Financial Distress Analysis of Top 100 Malaysian Public Listed Companies during COVID-19 Pandemic using Altman Z-Score Analysis

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ABSTRACT

The outbreaks of the COVID-19 pandemic at the beginning of 2020 have led to considerable economic pressure worldwide, including in Malaysia. The Malaysian government has issued a series of Movement Control Orders (MCOs) requiring companies in most sectors to be closed to the public, with the exception of essential services and certain sectors. The objective of this study is to analyse whether there is a difference in the financial distress of Malaysian companies before and during the COVID-19 pandemic by using the Altman Z-score method. In this study, the annual reports of 83 different companies from 2017 to 2019 and the post-pandemic period (2020-2021) were analysed. This study shows that the global COVID-19 pandemic scenario has a significant impact on the logistics and transport sectors, the consumer goods market, and the manufacturing sector. A significant number of companies have been shaken and are now struggling with difficult circumstances as a direct result of the COVID-19 outbreak. This study also shows that almost half of the companies face the possibility of going bankrupt within this period. Surprisingly, there are companies that seem to have improved their performance despite the widespread COVID-19 epidemic. The findings of this study can provide valuable insights for regulators looking to develop strategies to help listed companies cope with future pandemic-related problems.

Keywords: Covid-19, Financial Distress, Altman Z-Score, Public Listed Companies, Malaysia
JEL Classifications: J01, J08

1. INTRODUCTION

The pandemic of COVID-19, which first appeared at the beginning of the year 2020, has had a severe effect on firms' capacity to maintain their financial stability. According to Astuti et al. (2020), a large number of businesses are now contending with severe financial troubles, the results of which may be seen in decreased sales, increased debt, and cash flow issues. According to Hunter and Shannon 2020, and Wang et al. 2020, the occurrence of this condition may result in the closing of businesses and the filing of bankruptcy by such businesses. The COVID-19 epidemic has not spared Malaysia from any of its devastating repercussions. According to research conducted by the united nations organisation

for industrial development (UNIDO), the COVID-19 epidemic has had a disproportionately negative impact on a number of firms, notably those that are classified as small enterprises. According to the survey, these businesses are dealing with severe difficulties as a direct consequence of the crisis and are likely going to need a longer length of time to recover, which is projected to be between 4 and 6 months.

The COVID-19 epidemic has also led to a large number of companies experiencing financial difficulties. According to Sun and Li (2021), the financial performance of Chinese travel, entertainment, and airline companies has deteriorated significantly during the pandemic compared to other industries. Some of the

companies have not managed to survive the pandemic. Therefore, it is important for companies to anticipate the likelihood of bankruptcy in order to proactively take preventive measures or develop timely strategies to mitigate this risk. This has led to several organisations experiencing financial difficulties. Resource constraints and problems related to the fulfilment of contractual obligations have proven to be prominent obstacles in the ongoing epidemic. In addition, the implementation of containment measures has posed a significant risk to companies. The implementation of containment measures has led to disruptions in global value chains as a result of border closures and restrictions on domestic mobility. It is important to note that regardless of whether businesses export or not, they are all equally impacted by the shortages of intermediate products. As a result, a significant proportion of companies expected their revenue shortages to increase by more than 50% in 2020 compared to 2019. It could be argued that larger organisations, including those listed on the stock exchange, would be in a similar situation (Skvortsova et al., 2020).

Several studies have analysed the increase in financial distress and attributed it to the growth of industrial and commercial projects and the resulting competition (Prasad et al., 2003, Ng, 2012, Khaliq et al., 2014). These studies have also proposed standards and criteria to regulate and support the decision-making processes in these market sectors (Ng, 2012). The phenomenon of globalisation has led to a significant change in the availability and dissemination of information, resulting in an increased need to analyse and manage large amounts of data (Mohammed, 1997). According to Hussain et al. (2014), investors are increasingly using modern technology, economics, management, and accounting to effectively run their organisations. This trend has contributed to the rapid expansion of large, multinational companies. According to Beaver (1966), financial reports are able to effectively differentiate and evaluate the creditworthiness of large organisations. The Altman Z-score was introduced as a measure for assessing the financial distress of companies. Nevertheless, there are few empirical studies on the financial situation of companies in Malaysia.

