300	5.117.738.600

Source: processed from Indonesia Stock Exchange and investing.com

Literature Study

Pasar Modal

The capital market is a place where various parties, especially companies, sell stocks and bonds with the aim that the proceeds from the sale will later be used as additional funds or to strengthen the company's capital. A country's capital market can be used as one measure of the progress or decline of business dynamics that occur in that country (Fahmi, 2020). The capital market is defined as the trading of long-term financial instruments (securities), either in the form of equity (stocks) or debt (bonds), issued by both the government and private companies Untung (2011).

This capital market trades daily necessities. What is meant by public offering is the activity of offering securities carried out by issuers to sell securities to the public based on the procedures stipulated in this law and its implementing regulations. While securities are securities, namely debt acknowledgment letters, commercial securities, stocks, bonds, evidence of debt, collective investment contract Participation Units, futures contracts on securities, and any derivatives of securities (Balfas, 2012).

Issuers are parties or companies that issue securities in the form of shares or bonds and are offered to the public. After the public offering is carried out, the securities issued by the issuer will be traded on the stock exchange. In this study, the focus is only on discussing shares. Shares are the most commonly known and traded instruments in the capital market (exchange). Shares are participation, namely capital injection from shareholders into a business entity in the form of a limited liability company (Balfas, 2012).

Due to its novelty, only a few studies have been published on the topic of IDX Watchboard List. (Anastasia & Riza, 2024) examined the accuracy level of the Altman, Grover, Zmijewski and Springate financial distress production models to IDX Watchboard List. They found that Zmijewski is the most accurate model, followed by Altman, Grover and Springate. (Mulyana, et. al., 2023) studied on auditor opionion, to determine whether IDX Watchboard List is affected by business risk or internal control. They concluded that leverage and mass media coverage have a positive effect on going concern audit opinion.

Signaling Theory

Signaling theory began with a probabilistic model developed by Michael Spence to model the labor market. After that, in various studies, this signaling theory approach was also widely used in various other fields, including the capital market. Signaling theory can describe behavior when two parties, namely individuals or organizations, have access to different information. One party, namely the sender, determines whether the information will be communicated or kept secret. Moreover, the information is communicated, the sender does it in the form of a signal. The other party, called the receiver, receives the signal and interprets it. The signal sent can represent the quality of the company. Only companies with high quality are able to pay debts and dividends in the long term. Meanwhile, companies with low quality will have difficulty paying their debts and dividends (Spence, 1973).

Indonesia Stock Exchange Monitoring Board

The Indonesia Stock Exchange is a self-regulatory organization, a company that has the authority to regulate itself. Specifically, the Indonesia Stock Exchange has the authority to regulate members or other parties related to the exchange, either because they are members of the exchange or because their securities are listed and traded on the exchange. The authority of the exchange to carry out this regulation is based on the obligation imposed by the Capital Market Law, Article 7, on the exchange to achieve its objectives, namely, to organize orderly, fair and efficient trading (Balfas, 2012).

The stock exchange is an institution that is given the authority to regulate the implementation of its activities. Therefore, the provisions issued by the stock exchange have a binding force that must be obeyed by members of the stock exchange, issuers whose securities are listed on the stock exchange, clearing and guarantee institutions, storage and settlement institutions, custodians or other parties who have a contractual working relationship with the stock exchange. The stock exchange in Indonesia is managed by PT Bursa Efek Indonesia (BEI), which was specifically established for this purpose. BEI is a merger of PT Bursa Efek Jakarta (BEJ) and PT Bursa Efek Surabaya (BES), which merged on November 30, 2007. As stated in article 6 of the capital market law, the activities of the stock exchange are basically to organize and provide a system or means of trading securities for its members (Balfas, 2012).

Among the objectives and laws of the capital market is to ensure the implementation of orderly, fair and efficient capital market activities and to protect the interests of investors and the public. Investor protection is one of the most important pillars, because if investors do not receive adequate protection, then they, especially small investors, are reluctant to make transactions on the stock exchange. Without a sufficient number of investors, market activities will be sluggish, and the function of the capital market will not develop (Untung 2011).

Logistic Regression

Recent studies use logistic regression as classification tool or estimation tool. For example, (Abimanyu et. al, 2023) developed a logistic regression based early warning system to estimate possibility of financial crisis in Indonesia. The resulting model has detected that Indonesia will enter a financial crisis in the afterwards 12-24 months. However, this can be mitigated because Indonesia has implemented most pre-emptive policies.

Likewise (Duasa & Zainal, 2020) used logistic regression in their study on probability of paying zakat from micro financing project returns for customers living in Kelantan and Perak. Results from logistic regression indicate that the probability of paying zakat among respondents is determined significantly by small household size, higher education level, lower per capita income and those respondents living in Perak. A study of (Siswanto et. al., 2019) used a logistic regression analysis to examine the critical factors that determine the probability of credit approval to Micro, Small, and Medium Enterprises (MSME).

