# Cuadernos de economía

# Impact of Audit Committee and Financial Performance on Financial Distress Prediction: An Empirical Study of The Listed Companies in The Market for Alternative Investment (Mai)

**Ekapol Sakulpolphaisan[1], Surang Hensawang [2]**

[1] Faculty of Business Administration, Kasetsart University, Thailand; _ekapol.s@ku.th_
[2] Faculty of Business Administration, Kasetsart University, Thailand; _fbussum@ku.ac.th_
[*] Correspondence: _ekapol.s@ku.th_

**Abstract:** Businesses risk financial difficulties due to the current environment. Predicting financial distress is vital. Good company governance, like the Audit Committee, can reduce financial strain. Financial performance also affects economic suffering. A model for predicting the financial difficulty of enterprises based on the characteristics above is developed in this research. From 2017 through 2020, the model's sample includes all MAI listed companies, save those in the finance industry. The data are analyzed using logistic regression, and the robustness test is performed using the hold-out sample technique. The results reveal that audit committee meeting frequency and total liabilities to total assets are linked to financial distress. The findings demonstrated a negative association between financial distress and audit committee expertise, price-to-earnings ratio, return on assets, and revenue to total assets. The model's prediction accuracy for identifying one year, two years, and three years before the financial difficulty was 94.9 %, 96.6 %, and 96.1 %, respectively. The model's hold-out sample accuracy is between 89.0 and 98.0 %.
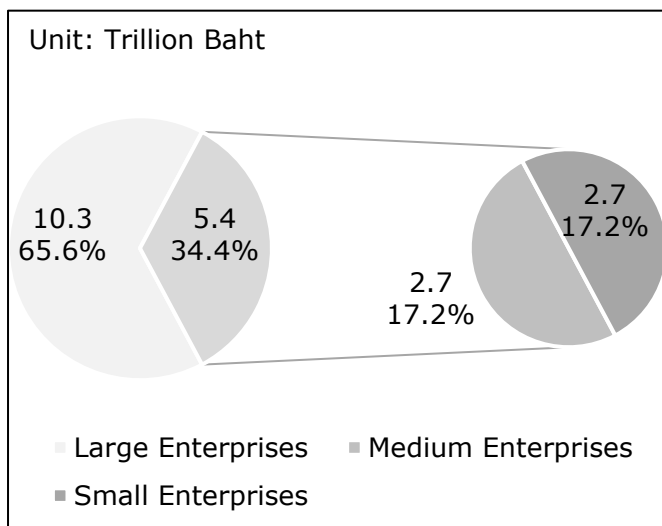
Author Correspondence: _ekapol.s@ku.th_

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## 1. Introduction

With the current atmosphere, including economic volatility, technological disruption, political turmoil, epidemics, etc., there is a high risk of corporate failure, insolvency, and bankruptcy. The COVID-19 pandemic, often known as the coronavirus pandemic, has recently been affecting corporations all over the world (El Keshky, Basyouni, & Al Sabban, 2020; Ellul, Erel, & Rajan, 2020; Johnson, Rauhaus, & Webb-Farley, 2021; Lozano & Barreiro-Gen, 2021; McMaster et al., 2020). Thailand is now dealing with the newest COVID-19 outbreak, which began in early April 2021 and is growing at a considerably faster rate and with a more significant number of clusters than previous outbreaks. As a result, companies are at substantial risk of financial distress. Rather than large companies, small businesses are more likely to experience financial difficulties. Under the previous study, Piette and Zachary (2015) found that small companies had a higher risk in operations than large companies due to the lending restriction, limitation of capital, and lack of sufficient financial and managerial capacities, which caused small companies more uncertainty than large companies.

Considering business in Thailand, Small and Medium Enterprises (SMEs) play a crucial role in the Thai economy (Chienwattanasook & Jarinto, 2020; Praditsuwan & Karnreungsiri, 2018). SMEs have long been a vital sector of the Thai economy, contributing to innovations, new products, employment, and income distributions. Promotion. (2021) reported that 3.1 million Thai SMEs employed 12.7 million positions, equivalent to 71.7 % of employment opportunities. In addition, Thai SMEs generated 5.4 trillion baht in GDP, accounting for 34.2 % of the country's overall GDP, as shown in Figures 1 and 2. As aforementioned, SMEs with solid financial performance can propel the Thai economy.

On the other hand, the Thai economy will slump once SMEs have accessed financial distress. Most importantly, if the economic distress occurs with listed companies on the Stock Exchange of Thailand (v) or MAI, this affects several stakeholders and impacts the entire Thai economy. The listed companies in the MAI are more likely to face financial distress than those on the SET because the MAI is a secondary market of the Thai capital market where SMEs raise capital funds.
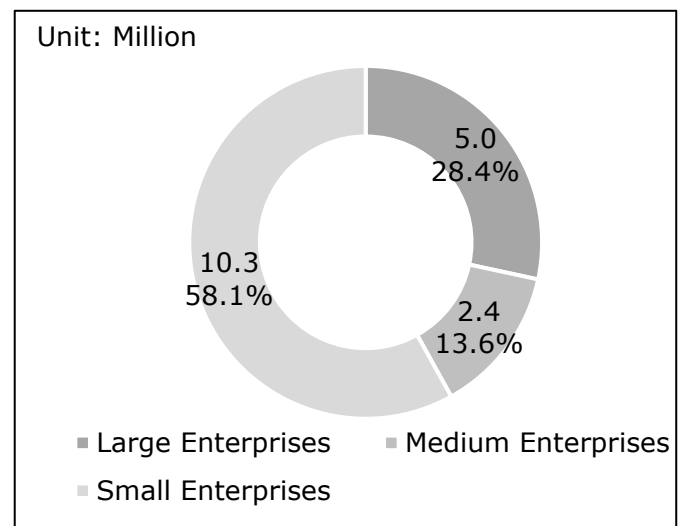


Source: Promotion. (2021)
Figure 1: Structure of Thailand's GDP in 2021



Figure 2: Structure of Employment in 2021

Organizations require accurate tools to predict financial difficulties. Companies can reduce risk and avoid economic misery with an appropriate warning signal. Predicting insolvency or financial trouble is a popular topic. Theoretical and empirical methods and models abound. The late 1960s saw significant advances in modeling financial crises. Beaver (1966), Edward I. Altman (1968), and Ohlson (1980) predict financial trouble using financial ratios. Financial distress prediction is an essential area of research.

The audit committee should also contribute along with the aforesaid financial ratios. The audit committee study is significant, with research showing the impact of effective corporate governance on business financial difficulties (Alqatamin, 2018). The lack of corporate governance triggered several financial scandals. Thailand's 1997 financial crisis was caused by poor information sharing and a lack of openness. Most studies agree that audit committees are the cornerstone of corporate governance because they mitigate financial distress risk by improving boards' management supervision. Despite its relevance, no research has linked audit committees to financial difficulties.

According to financial distress and the importance of the audit committee, this paper investigates whether the audit committee and financial performance impact the financial

distress prediction of listed companies in MAI and how to construct the financial distress prediction model of listed companies in MAI. This article also examines the impact of the audit committee and financial performance on financial distress predictions of MAI-listed businesses and develops a model for forecasting financial hardship of companies based on the audit committee and economic performance parameters.

## 2. Literature review

### 2.1 Agency Theory and Audit Committee

Much research on agency theory, based on Jensen and Meckling (1976), explained the relationship between the principal and agent in an organization. In a principal-agent relationship, good governance enables the agents to operate the business and decide in the best interests of the organization. However, there might be conflicts of interest caused by the agents' decisions which they shall make the findings more aligned with their interests rather than the principal's best interests. The agents shall focus on their interests rather than those of the shareholders by consuming perquisites (PERK). Jensen and Meckling (1976) asserted that the principle should apply the monitoring mechanism to control the agent's operation and decided to resolve the agency cost problem.