The aim of this study is to investigate the potential differences in the financial difficulties of companies in Malaysia before and during the COVID-19 epidemic using the Altman Z-Score method. The findings of this study can provide valuable insights for regulators who wish to develop strategies to assist listed companies in coping with future pandemic-related problems, as an unhealthy financial position can be massive and cause long-term distress that can lead to constraints in investment, capital flows, and business performance and subsequently slow down the country's progress towards becoming a developed nation. The following section, referred to as Section 2, provides a comprehensive review of the existing literature on the topic of this study. Section 3 then describes the study design. Section 4 presents the results of the study and the subsequent analysis. The study is concluded in Section 5, the final section.

2. LITERATURE REVIEW

Every stakeholder, but especially investors, should care about a company's ability to stay in business over the long term. Therefore,

business continuity is also considered part of the company's monetary security, which is closely linked to the management's ability to run the company so that it can continue to function. This ability is directly related to the management's ability to run the business so that it can continue to operate (Astuti et al., 2020). However, a company can find itself in financial distress. Financial distress occurs when a company or individual has difficulty generating revenue or income because they are unable to meet their financial obligations or responsibilities (Rahmah and Novianty, 2021). It is a stage of deterioration in a company's financial situation before bankruptcy or liquidation (Purbayati and Afgani, 2020). In Donaldson's seminal 1969 work, financial distress was described as a condition characterised by a lack of financial flexibility. Brigham and Daves (2003) believe that financial distress manifests itself even before a company files for bankruptcy or fails, namely when the company is unable to meet its payment schedule or when projected cash flow indicates that it will not be able to meet its financial obligations.

There are many factors that can lead a company into financial difficulties. One of these factors is ineffective management, which can lead to the failure of a company, which in turn can lead to the bankruptcy of the company. Poor management leads to persistent financial losses, which in turn make it impossible for the company to fulfil its obligations (Fauzia, 2017). This inefficiency is due to wasteful spending, a lack of management skills and competences, and a lack of expertise. When this is the case, there is an imbalance between the amount of debt and the amount of capital. Excessive debt leads to increased interest payments, which in turn reduce profitability and can even lead to losses. Another factor is an excessive level of receivables, which can also lead to financial losses as there are too many unutilized assets that are not earning money. Indicators of a company's financial distress include unfavourable cash flow statements, falling margins and profits, declining sales, increased management stress, and increased staff turnover. According to Newton (1975), a company goes through a sequence of four different stages of deterioration before filing for bankruptcy: Incubation, cash shortage, financial insolvency, and final insolvency. Financial distress can be categorised into four different sub-stages, including performance deterioration, failure, insolvency, and default (Outecheva, 2007). A body of the accounting literature has investigated the phenomenon of financial distress in various companies (Purbayati and Afgani, 2020; Septiani et al., 2021; Rahmah and Novianty, 2021). The aforementioned studies have shown that a decline in performance usually has an impact on the financial viability of a company, with insolvency and default often being attributed to problems with the company's liquidity. Furthermore, a default can be defined as a scenario in which the return on invested capital is permanently well below the rates observed for comparable investments (Altman and Hotchkiss, 2005). The three stages of a financial crisis include profit decline, moderate liquidity, and severe liquidity. Regardless of the stage, it is possible to get into financial difficulties at all stages. Dewing (1952) identifies four factors that contribute to financial difficulties: Increased competition, unproductive growth, a decline in public demand for the company's offerings, and excessive payment of the cost of capital.