(Adiba & Amir, 2023) studied whether religious affiliation and knowledge of halal regulations might predict or affect MSME interest in halal certification, which was quantitative research with data collected from 147 respondents and processed using logistic regression. The result showed that religiosity and halal literacy have no effect on the interest of MSMEs to register for halal certification. (Rahayu, 2013) used logistic regression to estimate investment decision model. The result shown that Their debt ratio, cash flow and exchange rate expectations have positive influence on the investment decisions, while the alternative investments and inflation expectations are not statistically significant (Hapsoro & Hartomo, 2016).

There also several fraud-related researches that used logistic regression alongside fraud pentagon theory. Fraud is a deliberate act by one or several people in management, employees or third parties (Tuanakotta, 2013). According to (Howarth, 2010), Fraud Pentagon theory is a fraud model that consists of five elements, which are pressure, opportunity, rationalization, competence, arrogance.

A study by (Triyanto, 2020) aims to analyze the implementation of fraud pentagon theory, covering pressure, opportunity, rationalization, competence, and arrogance variables on financial statement fraud using the Beneish M-score method for socially responsible companies listed in the SRI-KEHATI index of the Indonesia Stock Exchange in the period 2013-2018. Another study by (Surepno et. al., 2021) that focused on implementing fraud pentagon model at Jakarta Islamic Index. The result showed that pressure, opportunity, rationalization, competence (competency /ability) have significant effect on the occurrence of fraudulent financial reporting.

The result also showed that arrogance does not have significant effect. (Sasongko & Wijayantika, 2019) studied fraud risk factors on the implementation of fraudulent financial reporting, based on crown's fraud pentagon theory on manufacturing company listed on the Indonesia Stock Exchange (BEI) for the period 2014-2016. The results showed that the change of directors affected Fraudulent Financial Reporting, while financial stability, financial targets, external pressure, nature of industry, auditor turnover, frequent member of CEO picture, CEO duality had no effect on Fraudulent Financial Reporting.

(Koharudin & Januarti, 2021) studied factors affecting fraudulent financial reporting based on fraud pentagon theory elements including pressure (financial stability, financial target, external pressure), opportunity (the independent board of commissioners), rationalization (change in auditor), competence (director change), arrogance (frequent number of directors' display picture in the annual report). The results showed that financial stability and auditor change effects on fraudulent financial reporting. Results also show that financial targets, external pressure, independent board of commissioners, directors change, and a frequent number of directors display pictures in an annual report does not affect the fraudulent financial reporting.

The study of (Nugroho & Handayani, 2022) aimed to obtain empirical evidence about detection of the financial statement fraud accordance with the fraud diamond theory perspective that developed by (Wolfe & Hermanson, 2004). The results of this study showed that variables such as pressure (proxied by leverage ratio) could be used to predict the financial statement fraud. Opportunity (proxied by asset composition ratio) could be used to predict the fraud of financial statement. Then, rationalization (proxied by audit quality) could be used to predict the financial statement fraud (Nata, et. al., 2022).

Multiple Discriminant Analysis (MDA)
Other studies use multiple discriminant analysis (MDA) instead of logistic regression. (Nada, 2015) studied the level of Indonesia Islamic commercial bank's health using CAMELS method mentioned in PBI No.9/1/PBI/2007 and SEBI No 9/24/DPbS/2007 and using multiple discriminant analysis (MDA) Altman Z-score method. There are only four of six factors that are used in CAMELS: capital, asset, earnings and liquidity excluding management and sensitivity of market risk factor. The variables of capital factors are KPMM and ECR ratio. Asset factors consist of KAP and NPF ratio. The earning factor contains four financial ratios, which are NOM, ROA, ROE and REO. The result of the study showed that Bank Muamalat, Bank Syariah Mandiri and Bank Mega Syariah as moderately healthy banks.

There are also studies that use both multiple discriminant analysis (MDA) and logistic regression, so that comparison can be made about the accuration of these methods. (Rivanda & Muslim, 2021) studied to identify the variables used in financial distress prediction dominantly and to identify the best accuration and classification from the financial distress prediction models on the objects, i.e. 15 textile and garment companies listed in Indonesia Stock Exchange since 2010 to 2018, The variables used financial ratios indicators from the aspects of the operation capacity, liquidity, profitability, solvency, asset management capacity and growth capacity. The results of the study suggest that the model based on a logistic regression outperforms the classification accuracy of the multiple discriminant analysis. The variables used financial ratios indicators from the aspects of the price to book value, stock price, firm cycle, current ratio, ROA and Exchange rate. This study also showed that logistic regression outperforms multiple discriminant analysis, i.e. the

classification accuracy of logistic regression is 85.92%, while the classification accuracy of multiple discriminant analysis was 83.70%. (Adipati, 2017) studied financial ratios that can be used as a component in the Internal Credit Rating System (ICRS) to measure the level of risk of default. Multiple Discriminant Analysis (MDA) and logistic regression methods are involved in its computation. This study also shows that logistic regression outperforms multiple discriminant analysis, i.e. the classification accuracy of logistic regression is 89.29%, while the classification accuracy of multiple discriminant analysis was 80.40%.