Corporate governance has been an essential procedure for companies to resolve agency problems as a monitoring mechanism (Chatchawanchanchanakij, Arpornpisal, & Jermsittiparsert, 2019; Kongsasone, Dampitakse, & Phoprachak, 2019). A monitoring mechanism helps the principals ensure that the agents or the executive can exercise their decision based on the best interests of the principals and the most benefits of the company (Jensen & Meckling, 1976). It is generally agreed that the audit committee plays a critical role in governance practices, especially in improving the board of directors' effectiveness in terms of monitoring mechanisms. In recent years, the duty of the audit committee has been more emphasized in examining and preparing financial statements. The audit committee has played a significant role in all facets of the relationships between the board of directors and internal and external auditors. Given one of the corporate governance mechanisms, the audit committee dictates the business best practices in transparency. The audit committee is considered a necessary internal governance instrument. It is expected to provide a significant role as a vital internal governance instrument that is expected to play an essential role in the whole process of financial reporting, mainly the function of auditors as an internal control system. By monitoring the company to be more transparent, the information asymmetries shall be decreased. Thus, this shall enable the company to reduce agency costs (Alqatamin, 2018).

## 2.2 Audit Committee, Financial Performance or Financial Ratio and Control Variables on Financial Distress Prediction

The audit committee plays a critical role in protecting shareholder interests by reviewing the firm's financial reporting and auditing processes. In light of this, it is anticipated that a competent audit committee will decrease agency difficulties and hence reduce the likelihood of financial hardship. According to previous research on audit committees, the effectiveness of audit committees depends on their qualities. A larger audit committee with members with various experiences can enhance the monitoring function, decreasing the likelihood of financial difficulty (Alqatamin, 2018). According to Chotiyaputta (2018), female audit committee directors tend to be more independent than their male counterparts, enhancing the firms' monitoring function. In addition, audit committee members should have accounting and finance skills. The committee is accountable for the accuracy of financial reporting Rickling (2014) discovered that an audit committee with accounting and finance competence is negatively associated with a company's financial difficulty.

In terms of the frequency of audit committee meetings, previous empirical investigations have produced varied findings. Rickling (2014) indicates that frequent audit committee meetings could improve the efficiency of monitoring activities and the performance of organizations. Alqatamin (2018), on the other hand, says that a higher frequency of meetings is ineffective in monitoring roles that have a significant positive correlation with the financial difficulty of organizations. In addition, audit committee tenure positively affects companies' financial distress. Rickling (2014) asserts that a long-serving audit committee may be less unbiased in assessing the company's best interests. Also, Rickling (2014) indicates that audit committees with several directorships may not have sufficient time to oversee the financial report process and advise management. Therefore, many audit committee directorships should have a significant positive correlation with the financial difficulties of corporations. According to a previous study, the features of audit committees are measured as shown in Table 1.

Financial ratios are primarily reported in both internal and external financial reports. More importantly, the financial ratios are considered the primary source of information to assess the financial health of the companies. The key financial ratios consist of accounting and market-generated variables, including profitability, liquidity, leverage, activity, and market value ratios. Profitability ratios measure the earning capacity of the companies, which helps to provide the ability of the companies to generate profit (Fawzi, Kamaluddin, & Sanusi, 2015; Fedorova, Gilenko, & Dovzhenko, 2013). Accounting ratios also include liquidity ratios, which indicate if a company has sufficient liquidity to meet its financial obligations (Geng, Bose, & Chen, 2015). Leverage ratios are crucial indicators of how a company finances its investments with funds from external sources. Activity ratios demonstrate how a company uses its internal resources to create income and the efficacy of its asset turnover (Fedorova et al., 2013; Geng et al., 2015). In addition to accounting-based ratios, market-generated ratios can provide substantial insight into a company's financial health. The efficient stock prices are responsive to all publicly available information about the companies, and these stock prices demonstrate more excellent knowledge than past financial statements (Trejo Pech, Noguera, & White, 2015).

The previous studies on financial distress prediction using the statistical technique or the quantitative models are back to the 1960s. Beaver (1966) was one of the first researchers who used these quantitative techniques by using univariate discriminant analysis (Ellul et al.) to predict financial distress. In line with the recommendation from Beaver (1966), Edward I. Altman (1968) used multiple discriminant analysis (MDA) with the use of numerous financial performance ratios to predict financial distress, known as the Z-score. With the advance in technology, Ohlson (1980) developed financial distress prediction using the logistic regression model (Logit). Compared to the MDA, the Logit was easier to understand as it was interpretable in a probabilistic way.

Klein (2002) investigated whether audit committee and board characteristics were associated with earnings management by the firm and detected a negative association between audit committee independence and abnormal accruals. Additionally, they discovered a negative correlation between board autonomy and abnormal accruals. Habib (2004) investigated the impact of earnings management on the value relevance of accounting information in Japan. Based on 5,318 close firm-year observations from 1992 to 1999, the researchers discovered that earnings management measures and aggregate earnings management measures were negatively associated with the combined value relevance of book values of equity and earnings and the value relevance of payments. Li, Abeysekera, and Ma (2011) investigated the relationship between earnings management and earnings quality for Chinese firms listed on the Shanghai and Shenzhen stock markets from 2003 to 2007. They reported that earnings management could predict future profitability better than earnings quality. In addition, they concluded that the rate of wages declined during the study period. Aldaman, Duncan, Kelly, McNamara, and Nagel (2012) studied the effect of audit committee features on a company's performance during a financial crisis. Findings indicate that smaller audit committees with more significant experience and financial knowledge are more likely to be associated with favorable business performance in the market, while longer tenures of audit committee heads harm accounting performance.

Shahwan (2015), in the case of 86 non-financial Egyptian listed companies, investigated the impact of corporate governance on financial distress and firm performance. Results show a negative relationship between CG practices and the likelihood

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of financial distress and indicate that firm-specific characteristics could be helpful as a first-pass screen in determining firm performance and the possibility of financial distress. Ranjbar and Amanollahi (2018) identify the factors associated with earnings management to determine the relationship between the elements and manipulated profits to see the effect of corporate financial distress on unpredicted net earnings and corporate profits on accepted companies in the Tehran Stock Exchange over the period 2010-2015 by using linear regression using panel data. Findings show that financial distress, institutional ownership, annual sales growth, company loss, company size, the company's market share, and firm fixed costs are statistically meaningful, and these independent variables predict unforeseeable profit and earnings management. Pernamasari, Purwaningsih, Tanjung, and Rahayu (2019) investigate financial distress prediction and its relationship with corporate governance Indonesian stock market by using the Atman Z Score approach. The study results indicate that good corporate governance and forecast of financial distress have a significant positive effect on stock prices.