Several studies have examined the importance of early diagnosis of financial distress to prevent it from escalating into uncontrollable bankruptcy (Astuti et al., 2020; Rahmah and Ivianti, 2021). There are a number of signs that can be considered symptoms of financial distress that can be perceived by outsiders, such as: (a) a decline in the amount of dividends paid to shareholders over a number of consecutive periods; (b) a consistent decline in earnings to the point where the company is actually losing money. (d) The cessation of operations of one or more business units or their sale. (c) The dismissal of a large number of employees. (a) Prices on the market begin to fall steadily (Astuti et al., 2020). Companies are able to anticipate the likelihood of financial distress through the use of various models such as the Beneish M-score, working capital management, machine learning, and ratio analysis. The study by Habib and Kayani (2022) examines the potential impact of working capital management on the likelihood of financial distress. On the other hand, Halim et al. (2021) use a machine learning model to make predictions about the occurrence of financial distress in companies. The use of this approach has been shown to lead to improved precision in the field of financial distress prediction studies. Other studies have used the Altman Z-score model. For example, Muda et al. (2017) used the Altman Z-score in their study on banking in Malaysia. The study found that Islamic banks have a higher level of resilience to bankruptcy risk compared to conventional banks, especially during economic downturns.

A review of the accounting literature has shown that the Altman Z-score is widely recognised as an excellent model for predicting financial distress. It is a score derived from financial ratios in such a way that the ratio identifies the financial condition of the company in terms of liquidity, profitability, and corporate activities (Astuti et al., 2020). Several studies have used the Altman model as a tool to predict the financial distress of a company (Hussain et al., 2014; Swalih et al., 2021; Moodley et al., 2023; Kumar, 2023; Ikhsan et al., 2024). These studies have shown that the Altman Z-score model has a significant degree of accuracy in predicting corporate insolvencies, with a lead time of up to four years. For example, Babatunde et al. (2017) focused on manufacturing companies in Nigeria. For the current study, a sample of ten manufacturing companies listed on the Nigeria stock exchange (NSE) for the entire 2015 financial year was used. Swalih et al. (2021) conducted an empirical study on the Indian automotive industry using the Z-score model developed by Altman for their study. The results of their study indicate that the automotive industry in India has strong and favourable circumstances.

The Altman Z score was developed as a tool for predicting the financial distress of companies, taking into account five key factors (Rahmah and Novianty, 2021; Salin et al., 2023; Jangjarat et al., 2023; Agutu and Githira, 2023; Alnaa and Matey, 2023), which represent five ratios. Susilowati and Simangunsong (2019) identified the ratios as: i. Working capital to total assets, a type of liquidity ratio that indicates how much net working capital a company has available relative to its total assets to support the company's operations. ii. The ratio of retained earnings to total assets is a measure of the profits that the company has accumulated over the course of its existence. This ratio is also a measure of the company's ability to generate profits from its own operations, using the company's total assets as a basis for comparison. iii. EBIT to total Assets is a measure of how much profit a company generates in relation to the total number of operating assets the company owns. iv. The book value of equity to the book value of total debt is a ratio that can be used to determine how much debt affects the overall decline in the value of a company's assets. v. Sales to total assets is a ratio that can be used to determine how well a company is able to utilise the total assets it has to generate sales.

Altman's Z-score is a quantitative model for predicting insolvency that is widely used in academic and professional circles. It is a formula that can be used to predict the probability that a company will go bankrupt within 2 years. The original work by Professor Edward I. Altman in 1968 was based on data from US companies, mainly from the manufacturing sector (Altman, 2002). However, Altman's Z-score was applied to companies in the US, which raises the question of whether this formula can be applied to companies in other countries, such as Malaysia. There are three reasons to question the applicability of this formula to non-US companies: i. The global economy has changed considerably since Altman's original work. ii. The data for this model is now almost 50 years old. The US economy may not reflect market conditions elsewhere and iii. Industries vary and are not necessarily comparable to manufacturing (the industry used in the development of the original Altman Z-score).

Therefore, a modified version of the formula, the so-called "Z" score, is used for non-US companies. The modified Altman Z-score model uses multiple discriminant analysis (MDA) to analyse several financial ratios simultaneously to assess a company's financial distress (Lord et al., 2020). The Z-score is a statistical technique known as multiple discriminant analysis that incorporates ratios into a multivariate framework (Rim and Roy, 2014). The comparison between the original and modified Altman Z-scores is shown in Table 1.