Some other studies focused on financial distress, something that allegedly happened to companies listed in Indonesia watchlist board. (Hermuningsih et. al., 2022) studied This research aims to examine how leverage and equity affect firm value and financial distress as mediating factor in listed manufacturing firms on the Indonesia Stock Exchange. The results demonstrate that leverage affects financial distress, and profitability negatively impacts financial distress. Leverage and financial distress negatively affect both firm value and financial distress, acting as a mediating factor (Ross, et. all, 2018). Conversely, profitability positively affects both firm value and financial distress, functioning as a mediating factor. (Fachrudin, 2020) studied correlations within the prediction results of Altman, Springate, Zmijewski, Grover, and Khaira financial distress prediction models applied in manufacture companies listed in the Indonesian Stock Exchange. The results show that models which have a strong and significant relationship at alpha 5% are models from Altman - Springate, Altman - Khaira, Springate - Khaira, and Zmijewski - Khaira. The Grover model which does not have the predictor in the form of leverage, however, has a weak correlation with other models as well as the actual condition.

Hypothesis
H1: WOTA (working capital/total asset) impacts the presence of company
The working capital/total assets ratio is a measure of the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered (Altman & Hotchkiss, 2006). Working capital represents a company's ability to cover its short-term obligations and operational need.

H2: RETA (retained earnings/total asset) impacts the presence of company

Retained earnings (RE) are the total amount of reinvested earnings and/or losses of a firm over its entire life. This is a measure of cumulative profitability over the life of the company. The age of a firm is implicitly considered in this ratio. It is likely that a bias would be created by a substantial reorganization or stock dividend, and appropriate readjustments should, in the event of this happening, be made to the accounts. In addition, this ratio measures the leverage of a firm. Those firms with high retained earnings relative to total assets have financed their assets through retention of profits and have not utilized as much debt. This ratio highlights the use of either internally generated funds for growth (low-risk capital) or other people's money (higher-risk capital) (Altman & Hotchkiss, 2006).

H3: EBTTA (earnings before tax/total asset) impacts the presence of company

The variable used by (Altman & Hotchkiss, 2006) was actually EBITTA (earnings before tax/total asset). This is a measure of the productivity of the firm's assets, independent of any tax or leverage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with credit risk. According to some findings, this profitability measure, despite its reliance on earnings, which are subject to manipulation, consistently is at least as predictive as cash flow measures (Altman & Hotchkiss, 2006).

In this study the variable EBTTA (earnings before tax/total asset) is used as an approximation to EBITTA. This is due to the ease of extracting EBTTA accurately from financial reports. Positive EBTTA represents the ability of a company to utilize its assets in order to generate earnings, while negative EBTTA represents the amount of loss of the company divided by total asset.

H4: PBV (price to book value ratio) impacts the presence of company

Price to book value ratio is the market value of a firm divided by the book value it. Of the five variables employed in this hypothesis, price to book value ratio is the only variable that involves trading data in its computation. Therefore, this variable may be used to measure market awareness to the presence of IDX watchboard list.

H5: STA (sales/total asset) impacts the presence of company

The capital turnover ratio is a standard financial ratio illustrating the sales-generating ability of the firm's assets. This ratio is unique because on a univariate statistical significance test basis it would not be selected at all (Altman & Hotchkiss, 2006). Sales per total asset represent the ability of a company to utilize its assets in order to generate earnings.

MDA Based Prediction Model

Discrimination analysis involves deriving a discriminant variate, which is the linear combination of the independent variables that will discriminate best between the objects in the groups defined a priori. Discrimination is achieved by calculating the variate's weights for each independent variable to maximize the differences in the discriminant scores between the groups. The variation for a discriminant analysis, also known as the discriminant function. The discriminant score, also known as the discriminant Z score or Z score, is a summation of the values obtained by multiplying each independent variable by its discriminant weight (Hair et. al. 2019). The Z-score formula for this study is shown below:

$$Z = a + C1.WOTA + C2.RETA + c3.EBTTA + c4.PBV + c5.STA$$

where:
   Z: the discriminant Z score.
   a: constant value.
   C1, C2, C3, C4, C5: coefficients.