Further, it suggests that the audit committee will work more effectively if the proportion of audit committee members has expertise in accounting, auditing, internal control, and finance. Rafatnia et al. (2020) conducted a study to explore the factors of financial distress prediction in the case of 300 Iranian public companies during the periods of 2000-2007 and 2009-2016 and data analysis by following Logistic regression and decision trees the prediction of financial distress. Results show that the profitability, liquidity, leverage, interest rate, cash flow, accruals, and GDP were statistically significant in distinguishing distressed from non-distressed firms across sectors. Many previous studies indicate that some macroeconomics factors predict financial distress, such as interest rate, inflation, gross domestic product, monetary policy, oil price, financial crisis, and debt crisis (Alifiah, 2014; Liou & Smith, 2007; Tinoco & Wilson, 2013). Further macroeconomic conditions have good explanatory power for financial distress prediction and help model credit risk (Tinoco & Wilson, 2013). Bhattacharjee and Han (2014) investigate the impact of microeconomic factors and macroeconomics on the financial distress of Chinese listed companies over a massive economic transition from 1995 to 2006. Findings indicate that firm characteristics, macroeconomic instability, and institutional factors on the hazard rate of financial distress. Gunawan and Putra (2021) determine economic distress factors by utilizing the data of manufacturing companies listed 61 on the Indonesia Stock Exchange and 62 on the Malaysia Stock Exchange from 2017 to 2018. Multiple linear regression indicates that financial performance negatively relates to financial distress, and proxies of corporate governance such as the Board of Directors, and the Audit Committee did not influence financial distress.

In addition to the audit committee characteristics and financial ratios, additional studies have identified several internal and external causes of financial difficulty. According to prior studies, firm age (Aldamen et al.) is the most critical factor in determining the causes of financial hardship. Due to a lack of financial and controlling experience, Kücher, Mayr, Mitter, Duller, and Feldbauer-Durstmüller (2020) argued that younger enterprises under eight years are more likely to face financial hardship than older companies. In addition, a large body of research indicates that the industry sector (IND) significantly differentiates the likelihood of financial difficulty. Horak, Vrbka, and Suler (2020) found a correlation between the technology industry and the possibility of financial trouble. Also, Horak et al. (2020) identified the sector with the highest

likelihood of economic crisis as the industrial and property & construction industry, which makes sense given the rapid depreciation of intangible and tangible fixed assets. External factors, such as the status of the business cycle and the macroeconomic climate, also affect financial distress and internal factors. Pacini, Berg, Tischer, and Johnson (2017) analyzed the effect of macroeconomic parameters on the financial performance of the United Kingom and found a positive correlation between GDP and the likelihood of financial performance. The findings of prior studies studying the causes of economic hardship, such as firm age, industry sector, and GDP, are summarized in Table 1 and considered control variables to create the subsequent hypotheses. The definitions of twelve financial ratios taken from prior studies are presented in Table 1. These variables were selected based on their appropriate prediction capacity in the recognized literature and applicability to this scenario.

## 2.3 Hypotheses Development

Based on the study of relevant literature, audit committee features impact the financial hardship of organizations. It is intriguing to learn more about the relationship between audit committee features and financial trouble forecasting. Under prior research, a larger audit committee size, the presence of female audit committee directors, and the accounting and financial expertise of audit committee members harm financial distress due to the enhancement of business operation monitoring. On the other hand, the greater frequency of audit committee meetings, audit committees with lengthy tenures, and audit committees with several directorships benefit financial distress due to inadequate and ineffective monitoring.

Considering the implications of the findings of financial ratios on the prediction of financial distress in the literature, the significant financial ratios are picked for both their positive and negative effects on economic desperation. Liquidity, as assessed by CACL; profitability, as measured by ROA, GPM, ROE, and CFNP; leverage, as measured by CFNT and CFTL; and activity, as measured by RTA, indicate the status of a company's financial health, and hence harm financial distress. In addition, the market value expressed by PE and PBV indicates a favorable outlook, so a negative impact is anticipated. However, debt financing results in financial risk. Therefore, it is expected that leverage will negatively affect financial hardship as measured by TLTA and CLTA.

In addition, control variables, including AGE and GDP, negatively impact financial distress due to the readiness and growth of the business operation. Notwithstanding, IND has both positive and negative impacts on financial distress. Technology, Industrial Property & Construction industries exposed more a tendency to have financial distress, while Agribusiness & Food, Consumer Products, Resources, and Services industries presented the less likely to have financial distress. Based on this discussion, the related hypotheses are constructed as follows:

H1: ACSZ, H2: ACGD, H3: ACAF, H7: CACL, H10: CFNT, H11: CFTL, H12: ROA, H13: GPM, H14: ROE, H15: CFNP, H16: RTA, H17: PE, H18: PBV, H19: AGE, H20: IND and H21: GDP harm financial distress

H4: ACNM, H5: ACPR, H6: ACMD, H8: TLTA, and H9: CLTA have a positive impact on financial distress

The association between audit committee characteristics, financial ratios, control variables, and financial distress status can be demonstrated as a conceptual framework in Figure 3.

Table 1: Definition and Measurement of Audit Committee Characteristics, Financial Ratios, and Control Variables

| Code | Definition and Measurement | Reference |
|---|---|---|
| **Panel A: Audit Committee Characteristics** | | |
| ACSZ | Audit Committee Size (Number of Audit Committee members) | Rickling (2014), Alqatamin (2018) |
| ACGD | Audit Committee Gender (Number of Female members of Audit Committee) | Chotiyaputta (2018) |
| ACAF | Audit Committee Expertise (Number of Audit Committee members who have accounting or financial expertise) | Rickling (2014) |
| ACNM | Audit Committee Meeting (Number of Audit Committee Meetings) | Rickling (2014), Alqatamin (2018) |
| ACPR | Audit Committee Period (The proportion of members of Audit Committee with a position more than one period and total members of Audit Committee) | Rickling (2014) |
| ACMD | Audit Committee Multiple Directorships (The proportion of the number of members of Audit Committee who serve on multiple boards in other companies to members of Audit Committee) | Rickling (2014) |
| **Panel B: Financial Ratios** | | |
| **Liquidity Ratios** | | |
| CACL | Liquidity (Current Assets / Current Liabilities) | Beaver (1966), Ohlson (1980), Geng et al. (2015) |
| **Financial Leverage Ratios** | | |
| TLTA | Total Liabilities to Total Assets (Total Liabilities / Total Assets) | Beaver (1966), Ohlson (1980), Geng et al. (2015) |
| CLTA | Current Liabilities to Total Assets (Current Liabilities / Total Assets) | Fedorova et al. (2013), Geng et al. (2015) |
| CFNT | Cash Flow from Operation to Interest (Cash Flow from Operation / Interest Expense) | Fawzi et al. (2015) |
| CFTL | Cash Flow from Operation to Total Liabilities (Cash Flow from Operation / Total Liabilities) | Fawzi et al. (2015) |
| **Profitability Analysis Ratios** | | |
| ROA | Return on Assets (Net Profit / Total Assets) | Beaver (1966), Ohlson (1980), Geng et al. (2015) |
| GPM | Gross Profit Margin (Gross Profit / Total Revenue) | Fedorova et al. (2013) |
| ROE | Return on Equity (Net Profit / Total Equity) | Fedorova et al. (2013) |
| CFNP | Cash Flow from Operation to Net Profit (Cash flow from Operation / Net Profit) | Fawzi et al. (2015) |
| **Activity Ratios** | | |
| RTA | Revenue to Total Assets (Revenue / Total Assets) | Beaver (1966), Ohlson (1980), Geng et al. (2015) |
| **Market Value Ratios** | | |
| PE | Price to Earnings per share Ratio (Price / EPS) | Trejo Pech et al. (2015) |
| PBV | Price to Book Value Ratio (Price / Book Value) | Trejo Pech et al. (2015) |
| **Panel C: Control Variables** | | |
| AGE | Firm Age (1 = Firm age up to 8 years, 0 = Firm age above 8 years) | Kucher et al. (2020) |
| IND | Industry Sector (1 = Industrials, Property & Construction and Technology, 0 = Agribusiness & Food, Consumer Products, Resources and Services) | Horak et al. (2020) |
| GDP | Gross Domestic Product (Amount of Gross Domestic Product) | Pacini et al. (2017) |

The obstacles can be (1) Basic infrastructure (electricity, energy, land), (2) Transport infrastructures (roads, airports), (3) Communication infrastructures, (4) Financing constraints (credits, foreign capital), (5) Labor force (in terms of numbers), (6) Technological know-how (skilled labor), (7) Technologies (machinery, equipment). Table 2 presents the statistical description of explanatory variables. In our empirical model, as described in Table 3, we also investigate the role of technology transfer on the economic linkages by examining a set of four different technology transfers: (1) Technology backward linkage with a domestic supplier (TBLDS), (2) Technology backward linkage with a foreign supplier (TBLFS), (3) Technology forward linkage with a domestic customer (TFLDC)), and (4) Technology forward linkage with a foreign customer (TFLFC).