Where:
A = Working capital/total assets
B = Retained earnings/total assets
C = EBIT/total assets
D = Market value of equity/book value of total liabilities
E = Sales/total assets

3. RESEARCH DESIGN

3.1. Sample Selection
The sample for this study was to consist of the 100 listed companies (in terms of market capitalization) traded on the Bursa Main

Table 1: Original and modified Altman Z-scores

Altman Z score	Formula	Indications
Original: Z-score	Z=1.2A+1.4B +3.3C +0.6D +1.0E	Z >2.99 (Safe zone) 2.99 >Z >1.81 (Grey Zone) Z <1.81 (Distress Zone)
Modified: Z''-Score	Z''=6.56 (A) +3.26 (B) +6.72 (C) +1.05 (D) +3.25	Z >2.6 (Safe zone) 2.6 > Z >1.1 (Grey zone) Z <1.1 (Distress zone)

Market in Malaysia. This decision was made due to the fact that the Main Board has been publicly reprimanded more frequently than other boards in terms of timeliness of financial reporting (Ismail et al., 2012). Since these companies are required to have their financial reports audited by professionals, they were the target group for this study. This requirement played a role in selecting these companies as the target population for this study. (Che-Ahmad and Abidin, 2008; Ren et al., 2024; Yang et al., 2023): According to the companies act of 2016, conducting an audit is a mandatory legal requirement. In addition, Bursa Malaysia requires all companies listed on the stock exchange to submit audited financial statements within four (4) months of the end of their financial year, as stipulated in paragraph 9.23 (b) of the Bursa Malaysia regulations. All companies traded on Bursa must comply with this criterion.

In addition, paragraph 9.23 (a) stipulates that annual reports must be sent to both shareholders and Bursa Malaysia within 6 months of the end of the financial year. This deadline applies to both parties. Krejcie and Morgan (1970) state that the ideal sample size for a population of 100 should be 80 and that a confidence level of 95% should be maintained for the entire study. As a result, 83 of the 100 largest listed companies listed on Bursa Malaysia were considered for this research. However, financial institutions such as banks and other financial institutions were not included.

3.2. Research Instrument and Data Collection

The research instrument in this study is content analysis. The annual revenues of the hundred largest companies serve as the basis for the content analysis, which is based on 5 years of data. The financial data of these companies was acquired from Thomson Reuters and DataStream and divided into two categories: The pre-pandemic period, which covers the years 2017-2019, and the post-pandemic period, which covers the years 2020-2021. During the period in which the data was collected, no information was available for the year 2022.

3.3. Data Analysis

This study performed the panel data on the 400 observations in this study. The Altman Z-score was then computed and tested, using the following formula:

$$\text{Altman Z-Score} = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

Where:
A = Working capital/total assets
B = Retained earnings/total assets
C = Earnings before interest and tax/total assets
D = Market value of equity/total liabilities
E = Sales/total assets

It is becoming increasingly common for analysts to predict the bankruptcy and financial distress of a company (Thai et al., 2014). The Altman Z-score has three classifications, where a higher score indicates that the company has lower financial distress or a higher chance of avoiding bankruptcy, as shown in Table 2.

4. RESULTS

Table 3 shows the results of the calculation of the Z-score value, which is then clarified using the criteria of the modified Altman Z-score model. In the years 2017-2019 (before the COVID-19 pandemic), two companies were classified in the emergency zone. Subsequently, 5 companies were classified in the grey zone and 76 other companies in the safe zone. In 2020-2021 (during the COVID-19 pandemic), three companies were classified in the emergency zone. Then 3 companies are classified in the grey zone and 77 other companies in the safe zone. The results of this calculation show that the number of companies in financial distress has increased. The three companies in financial distress are Air Asia X Bhd, Capital A Bhd, and 7-Eleven Malaysia Bhd, which were heavily affected by the government's movement control order (MCO) during the COVID-19 pandemic. These findings are in line with the research conducted by Rahmah and Novianty (2021), where the results show that companies in the tourism industry have been struggling financially during the COVID-19 pandemic.