One must not confused Multiple Discriminant Analysis (MDA) with Altman financial distress Z-score formula. MDA is a statistical classification method that classifies observations into groups or categories. Altman used MDA in his study of financial distress, and all his famous versions of Z-score formula all outputs of MDA processes. But it's clear that Altman formula dan multiple discriminant analysis (MDA) are two different things.

Logistic Regression Based Prediction Model

The nonlinear nature of the logistic transformation requires that another procedure, the maximum likelihood procedure, be used in an iterative manner to find the most likely estimates for the coefficients (Nur, 2019). Instead of minimizing the

squared deviations (least squares), logistic regression maximizes the likelihood that an event will occur. The likelihood value, instead of the sum of squares, is then used when calculating a measure of overall model fit. The estimated coefficients for the independent variables are estimated using the logit value as the dependent measure to ensure that any predicted value (i.e., any logit value) can be transformed back to a probability that falls within zero and one. the coefficients estimated in this model formulation relate to impacts on a logged odds value (Hair et. al. 2019). For this particular study, our model formulation is:

$$\text{Logit} = \ln\left(\frac{ProbEvent}{1-ProbEvent}\right) = a + C1.\text{WOTA} + C2.\text{RETA} + c3.\text{EBTTA} + c4.\text{PBV} + c5.\text{STA}$$

where:
Logit: the logit value.
ProbEvent: probability of the event (the company goes into IDX watchlist board).
a: constant value
C1, C2, C3, C4, C5: coefficients.

The research framework in this study is divided into five panels, namely:
Panel 1, all stocks included in the Indonesia Stock Exchange monitoring board.
Panel 2, stocks included in category 1 of the Indonesia Stock Exchange monitoring board, namely low stock prices.
Panel 3, stocks included in category 7 of the Indonesia Stock Exchange monitoring board, namely low transaction volume.
Panel 4, stocks included in category 6 of the Indonesia Stock Exchange monitoring board, namely low proportion of public ownership.
Panel 5, stocks included in category 5 of the Indonesia Stock Exchange monitoring board, namely negative equity.

The research framework for analysis in this study can be seen in Figure 1.

Methodology of Research

Object of Research

The objects in this study are data from WOTA (Working Capital divided by Total Assets), RETA (Retained Earnings divided by Total Assets), EBTTA (Earnings Before Interests & Taxes divided by Total Assets), PBV (Price to Book Value Ratio), and STA (Sales divided by Total Assets) calculated from the annual reports of companies listed on the Indonesia Stock Exchange monitoring board as of September 11, 2024. For PBV, the computation involves annual reports and capital market transaction data from companies listed on the Indonesia Stock Exchange monitoring board as of September 11, 2024.

Design Research

The method used in this research is an associative research method, namely research that aims to determine the relationship between two or more variables. The research conducted was directed by a quantitative data approach, because this research used financial data issued by each company and transactions on the Indonesia Stock Exchange (IDX). Quantitative data is data in the form of numbers, for example stock prices, profitability, assets and debts (Jaya 2021).

Population and Sampel

Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics that are determined by researchers to be studied and then conclusions drawn (Syaban & Elly, 2021). The population in this study are companies listed on the Indonesia Stock Exchange monitoring board as of March 24, 2024.

A sample is a part of the number and characteristics possessed by a population. Sampling is the process of selecting a portion of a population element that is statistically sufficient in number, so that by studying the sample and understanding its characteristics, information about the state of the population will be known (Syaban & Elly, 2021).

This study uses secondary data in the form of financial reports for 2022 and 2023 from companies included in the special monitoring board of the Indonesia Stock Exchange and companies that are comparative data. This study also uses transaction data on the Indonesia Stock Exchange for 2022 and 2023.

Operationalizes Variable

The dependent variable is a bound variable that is influenced by the presence of an independent variable. There is one dependent variable for each panel of this study. For the dependent variables in this study are Panel1, Panel2, Panel3, Panel4, and Panel5. Independent variables are variables that can influence and cause the emergence of dependent variables. There are five independent variables in this study, namely WOTA (Working

Capital divided by Total Assets), RETA (Retained Earnings divided by Total Assets), EBTTA (Earnings Before Interests & Taxes divided by Total Assets), PBV (Price to Book Value Ratio),

and STA (Sales divided by Total Assets).