## 3. Research Methodology

### 3.1 Sample and data collection

To run the model for financial distress prediction and test the hypotheses, sample companies are drawn from MAI except for

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the finance industry, subject to distinct regulations. Companies lacking audit committee features and financial ratio information are also omitted. At the end of 2020, the analyzed sample of enterprises consisted of 161 companies. The analysis spans 2017 to 2019, three years before the companies' financial difficulty in 2020. According to the sample selection criteria and study duration, 804 observations are investigated. There were 414 observations for the period before financial distress, consisting of 363 non-financially distressed and 51 financially distressed comments. Two years before financial hardship,

there were 263 observations, which can be classified into 229 non-financial distress and 34 economic distress observations. There were 127 observations with three years of past financial distress, including 110 non-financially distressed and 17 financially distressed observations. Audit committee characteristics and control variables are extracted from the company's annual report (Form 56-1) and made available online via the SET website. SETSMART is used to retrieve financial ratios and firm status (the SET web-based application).
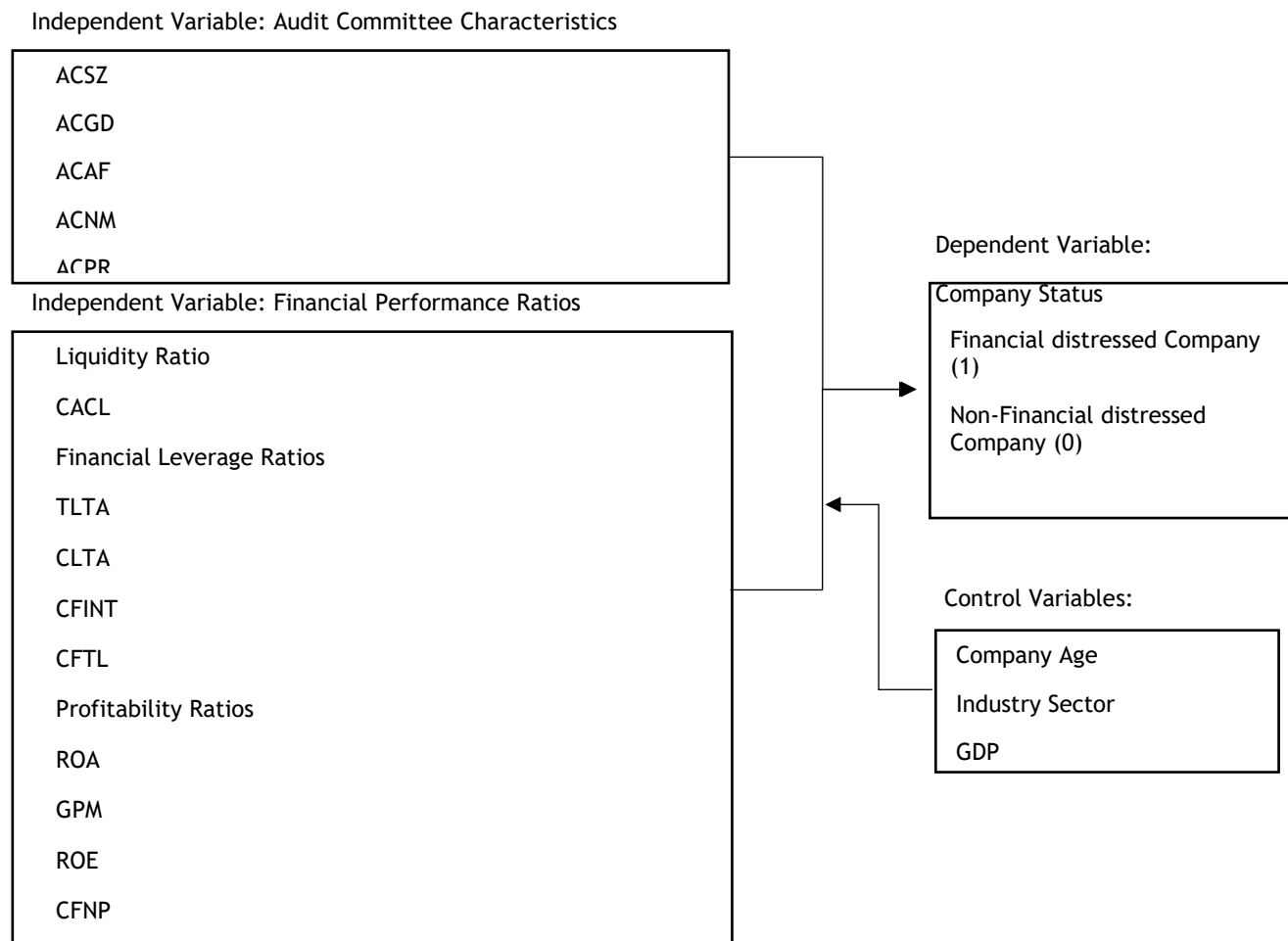


Figure 3: Conceptual Framework

## 4. Variables

Three types of variables in this paper associated with the hypothesized conceptual model include dependent, independent, and control variables. Dependent variable company status is defined by using the SET regulation. v (2018), companies with the caution "C" sign face the circumstances that may impact the listed companies regarding the financial position and business operation. In this study, companies with C sign under the subject of financial situation and financial statements are considered in financial distress. Under the C sign, company status is valued as "1" when SET posts C during a specific period and "0" otherwise. Independent variables and Control variables are described in the literature review.

### 4.1 Analysis of the Impact on Financial Distress and Model Construction

The binary logistic regression is used to examine the impact of independent variables on financial distress. Regarding the previous literature, logistic regression is an appropriate

technique for this context, as there are different sample sizes of financially distressed and non-financial distressed groups. Ohlson (1980) affirms that the probability of independent variables is not required to be a normal distribution. The logistic regression model is compared based on prediction for one year, two years, and three years before financial distress. To test the hypotheses, the following logistic regression is constructed as follows:

One year prior to financial distress:

$$\text{Log}(P(Y=1))_{i,t} = \beta_0 + \beta_1 ACSZ_{i,t-1} + \beta_2 ACGD_{i,t-1} + \beta_3 ACAF_{i,t-1} + \beta_4 ACNM_{i,t-1} + \beta_5 ACPR_{i,t-1} + \beta_6 ACMD_{i,t-1} + \beta_7 CACL_{i,t-1} + \beta_8 TLTA_{i,t-1} + \beta_9 CLTA_{i,t-1} + \beta_{10} CFINT_{i,t-1} + \beta_{11} CFTL_{i,t-1} + \beta_{12} ROA_{i,t-1} + \beta_{13} GPM_{i,t-1} + \beta_{14} ROE_{i,t-1} + \beta_{15} CFNP_{i,t-1} + \beta_{16} RTA_{i,t-1} + \beta_{17} PE_{i,t-1} + \beta_{18} PBV_{i,t-1} + \beta_{19} AGE_{i,t-1} + \beta_{20} IND_{i,t-1} + \beta_{21} GDP_{i,t-1} + \varepsilon$$