Further analyses were conducted to determine whether the Z-score of these companies increased, decreased, or remained unchanged during COVID-19 compared to before the COVID-19 pandemic. As shown in Table 4, 49.4%, or 41 companies, have experienced a decrease in their Z-score, although they are still in the safe zone (Z > 2.6). The sectors where the Z-score has fallen are transport and logistics, consumer goods, and industrial products. These include companies such as Air Asia, 7-Eleven, Malaysia airports holdings Berhad (MAHB), and Malayan cement Bhd. However, there are 33 companies, or 39.8%, that had a better Z-score during the COVID-19 pandemic than before COVID-19. These companies include Top Glove, Astro, Axiata, and Maxis, which belong to the healthcare, energy, and telecommunications sectors. Nine companies, or 10.8%, had no significant Z-score changes in either the pre-COVID-19 period or during the COVID-19 pandemic. These companies are gas Malaysia and IJM corporation, which operate in the utilities and construction sectors. These results are similar to those of the study by Armandani et al. (2021), which shows that companies in Indonesia also experienced financial difficulties during the COVID-19 pandemic.

Table 2: Z-score range

Z-score range	Indications
Z-score <1.8	Distress zone
1.8 <Z-score <3.0	Grey zone
Z-score >3.0	Safe zone

Table 3: Z-score calculation results

Zone	Z-score	Number of companies	
		Before the COVID-19 pandemic (Mean: 2017-2019)	During the COVID-19 pandemic (Mean: 2020-2021)
Safe zone	Z >2.6	76	77
Grey zone	2.6 >Z >1.1	5	3
Distress zone	Z <1.1	2	3
		83	83

Table 4: Analysis of Z-score results

Changes in Z-score	No. companies	%	Sectors	Example companies
Increase (better)	33	39.8	Health care, energy and Telco	Top Glove, Astro, Axiata
Decrease (worsen)	41	49.4	Transportation, industrial products	Air Asia, MAHB, Malayan Cement
No change	9	10.8	Utility and construction	Gas Malaysia, IJM Corporation
	83	100		

5. CONCLUSION

This study examines the possible differences in the financial problems faced by businesses in Malaysia before and after the COVID-19 pandemic to determine whether there were variations or not. This study conducted a content analysis of the annual reports of 83 companies covering the years 2017-2019 and the post-pandemic period, i.e., the years 2020-2021. Using the Altman Z-score approach, this study shows that the global COVID-19 pandemic scenario has a significant impact on the following three industries: Transport and logistics, consumer goods, and industrial goods. As a result of the COVID-19 pandemic, a large number of companies have been shaken up and are going through difficult times. Approximately 49.4% of these companies are at risk of going bankrupt within the next 2 years if no financial adjustments or reorganisation efforts are made, while only about 10.8% of companies are not at risk of bankruptcy. Despite the COVID-19 pandemic, an astonishing 39.8% of companies appear to have improved their performance.

The state that the globe is now experiencing as a result of the COVID-19 epidemic is something that today's industrialised world has never seen before. The current uncertainty around the globe has caused more and more people to postpone investments and defer spending on non-essentials. Look for additional assessment methods outside of the Altman Z-score that can take into account the impact of the global pandemic to assess the state of affected industries and determine whether or not they will be able to continue operating in the future.

This study is without limitations. Firstly, the scope of this study is limited to 100 listed companies. Future studies could expand the scope to a larger sample. Second, this study did not focus on specific industries. Future studies may therefore focus on examining financial distress in specific industries.

To sum up, an unhealthy financial situation can be massive and cause long-term distress, leading to constraints on investment, capital flows, and business performance and consequently slowing down the country's progress towards becoming a developed nation. The results of this study can provide valuable insights for regulators seeking to develop strategies to help listed companies cope with future pandemic-related problems. After all, an unhealthy financial situation can cause long-term distress, which can lead to restrictions on investment, capital flows, and company performance.

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