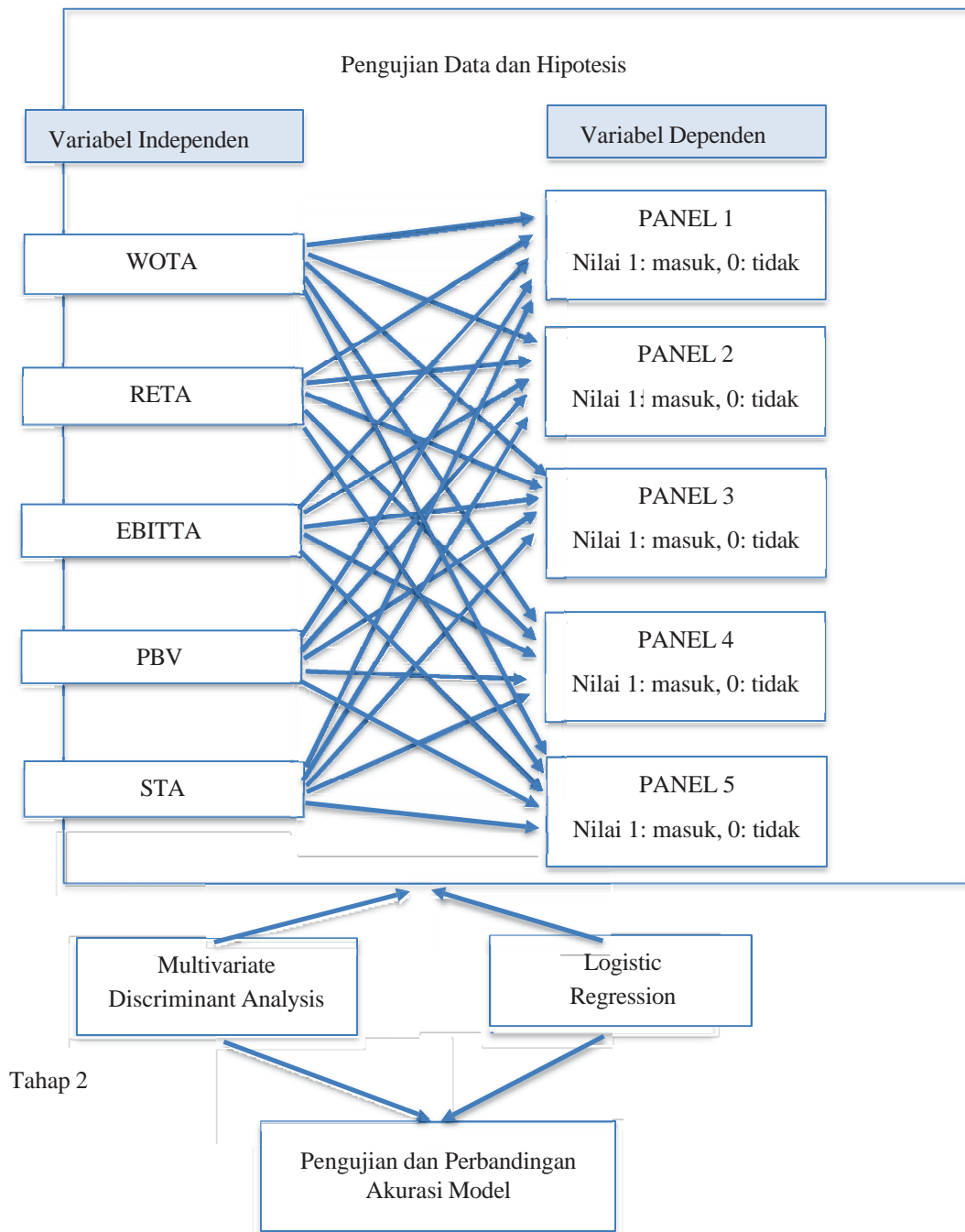Table 2 shows the operational variables of all independent variables and dependent variables.

Figure 1. Research Framework
Source: (Altman & Hotchkiss 2006)