Two years prior to financial distress:

$$\text{Log}(P(Y=1))_{i,t} = \beta_0 + \beta_1 ACSZ_{i,t-2} + \beta_2 ACGD_{i,t-2} + \beta_3 ACAF_{i,t-2} + \beta_4 ACNM_{i,t-2} + \beta_5 ACPR_{i,t-2} + \beta_6 ACMD_{i,t-2} + \beta_7 CACL_{i,t-2} + \beta_8 TLTA_{i,t-2} +$$

$\beta_9CLTA_{i,t-2} + \beta_{10}CFINT_{i,t-2} + \beta_{11}CFTL_{i,t-2} + \beta_{12}ROA_{i,t-2} + \beta_{13}GPM_{i,t-2} + \beta_{14}ROE_{i,t-2} + \beta_{15}CFNP_{i,t-2} + \beta_{16}RTA_{i,t-2} + \beta_{17}PE_{i,t-2} + \beta_{18}PBV_{i,t-2} + \beta_{19}AGE_{i,t-2} + \beta_{20}IND_{i,t-2} + \beta_{21}GDP_{i,t-2} + \varepsilon$

Three years prior to financial distress:

$Log\ (P\ (Y=1))_{i,t} = \beta_0 + \beta_1ACSZ_{i,t-3} + \beta_2ACGD_{i,t-3} + \beta_3ACAF_{i,t-3} + \beta_4ACNM_{i,t-3} + \beta_5ACPR_{i,t-3} + \beta_6ACMD_{i,t-3} + \beta_7CACL_{i,t-3} + \beta_8TLTA_{i,t-3} + \beta_9CLTA_{i,t-3} + \beta_{10}CFINT_{i,t-3} + \beta_{11}CFTL_{i,t-3} + \beta_{12}ROA_{i,t-3} + \beta_{13}GPM_{i,t-3} + \beta_{14}ROE_{i,t-3} + \beta_{15}CFNP_{i,t-3} + \beta_{16}RTA_{i,t-3} + \beta_{17}PE_{i,t-3} + \beta_{18}PBV_{i,t-3} + \beta_{19}AGE_{i,t-3} + \beta_{20}IND_{i,t-3} + \beta_{21}GDP_{i,t-3} + \varepsilon$

Where   i   =   independent variables
t   =   year of company status
β   =   coefficient
ε   =   error

Firstly, it is essential to examine whether the mean of independent variables is significantly different between the financially distressed and non-financial distressed companies. Secondly, Pearson correlation is used to detect the multicollinearity problems of the chosen variables. Following Altman et al. (2019), the multicollinearity problems are tested within each group of independent variables, including five groups of financial ratios and one group of the audit committee. If the correlation result is considered a high correlation, then the independent variable with the highest correlation with the dependent variable will be maintained. Thirdly, logistic regression with the stepwise method examines the selected variables. Fourthly, Chi-square and Hosmer-Lemeshow are used to explore the fitness and appropriateness of the model. In addition, Wald statistic and the log-likelihood are used to examine the reliability and validity of the model. To explain the appropriate goodness of fit statistic ($R^2$), the value of Cox & Snell $R^2$ and Nagelkerke $R^2$ are applied to explain the variance of the independent variables with the incidence of financial distress. For the model's predictability, the accuracy matrix set up by Altman (1968) is illustrated to show accurate classification. Lastly, the logistic regression on the hold-out sample is established to observe the accuracy of the conceptual model in predicting financial distress. The hold-out sample is chosen from the original sample using five replications, including simple random sampling, systematic sampling, stratified sampling, cluster sampling, and multi-stage sampling. The robustness of results shall be reliable when the prediction accuracy, including the combination of Type I and Type II errors, is at least 80% (Edward I Altman, Hotchkiss, & Wang, 2019).

## 5.    Research Results

### 5.1    Empirical Results
Table 2 displays the results of the test of equality of means for each independent variable. Eleven variables reject the null hypothesis for one year before financial difficulty, ten variables for two years before financial distress, and seven variables for three years before financial distress. Consequently, these variables are preserved for future processing.

After testing each group of independent variables in Table 2 for multicollinearity, the results indicate that particular variables must be deleted. All selected variables are statistically significant and pass the multicollinearity test, as shown in Table 3. Two variables are excluded, leaving nine variables for one-year preceding financial strain, as determined by the results.

Eight out of 10 variables are maintained for two years before financial difficulty. In addition, four out of seven variables are present three years before financial trouble.

### 5.2    Logistic Regression Results
Logistic regression with the stepwise method is applied to investigate selected variables upon each sample of one year, two years, and three years before financial distress. The results from Table 4 depict that the final model identifies two positively significant variables consisting of ACNM (ß = 0.325) and TLTA (ß = 2.790) and three negatively significant variables including ACAF (ß = -1.037), ROA (ß = -0.128) and RTA (ß = -1.047) for one-year prior financial distress. The results confirm the impact of audit committee characteristics on financial distress (H3 and H4) and affirm the impact of financial ratios on financial distress (H8, H12, and H16). For the result of two years before financial distress, ACNM (ß = 0.852) and TLTA (ß = 4.754) are identified as the positive significances for predicting financial distress. Conversely, ROA (ß = -0.947) harms the probability of financial distress. These results also support H4, H8, and H12. For the three years before financial distress, the final model consists of two variables with positive effects on financial distress, including ACNM (ß = 0.495) and TLTA (ß = 5.264), and two variables with negative impacts on financial distress, including PE (ß = -0.055) and ROA (ß = -0.984). As a result, H4, H8, H12, and H17 are supported.

Several statistics in table 5 are used to measure the final model for one year, two years, and three years before the occurrence of financial distress that all are well fitted and acceptable, including Chi-square (p < 0.05), Hosmer-Lemeshow (p > 0.05), Wald (p < 0.05) and -2LL (p < 0.05). In addition, the value of Cox & Snell $R^2$ and Nagelkerke $R^2$ in table 5 are applied to explain the variance of the independent variables with the incidence of financial distress.

A classification matrix presents the model's accuracy in predicting financial distress. Table 6 presents the classification accuracy of all given cases. One year before financial distress shows, the overall accuracy rate for the model of 94.9%. Type I and Type II errors are 35.3% and 0.8%, respectively. For two years before financial distress, the overall accuracy rate is 96.6%, with Type I error of 14.7% and Type II error of 1.7%. Furthermore, for three years before financial distress, the model correctly classifies overall accuracy of 96.1%, consisting of Type I error of 17.6% and Type II error of 1.8%.

### 5.3    Robustness Check
To assess the robustness of the proposed model, the study employs the hold-out sample by selecting subsets of 100 samples from the original sample taken one year before financial difficulty. This test's primary objective is to evaluate the classification accuracy of the hold-out sample using the replication criterion. Before classifying the data, a sample t-test is conducted to determine the significance of the results (Edward I. Altman, 1968). The t-test and classification accuracy results indicate no difference between the original and hold-out samples, as the t-test rejects the hypothesis. In addition, the results of the hold-out sample's classification accuracy are comparable to the classification accuracy of the original sample. The results indicate that the hold-out sample accuracy ranges between 89.0 to 98.0 %, with an average accuracy of 93.8 %, greater than 80 %. Thus, the proposed model's resilience is satisfactory (Edward I Altman et al., 2019).