Table 2. Operational Variables

Variable	Definition	Variable Measurement	Scale
PANEL1	Shares listed on the Indonesia Stock Exchange Monitoring Board	Value 1: shares of the company are on the Indonesia Stock Exchange Monitoring Board Value 0: means the company's shares are not on the Indonesia Stock Exchange Monitoring Board.	Nominal
PANEL2	Shares that fall into category 1 on the Indonesia Stock Exchange Monitoring Board	Value 1: the company's shares are in category 1 of the Indonesia Stock Exchange Monitoring Board Value 0: the company's shares are not in category 1 of the Indonesia Stock Exchange Monitoring Board.	Nominal
PANEL3	Shares that fall into category 7 on the Indonesia Stock Exchange Monitoring Board	A value of 1 means that the company's shares are in category 7 of the Indonesia Stock Exchange Monitoring Board. A value of 0 means that the company's shares are not in category 7 of the Indonesia Stock Exchange Monitoring Board.	Nominal
PANEL4	Shares that fall into category 6 on the Indonesia Stock Exchange Monitoring Board	A value of 1 means that the company's shares are in category 6 of the Indonesia Stock Exchange Monitoring Board. A value of 0 means that the company's shares are not in category 6 of the Indonesia Stock Exchange Monitoring Board.	Nominal
PANEL5	Shares that fall into category 5 on the Indonesia Stock Exchange Monitoring Board	A value of 1 means that the company's shares are in category 5 of the Indonesia Stock Exchange Monitoring Board. A value of 0 means that the company's shares are not in category 7 of the Indonesia Stock Exchange Monitoring Board.	Nominal
WOTA	The size of the company's net liquid assets relative to total assets. The assets used are tangible assets only, without involving intangible assets. (Altman & Hotchkiss, 2006)	$WOTA = \dfrac{Working\ Capital}{Total\ Asset}$	Rasio
RETA	The total value of earnings reinvested into the company and/or company losses throughout its life. (Altman & Hotchkiss, 2006)	$RETA = \dfrac{Retained\ Earnings}{Total\ Asset}$	Rasio
EBTTA	A measure of the productivity of a company's assets, independent of taxes and leverage factors. (Altman & Hotchkiss, 2006)	$EBTTA = \dfrac{EBIT}{Total\ Asset}$	Rasio
PBV	The market price of a company's stock divided by the book value of equity per share. (Altman & Hotchkiss, 2006)	$PBV = \dfrac{Market\ Value\ af\ Share}{PBVBaak\ Value\ af\ Share}$	Rasio
STA	Aset turnover kemampuan aset perusahaan untuk mendatangkan penjualan . (Altman & Hotchkiss, 2006)	$STA = \dfrac{Sales}{Total\ Asset}$	Rasio

Data Analysis Techniques

This research used multiple discriminant analysis (MDA) and Logistic Regressions. With these two methos, the effect of independent variables on the dependent variable will the determined. The sample data is companies listed on IDX watchboard list, and a similar number of companies outside that list, random sampled as comparison data. Details of data sample and criteria are shown in table 3.

Per September 11, 2024, there are 223 companies on the IDX Watchboard List. However, for 38 of them, the financial reports or trading data are not available. Therefore, we only have 185 companies left inside the IDX watchboard list. Afterwards 185 companies outside the IDX Watchboard List were random sampled and added that are, making it 370 companies. As each company has data for the year 2022 and 2023, there are now 740 pieces of data in our dataset.

IBM SPSS is the computation tool used for this study. At data validation stage, the following tests can be run by SPSS:
1. Removing outliers.
2. Calculate descriptive statistics.
3. Normality test (required by MDA) with Kolgomorov-Smirnov and/or Shapiro-Wilk test.
4. Linearity test (required by MDA) with ANOVA test.
5. Multicolinearity (required by MDA).

IBM SPSS has features to handle both multiple discriminant analysis (MDA) and logistic regression. Because this study aims to compare the performance of these two methods, therefore the same data is used for both methods without significant modifications.

This is the procedure for MDA computation with SPSS:
1. Wilks-Lambda test to determine signficant independent variables.
2. MDA computations for signficant independent variables only.
3. Retrieve the MDA formula and confusion matrix.

This is the procedure for Logistic Regression computation with SPSS:
1. Box-Lambda test to determine significant independent variables.
2. Omnibus test for model coefficients.
3. Logistic regressions for significant independent variables only.
4. Retrieve the logit formula and confusion matrix.

Assuming everything runs smoothly, at the end of these procedures, a resulting MDA formula and logistic regression formula will be available. This formula can be tested to measure the performance of both methods. The performance of MDA and logistic regression can be compared by their corresponding confusion matrix.

Results and Discussions
Normality Test

The data normality test was tested using the Kolgomorov-Smirnov and Shapiro-Wilk tests. The results of the normality test in this study are on panel data 1, panel data 2, panel data 3, panel data 4, and panel data 5. The results of the normality test on all panel data have passed the normality test, so that it can be continued to the estimation using the Multiple Discriminant Analysis (MDA) method.

Table 3. Data Sample and Criteria

No	Criteria	Amount
1	Companies on IDX Watchboard list per September, 11 2024	223
2	Data not available	-38
3	Comparison data random sampled from companies outside IDX watchboard list	185
4	Year of data: 2022 & 2023	x 2
Total		740

Source: processed from Indonesia Stock Exchange and investing.com

Uji Multicollinearities

The next thing that needs to be tested on the data is the multicollinearity test using the Variance Inflation Factor (VIF) test. The results of the multicollinearity test using the Variance Inflation Factor (VIF) test on all panel 1 data, panel 2 data, panel 3 data, panel 4 data, and panel 5 data, the test results using the Variance Inflation Factor (VIF) test with a Collinearity Tolerance value above 0.1 and a VIF value below 10, so that the data on all panel data are free from multicollinearity.

Multiple Discriminant Analysis (MDA)

After testing and computing the data, here is the resulting MDA based model formula. Using this formula, a company would be placed in IDX watchboard list if Z-Score > 0:

The precision of MDA based model formula is 68.7%, as shown in table 4.

Logistic Regression

After testing and computing the data, here is the resulting logistic regression-based model formula. Using this formula, a company would be placed in IDX watchboard list if P > 0.5

The precision of logistic regression-based model formula is 70.5%, as shown in table 5.

$$Z - Score = 0{,}208 - 0{,}374.WOTA - 0{,}518.RETA - 1{,}656.EBTTA - O{,}004.PBV - 0{,}250.STA$$

$$P = \frac{\exp(0.179 - 0.126\,WOTA - 1.177RETA - 4.512EBITTA - 0.003PBV - 0.068\,STA)}{1 + \exp(0.179 - 0.126\,WOTA - 1.177RETA - 4.512EBITTA - 0.003PBV - 0.068\,STA)}$$

Tabel 4. MDA based model confusion matrix

	Predicted Group Membership	
	Outside	**Inside**
Outside	284 (78.2%)	79 (21.8%)
Inside	146 (41.0%)	210 (59.0%)
68.7% of original grouped cases correctly classified		

Source: Output IBM SPSS, 2024

Table 5. Logistic regression-based model confusion matrix

	Predicted Group Membership	
	Outside	**Inside**
Outside	278 (76.6%)	85 (23.4%)
Inside	127 (35.8%)	228 (64.2%)
70.5% of original grouped cases correctly classified		

Source: Output IBM SPSS, 2024

Table 6. Impact of independent variables

	MDA	**Logistic Regression**
EBTTA	-1,656	-4,512
RETA	-0,518	-1.177
WOTA	-0,374	-0.126
STA	-0,250	-0.068
PBV	-0,004	-0.003

Source: Output IBM SPSS, 2024

Independent variables sorted by impact on the presence of company

MDA and Logistic Regression test results show consistency in the order of independent variables that cause greater impact on the present of a company on the IDX watchboard list. According to both methods, the independent variable with most impact is EBTTA (earnings before taxes / total asset) and the independent variable with least impact is PBV (price to book value ratio). The order of independent variables sorted descendently by their impact is constantly EBBTA, RETA, WOTA, STA, PBV.

H1: Impact of WOTA (working capital/total asset) on the presence of company

The first hypothesis says that WOTA (working capital/total asset) impacts the presence of company on IDX watchboard list. The test results indicate that WOTA has a significant negative impact on the presence of the company on the IDX watchboard list. This means the higher the that higher the WOTA, the less likely the company will be listed on IDX watchboard list.

H2: Impact of RETA (retained earnings/total asset) on the presence of company

The second hypothesis says that RETA (retained earnings/total asset) impacts the presence of the company on IDX watchboard list. The test results indicate that RETA has a significant negative impact on the presence of the company on the IDX watchboard list. This means the higher the RETA, the less likely the company will be listed on the IDX watchboard list. Of the five independent variables, RETA has the second most impact on the presence of the company on the IDX watchboard list.

H3: Impact of EBTTA (earnings before tax/total asset) on the presence of company

The third hypothesis says that EBTTA (earnings before tax/total asset) impacts the presence of company on IDX watchboard list. The test results indicate that EBTTA has a significant negative impact on the presence of the company on the IDX watchboard list. This means the higher the EBTTA, the least likely the company will be listed on the IDX watchboard list. Of the five independent variables, EBTTA has the highest impact on the presence of the company on the IDX watchboard list.

H4: Impact of PBV (price to book value ratio) on the presence of company

The fourth hypothesis says that PBV (price to book value ratio) impacts the presence of company on IDX watchboard list. The test results indicate that PBV has a significant negative impact on the presence of the company on the IDX watchboard list. This means the higher the that higher the PBV, the least likely the company will be listed on IDX watchboard list. However, Of the five independent variables, PBV has the lowest impact on on the presence of company on IDX watchboard list.

H5: Impact of STA (sales/total asset) on the presence of company

The fifth hypothesis says that STA (sales/total asset) impacts the presence of company on IDX watchboard list. The test results indicate that STA has a significant negative impact on the presence of the company on the IDX watchboard list. This means the higher the higher the STA, the least likely the company will be listed on IDX watchboard list.

Discussions

The test results show that all independent variables impacts negatively on the presence of company on IDX watchboard list. This is not surprising only underperforming companies struggling financially should be on the IDX watchboard list. Our independent variables are financial indicators, and only companies that show bad financial indicators should be on the IDX watchboard list.

However, although all financial indicators in this study impact negatively on the presence of company on IDX watchboard list, the magnitude of that impact varies. As shown in table 4.3, EBTTA (earnings before tax/total asset) has the highest impact on the presence of the company on IDX watchboard list. RETA (return earnings/total asset) has the second most impact on the presence of the company on the IDX watchboard list.