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Table 2: Test for Equality of Means for each independent variable

| Group | Variables | 1 year prior | | | 2 years prior | | | 3 years prior | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean Difference | St. Error Difference | Sig. (2-tailed) | Mean Difference | St. Error Difference | Sig. (2-tailed) | Mean Difference | St. Error Difference | Sig. (2-tailed) |
| Audit Committee | ACSZ | 0.038 | 0.058 | 0.511 | 0.034 | 0.068 | 0.620 | 0.009 | 0.095 | 0.928 |
| | ACGD | -0.270 | 0.076 | 0.001** | -0.216 | 0.120 | 0.073 | -0.229 | 0.172 | 0.186 |
| | ACAF | -0.299 | 0.054 | 0.000** | -0.237 | 0.075 | 0.002** | -0.205 | 0.114 | 0.080 |
| | ACNM | 1.863 | 0.518 | 0.001** | 1.787 | 0.635 | 0.008** | 1.512 | 0.540 | 0.006** |
| | ACPR | -0.135 | 0.058 | 0.020** | -0.161 | 0.073 | 0.027* | -0.107 | 0.107 | 0.318 |
| | ACMD | 0.003 | 0.045 | 0.946 | 0.020 | 0.054 | 0.714 | -0.012 | 0.076 | 0.879 |
| Liquidity | CACL | -0.750 | 0.398 | 0.060 | -1.112 | 0.481 | 0.022* | -1.089 | 0.762 | 0.155 |
| Leverage | TLTA | 0.395 | 0.102 | 0.000** | 0.366 | 0.097 | 0.001** | 0.323 | 0.091 | 0.003** |
| | CLTA | 0.356 | 0.104 | 0.001** | 0.306 | 0.100 | 0.004** | 0.282 | 0.092 | 0.007** |
| | CFINT | -8280.8 | 9107.3 | 0.364 | -5827.7 | 10967.8 | 0.596 | 130.795 | 15827.6 | 0.993 |
| | CFTL | -0.286 | 0.078 | 0.000** | -0.122 | 0.077 | 0.041* | -0.143 | 0.113 | 0.208 |
| Profitability | ROA | -14.470 | 1.617 | 0.000** | -8.222 | 0.538 | 0.000** | -8.434 | 0.775 | 0.000** |
| | GPM | -4.054 | 4.058 | 0.318 | 0.119 | 5.825 | 0.984 | -2.996 | 3.662 | 0.415 |
| | ROE | -31.299 | 8.078 | 0.000** | -19.121 | 5.061 | 0.001** | -21.343 | 4.844 | 0.000** |
| | CFNP | -2.141 | 6.914 | 0.757 | -2.152 | 5.708 | 0.706 | 3.091 | 5.437 | 0.578 |
| Activity | RTA | -0.253 | 0.085 | 0.003** | -0.188 | 0.105 | 0.073 | -0.059 | 0.206 | 0.779 |
| Market Value | PE | 87.116 | 348.369 | 0.049* | -62.032 | 63.911 | 0.000** | -27.788 | 12.542 | 0.000** |
| | PBV | 21 | | | 23 | 423 | .333 | 13.639 | 3.250 | 0.029* |

**p-value is significant at the 0.01 level, *p-value is significant at the 0.05 level

Table 3: The Descriptive Statistics of the Selected Candidate Variables

| Group | Variables | 1 year prior | | | 2 years prior | | | 3 years prior | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | No. of Observation | Mean | Std. Deviation | No. of Observation | Mean | Std. Deviation | No. of Observation |
| Non-Financial Distress | ACGD | 0.623 | 0.676 | 363 | - | - | - | - | - | - |
| | ACAF | 1.397 | 0.641 | 363 | 1.384 | 0.643 | 229 | - | - | - |
| | ACNM | 4.824 | 1.639 | 363 | 4.860 | 1.709 | 229 | 4.900 | 1.692 | 110 |
| | ACPR | 0.678 | 0.391 | 363 | 0.666 | 0.398 | 229 | - | - | - |
| | CACL | - | - | - | 2.719 | 2.654 | 229 | - | - | - |
| | TLTA | 0.389 | 0.187 | 363 | 0.380 | 0.180 | 229 | 0.368 | 0.178 | 110 |
| | CFTL | 0.330 | 0.501 | 363 | 0.387 | 0.433 | 229 | - | - | - |
| | ROA | 7.650 | 8.122 | 363 | 8.768 | 7.192 | 229 | 9.077 | 6.921 | 110 |
| | RTA | 0.951 | 0.575 | 363 | - | - | - | - | - | - |
| | PE | -76.912 | 2485.26 | 363 | 73.217 | 372.019 | 229 | 40.741 | 51.217 | 110 |
| Financial Distress | ACGD | 0.353 | 0.483 | 51 | - | - | - | - | - | - |
| | ACAF | 1.098 | 0.300 | 51 | 1.147 | 0.359 | 34 | - | - | - |
| | ACNM | 6.686 | 3.647 | 51 | 6.647 | 3.642 | 34 | 6.412 | 3.743 | 17 |
| | ACPR | 0.542 | 0.366 | 51 | 0.505 | 0.372 | 34 | - | - | - |
| | CACL | - | - | - | 1.607 | 2.332 | 34 | - | - | - |
| | TLTA | 0.784 | 0.723 | 51 | 0.745 | 0.561 | 34 | 0.691 | 0.371 | 17 |
| | CFTL | 0.043 | 0.652 | 51 | 0.266 | 0.296 | 34 | - | - | - |
| | ROA | -6.820 | 22.047 | 51 | 0.547 | 1.470 | 34 | 0.643 | 1.678 | 17 |
| | RTA | 0.698 | 0.516 | 51 | - | - | - | - | - | - |
| | PE | 10.203 | 15.505 | 51 | 11.185 | 13.618 | 34 | 12.953 | 14.982 | 17 |
| Total | ACGD | 0.589 | 0.661 | 414 | - | - | - | - | - | - |
| | ACAF | 1.360 | 0.617 | 414 | 1.3 54 | 0.618 | 263 | - | - | - |
| | ACNM | 5.053 | 2.084 | 414 | 5.0 91 | 2.138 | 263 | 5.102 | 2.126 | 127 |
| | ACPR | 0.661 | 0.390 | 414 | 0.6 45 | 0.398 | 263 | - | - | - |
| | CACL | - | - | - | 2.5 75 | 2.637 | 263 | - | - | - |
| | TLTA | 0.437 | 0.333 | 414 | 0.427 | 0.288 | 263 | 0.411 | 0.239 | 127 |
| | CFTL | 0.294 | 0.530 | 414 | 0.372 | 0.420 | 263 | - | - | - |
| | ROA | 5.867 | 11.804 | 414 | 7.705 | 7.275 | 263 | 7.948 | 7.079 | 127 |
| | RTA | 0.919 | 0.574 | 414 | - | - | - | - | - | - |
| | PE | -66.181 | 2326.94 | 414 | 65.198 | 347.702 | 263 | 37.022 | 48.867 | 127 |

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Table 4: Logistic Regression Results

| Variables | 1 year prior | | | 2 years prior | | | 3 years prior | | |
|---|---|---|---|---|---|---|---|---|---|
| | ß | Wald | Sig. | ß | Wald | Sig. | ß | Wald | Sig. |
| Constant | -4.137 | 18.184 | 0.000** | -6.197 | 8.102 | 0.004** | -2.680 | 1.682 | 0.195 |
| ACNM | 0.325 | 18.022 | 0.000** | 0.852 | 9.969 | 0.002** | 0.495 | 4.340 | 0.037* |
| ACAF | -1.037 | 3.926 | 0.048** | - | - | - | - | - | - |
| PE | - | - | - | - | - | - | -0.055 | 4.198 | 0.040* |
| ROA | -0.128 | 22.291 | 0.000** | -0.947 | 5.900 | 0.015* | -0.984 | 10.136 | 0.001** |
| RTA | -1.047 | 6.764 | 0.009** | - | - | - | - | - | - |
| TLTA | 2.790 | 14.636 | 0.000** | 4.754 | 4.079 | 0.043* | 5.264 | 4.029 | 0.045* |