PBV (price to book value ratio) has the lowest impact on the presence of the company on the IDX watchboard list. As PBV is the only financial indicator in this study with computation involving trading data, it could mean that investors are not taking IDX watchboard list as something important yet.

Managerial implications

The results of this study can be used as a tool for investors before deciding to buy a stock, namely, to

predict whether the stock will enter the monitoring board in the next two years or not. The low influence of PBV indicates public indifference to this monitoring board. Therefore, the Financial Services Authority needs to pay more attention to providing education to avoid buying stocks with poor financial performance.

Conclusions and Recommendations

Conclusions

The findings of this study conclude that the following financial indicators impact negatively on the presence of a company on the IDX watchboard list:

1. WOTA: working capital / total assets.
    Working capital represents a company's ability to cover its short-term obligations and operational need, calculated by subtracting the company's current liabilities from its current assets. For this experiment, it is shown that the larger working capital divided by total assets, the less likely the company will be listed in IDX watchlist board.

2. RETA: retained earnings / total assets.
    Retained earnings may have positive or negative value. Positively retained earnings represent the portions of a company's net income that is kept by the company and not distributed to shareholders as dividend. Negative retained earnings are also known as retained or accumulated deficit, happening when the company's total net earnings minus its cumulative dividends result in negative balance. Retained earnings are a value accumulated since the start of the company. For this experiment, it is shown that the larger the retained earnings are divided by total assets, the less likely the company will be listed on the IDX watchlist board.

3. EBTTA: earnings before taxes / total assets.
    Positive EBTTA represents the ability of a company to utilize its assets in order to generate earnings. Negative EBTTA represents the amount of loss of the company's loss, divided by total asset. In this study, it is shown that the larger earnings divided by total assets, the less likely the company will be listed in IDX watchlist board.

4. PBV: market value of equity/book value of equity.

PBV represents how much the market believes in a company. A PBV value larger than one means market believe the company more that its actual book value. A PBV value is smaller than one which means the market believes the company less than its actual book value. In this study, it is shown that the larger earnings divided by total assets, the less likely the company will be listed in IDX watchlist board.

5. STA: sales / total assets.
    Sales per total asset represent the ability of a company to utilize its assets in order to generate earnings. STA's value is positive or zero. In this study, it is shown that the larger earnings divided by total assets, the less likely the company will be listed in IDX watchlist board.

PBV has the weakest impact among the five variables above. It is surprising because PBV is the only variable that incorporated market transaction data in its computation. This can be interpreted as that currently investors do not take IDX Watchboard list seriously as something to consider before investing. Therefore, the Financial Service Authority (FSA) and the Indonesia Stock Exchange (IDX) must improve their methods for socializing IDX Watchboard list.

Two predictions models are generated in this study. This model may predict where a company will be on watchboard list in the next two years. There are two prediction models, one based on multiple discriminant analysis (MDA), the other on logistic regression. The test shows that logistic regression-based prediction models have better overall accuracy (70.5%) that is MDA based counterpart (67.8%). That means, the logistic regression-based model performs better than the MDA based model. This is consistent with the study of Rivanda and Muslim (2021) and Adipati (2017) that both results shown logistic regression as a more accurate approach.

Investors may use the models above before deciding to buy stocks. These models predict whether a stock will be listened to in IDX watchboard list in the next two years. Utilizing this tool may help investors to invest wisely.

Research Limitations

This research was conducted a year after the Indonesia Stock Exchange announced the

Monitoring Board, so the data obtained was not much. The data used becomes even less if the research is focused on certain categories.

Recommendations

This research is performed only one year after the Indonesia Stock Exchange officially announce the presence of IDX Watchlist board. Because the IDX Watchlist board is something new, not too much data is available at the moment. We recommend other researchers to repeat or expand this study in the next two years with more data available.

The result of this study clearly shows that logistic regression yields better results than multiple discriminant analysis (MDA). So, it's clear to say that in this study, logistic regression is superior to multiple discriminant analysis. Because of that, we recommend further studies to use logistic regression method only. With more data available in coming years, the next research should be expected to generate logistic regression models with better accuration than this study, which is 70.5%.

Classifications methods are not limited to MDA and logistic regressions. Next studies have options to use more sophisticated methods, such as neural network (NN). Studies of Adipati (2017) show that NN yields better results than both logistic regressions and MDA.

We also recommend other researchers to explore more specific aspects of this domain. For example, one study may focus on companies that are listed in IDX watchlist board because their stock price is too low. Other studies may focus on companies thats listed in IDX watchlist board because their market volume is too low. The point is, there are only a few studies on the IDX Watchlist board, so that there is a lot of room for new research.

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