**p-value is significant at the 0.01 level, *p-value is significant at the 0.05 level

Table 5: Omnibus Test, Hosmer & Lemeshow Test and Model

| Test | 1 year prior | | | 2 years prior | | | 3 years prior | | |
|---|---|---|---|---|---|---|---|---|---|
| | Chi-square | df | Sig. | Chi-square | df | Sig. | Chi-square | df | Sig. |
| Omnibus | 154.194 | 7 | 0.000** | 165.533 | 5 | 0.000** | 75.334 | 4 | 0.000** |
| Hosmer & Lemeshow | 15.162 | 8 | 0.561 | 0.388 | 8 | 0.982 | 6.925 | 8 | 0.545 |

**p-value is significant at the 0.01 level, *p-value is significant at the 0.05 level

Table 6: Classification table of the model

| Year | Actual | Group Size | Predicted | | %age Correct |
|---|---|---|---|---|---|
| | | | Financial Distress (1) | Non-Financial Distress (0) | |
| 1 Year prior | Financial Distress (1) | 51 | 33 (64.7%) | 18 (35.3%) | 64.7% |
| | Non-Financial Distress (0) | 363 | 3 (0.8%) | 357 (99.2%) | 99.2% |
| | Overall %age | 414 | 36 | 378 | 94.9% |
| 2 Years prior | Financial Distress (1) | 34 | 29 (85.3%) | 5 (14.7%) | 85.3% |
| | Non-Financial Distress (0) | 229 | 4 (1.7%) | 225 (98.3%) | 98.3% |
| | Overall %age | 263 | 33 | 230 | 96.6% |
| 3 Years prior | Financial Distress (1) | 17 | 14 (82.4%) | 3 (17.6%) | 82.4% |
| | Non-Financial Distress (0) | 110 | 2 (1.8%) | 108 (98.2%) | 98.2% |
| | Overall %age | 127 | 16 | 111 | 96.1% |

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# 6.   Discussion and Conclusion

## 6.1   Theoretical Contributions and Implications

This research attempted to examine the impact of audit committee characteristics and financial performance on financial distress and develop the listed companies' financial distress prediction model in the MAI using a binary logistic regression method. The findings suggest that audit committee characteristics and financial performance statistically impact financial distress. The results revealed a negative relationship between the accounting and financial knowledge of the audit committee and the financial hardship of the companies.

This finding supports Rickling (2014) that audit committee members with such expertise may signal due diligence, decrease fraud and ultimately enhance the financial reporting process. By contrast, the results showed a positive association between the frequency of audit committee meetings and the financial distress of the companies. This finding is consistent with Alqatamin (2018) that the frequency of audit committee meetings provides unproductive routine tasks as a fire-fighting device.

Regarding financial performance, this paper's findings indicate that four financial performances are related to the economic hardship of the companies. The results demonstrated that ROA, RTA, and PE have a negative and significant effect on financial distress. Under Ohlson (1980), the likelihood of financial trouble diminishes as ROA rises. Understandably, the poor performance of the invested asset would increase the possibility of financial difficulty. In addition, the data demonstrated that the organizations with a lower RTA ratio did not produce income efficiently from their assets. The result is under Altman (1968).

Moreover, the decline in stock price implies the likelihood of financial trouble, given that stock prices are sensitive to changes in the financial health of organizations. The efficient market theory is further bolstered by the fact that declining stock prices are utilized extensively to identify financially distressed corporations (Trejo Pech et al., 2015). On the other hand, the data indicate that TLTA is a significant predictor of financial trouble. High TLTA is frequently accompanied by increased financial risk, increasing the likelihood of financial difficulty. According to (Geng et al., 2015), the rise in TLTA correlates favorably with financial distress.

In addition, the model accurately predicts financial distress statutes between 94.9 percent and 96.6 percent of the time. This research will contribute to developing a model for predicting financial hardship by incorporating significant elements such as audit committee characteristics and market value ratio. This study's findings demonstrate the acknowledgment of the corporate governance function by examining the audit committee's aspects.

## 6.2   Suggestions for Future Research

Although with a significant theoretical contribution, this study also has some recommendations for ongoing research. The audit committee characteristics and financial performance ratios, considered internal factors, can predict the companies' financial distress. However, external factors might likely positively impact financial distress as well. Therefore, more attention should be focused on the concept of external factors that might predict the companies' financial distress. In addition, additional research could examine the effect of other corporate governance mechanisms on financial distress, including the board of directors, external auditors, and internal auditors. It is likely that other corporate governance mechanisms significantly impact financial distress, which may cause different results from the findings in this research. Adding these factors into the model may get more insightful conclusions in future research.

# References

Aldamen, Husam, Duncan, Keith, Kelly, Simone, McNamara, Ray, & Nagel, Stephan. (2012). Audit committee characteristics and firm performance during the global financial crisis. *Accounting & Finance, 52*(4), 971-1000. doi:https://doi.org/10.1111/j.1467-629X.2011.00447.x

Alifiah, Mohd Norfian. (2014). Prediction of Financial Distress Companies in the Trading and Services Sector in Malaysia Using Macroeconomic Variables. *Procedia - Social and Behavioral Sciences, 129*, 90-98. doi:https://doi.org/10.1016/j.sbspro.2014.03.652

Alqatamin, Rateb Mohammad. (2018). Audit committee effectiveness and company performance: Evidence from Jordan. *Accounting and Finance Research, 7*(2), 48. doi:https://doi.org/10.5430/afr.v7n2

Altman, Edward I, Hotchkiss, Edith, & Wang, Wei. (2019). *Corporate financial distress, restructuring, and bankruptcy: Analyze leveraged finance, distressed debt, and bankruptcy*: John Wiley & Sons.

Altman, Edward I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance, 23*(4), 589-609. doi:https://doi.org/10.2307/2978933

Beaver, William H. (1966). Financial Ratios As Predictors of Failure. *Journal of Accounting Research, 4*, 71-111. doi:https://doi.org/10.2307/2490171

Bhattacharjee, Arnab, & Han, Jie. (2014). Financial distress of Chinese firms: Microeconomic, macroeconomic and institutional influences. *China Economic Review, 30*, 244-262. doi:https://doi.org/10.1016/j.chieco.2014.07.007

Chatchawanchanchanakij, Petcharaporn, Arpornpisal, Chanapong, & Jermsittiparsert, Kittisak. (2019). The role of corporate governance in creating a capable supply chain: A case of Indonesian Tin industry. *International Journal of Supply Chain Management, 8*(3), 854-864.

Chienwattanasook, Krisada, & Jarinto, Krit. (2020). The Impact of International Entrepreneurship On the Internationalization of Thai SMEs: The Mediating Role of Strategic Planning Practices. *Asian Administration & Management Review, 3*(2), 39-52. doi:https://dx.doi.org/10.2139/ssrn.3900524

Chotiyaputta, Veerisa. (2018). Women in the boardroom for better governance management and financial performance. *Asian Administration & Management Review, 1*(1), 32-42. doi:https://dx.doi.org/10.2139/ssrn.3263259

El Keshky, Mogeda El Sayed, Basyouni, Sawzan Sadaqa, & Al Sabban, Abeer Mohammad. (2020). Getting Through COVID-19: The Pandemic's Impact on the Psychology of Sustainability, Quality of Life, and the Global Economy – A Systematic Review. *Frontiers in Psychology, 11*, 1-12. doi:https://doi.org/10.3389/fpsyg.2020.585897

Ellul, Andrew, Erel, Isil, & Rajan, Uday. (2020). The COVID-19 Pandemic Crisis and Corporate Finance. *The Review of Corporate Finance Studies, 9*(3), 421-429. doi:https://doi.org/10.1093/rcfs/cfaa016

Fawzi, Noor Salfizan, Kamaluddin, Amrizah, & Sanusi, Zuraidah Mohd. (2015). Monitoring Distressed Companies through Cash Flow Analysis. *Procedia Economics and Finance, 28*, 136-144. doi:https://doi.org/10.1016/S2212-5671(15)01092-8

Fedorova, Elena, Gilenko, Evgenii, & Dovzhenko, Sergey. (2013). Bankruptcy prediction for Russian companies: Application of combined classifiers. *Expert Systems with*

Impact of Audit Committee and Financial Performance on Financial Distress Prediction: An Empirical Study of The Listed
Companies in The Market for Alternative Investment (Mai)

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*Applications,* *40*(18), 7285-7293. doi:https://doi.org/10.1016/j.eswa.2013.07.032

Geng, Ruibin, Bose, Indranil, & Chen, Xi. (2015). Prediction of financial distress: An empirical study of listed Chinese companies using data mining. *European Journal of Operational Research,* *241*(1), 236-247. doi:https://doi.org/10.1016/j.ejor.2014.08.016

Gunawan, Barbara, & Putra, Hutomo Cahya. (2021). *Determinant of Financial Distress.* Paper presented at the 4th International Conference on Sustainable Innovation 2020-Accounting and Management (ICoSIAMS 2020).

Habib, Ahsan. (2004). Impact of earnings management on value-relevance of accounting information: empirical evidence from Japan. *Managerial Finance, 30*(11), 1-15. doi:https://doi.org/10.1108/03074350410769344

Horak, Jakub, Vrbka, Jaromir, & Suler, Petr. (2020). Support Vector Machine Methods and Artificial Neural Networks Used for the Development of Bankruptcy Prediction Models and their Comparison. *Journal of Risk and Financial Management,* *13*(3), 60. doi:https://doi.org/10.3390/jrfm13030060

Jensen, Michael C., & Meckling, William H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360. doi:https://doi.org/10.1016/0304-405X(76)90026-X

Johnson, Andrew F., Rauhaus, Beth M., & Webb-Farley, Kathryn. (2021). The COVID-19 pandemic: a challenge for US nonprofits' financial stability. *Journal of Public Budgeting, Accounting & Financial Management, 33*(1), 33-46. doi:https://doi.org/10.1108/JPBAFM-06-2020-0076

Klein, April. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics, 33*(3), 375-400. doi:https://doi.org/10.1016/S0165-4101(02)00059-9

Kongsasone, Jumatas, Dampitakse, Kusuma, & Phoprachak, Dararat. (2019). Influence of Corporate Governance Disclosure on Tax Evasion Planning of Listed Company on the Stock Exchange of Thailand. *International Journal of Innovation, Creativity and Change, 7*(1), 300-316.

Kücher, Alexander, Mayr, Stefan, Mitter, Christine, Duller, Christine, & Feldbauer-Durstmüller, Birgit. (2020). Firm age dynamics and causes of corporate bankruptcy: age dependent explanations for business failure. *Review of Managerial Science, 14*(3), 633-661. doi:https://doi.org/10.1007/s11846-018-0303-2

Li, Feng, Abeysekera, Indra, & Ma, Shiguang. (2011). Earnings management and the effect of earnings quality in relation to stress level and bankruptcy level of Chinese listed firms. *Corporate Ownership and Control, 9*(1), 366-391.

Liou, Dah-Kwei, & Smith, MalcolmMalcolm Smith Malcolm. (2007). Macroeconomic Variables and Financial Distress. *Journal of Accounting, Business and Management (JABM), 14*(1), 17-31. doi:http://journal.stie-mce.ac.id/index.php/jabminternational/article/view/292

Lozano, Rodrigo, & Barreiro-Gen, María. (2021). Disrupting the brave new world: COVID-19 effects on organisations' sustainability efforts. *Journal of Organizational Change Management,* *34*(3), 613-628. doi:https://doi.org/10.1108/JOCM-09-2020-0276

McMaster, May, Nettleton, Charlie, Tom, Christeen, Xu, Belanda, Cao, Cheng, & Qiao, Ping. (2020). Risk Management: Rethinking Fashion Supply Chain Management for Multinational Corporations in Light of the COVID-19 Outbreak. *Journal of Risk and Financial Management, 13*(8). doi:10.3390/jrfm13080173

Ohlson, James A. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research,* *18*(1), 109-131. doi:https://doi.org/10.2307/2490395

Pacini, Kevin, Berg, David, Tischer, Thomas, & Johnson, Joe. (2017). An empirical investigation of macroeconomic factors on firm performance in the United Kingdom. *Available at SSRN 3013944.* doi:https://dx.doi.org/10.2139/ssrn.3013944

Pernamasari, Rieke, Purwaningsih, Sri, Tanjung, Juita, & Rahayu, Dewi Puji. (2019). Good corporate governance and prediction of financial distress to stock prices: Atman Z score approach. *International Journal of Economics and Management Studies,* *6*(11), 56-62. doi:http://dx.doi.org/10.14445/23939125/IJEMS-V6I11P107

Piette, Ch, & Zachary, M-D. (2015). Sensitivity to the crisis of SME financing in Belgium. *Economic Review, 3*, 31-45.

Praditsuwan, Nattaya, & Karnreungsiri, Isaree. (2018). Consumer Purchasing Process in Digital Market: A Case Study of Small and Medium Enterprises in Thailand. *Asian Administration & Management Review, 1*(2), 56-70.

Promotion., Office of Small and Medium Enterprise. (2021). SME Annual Situation Report. Bangkok: Office of Small and Medium Enterprise Promotion (OSMEP).

Rafatnia, Ali Akbar, Suresh, A, Ramakrishnan, L, Abdullah, Dewi Fariha Binti, Nodeh, Fazel Mohammadi, & Farajnezhad, Mohammad. (2020). Financial distress prediction across firms. *Journal of Environmental Treatment Techniques, 8*(2), 646-651.

Ranjbar, Samin, & Amanollahi, G. (2018). The effect of financial distress on earnings management and unpredicted net earnings in companies listed on Tehran Stock Exchange. *Management Science Letters, 8*(9), 933-938. doi:https://doi.org/1010.5267/j.msl.2018.6.015

Rickling, Maria. (2014). Audit committee characteristics and repeatedly meeting-beating analyst forecasts. *International Journal of Business, 19*(2), 173.

Shahwan, Tamer Mohamed. (2015). The effects of corporate governance on financial performance and financial distress: evidence from Egypt. *Corporate Governance, 15*(5), 641-662. doi:https://doi.org/10.1108/CG-11-2014-0140

Tinoco, Mario Hernandez , & Wilson, Nick. (2013). Financial distress and bankruptcy prediction among listed companies using accounting, market and macroeconomic variables. *International Review of Financial Analysis, 30*, 394-419. doi:https://doi.org/10.1016/j.irfa.2013.02.013

Trejo Pech, Carlos Omar, Noguera, Magdy, & White, Susan. (2015). Financial ratios used by equity analysts in Mexico and stock returns. *Contaduría y administración, 60*(3), 578-592. doi:https://doi.org/10.1016/j.cya.2015.02.001

v, SET Regulation. (2018). Measure in case of Events that may affect the Listed Companies' Financial Condition and Business Operation. Bangkok: The Stock Exchange of Thailand.