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**FINANCIAL DISTRESS IDENTIFICATION AMONG  
ENERGY SECTOR COMPANIES LISTED IN BURSA MALAYSIA**

**BY**



**Thesis Submitted to**  
**Othman Yeop Abdullah Graduate School of Business,**  
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**Master of Science in Finance**



**Pusat Pengajian Ekonomi,  
Kewangan dan Perbankan**

SCHOOL OF ECONOMICS, FINANCE, AND BANKING

**Universiti Utara Malaysia**

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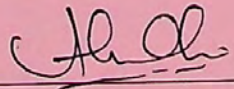
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## ABSTRACT

The main objective of this study is to identify financial distress of Energy Companies listed in Bursa Malaysia. The study indicates a strong significance of the variable in determining financial distress using three different models which is Altman Z-Score Model, Grover Model and Zmijewski Model. The study adopts quantitative research method of secondary source was used to collect data from annual financial report of all the energy companies listed in Bursa Malaysia. The period of study is prior Covid 19 crisis which is from 2016 to 2020. The descriptive and comparative analysis method has been used for the study and this model is developed to compare the independent variables. The descriptive analysis in this study shows that Altman Z-Score model is the most significant model to predict financial failure of the firms. While the comparative analysis shows there is no significant difference between Altman and Grover, Altman and Zmijewski as well as Grover and Zmijewski.

## ABSTRAK

Objektif utama kajian ini adalah untuk mengenal pasti masalah kewangan Syarikat Tenaga yang tersenarai di Bursa Malaysia. Kajian ini menunjukkan pentingnya pemboleh ubah dalam menentukan masalah kewangan dengan menggunakan tiga model berbeza iaitu Altman Z-Score Model, Grover Model dan Zmijewski Model. Kajian ini menggunakan kaedah penyelidikan kuantitatif sumber sekunder yang digunakan untuk mengumpulkan data dari laporan kewangan tahunan semua syarikat tenaga yang tersenarai di Bursa Malaysia. Tempoh kajian adalah sebelum krisis Covid 19 iaitu dari tahun 2016 hingga 2020. Kaedah analisis deskriptif dan perbandingan telah digunakan untuk kajian ini dan model ini dikembangkan untuk membandingkan independent variables. Analisis deskriptif dalam kajian ini menunjukkan bahawa model Altman Z-Score adalah model yang paling signifikan untuk meramalkan kegagalan kewangan syarikat. Walaupun analisis perbandingan menunjukkan tidak ada perbezaan yang signifikan antara Altman dan Grover, Altman dan Zmijewski serta Grover dan Zmijewski.

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# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

This study seeks to determine the early sign or early warning of financial distress of Energy Companies listed in Bursa Malaysia as well as to compare the adoption of bankruptcy models. This chapter focuses on the background of study and the method as well as details on how this research is conducted. In addition, this study also examines the problem statement, research questions, research objectives, significance of study, scope of study, thesis organization and the definition of key terms.

### 1.1 Background of Study

The business world has dramatically changed for the past few years as a result of world economic slowdown which effect the domestic business. In 2020, covid 19 pandemic hit the world and it placed most of the countries under lockdown, as the result, the economic was temporarily paused which caused companies' bankruptcy. According to an article posted by Free Malaysia Today, over 4,000 companies shut down since April in 2020. Rosol Wahid from Deputy Domestic, Trade and Consumer Affairs Minister mentioned that 1,592 of the 4,542 businesses closures took place in June, where the most recorded was from April 1 to July 19.

Gopinath G (2020) stated that the current financial crisis caused by global pandemic at the moment is different from any other financial crisis as it depends on more into the epidemiology of the virus, the effectiveness of containment measures and the vaccines developments. The forecast done by The World Economic Outlook showed that in 2020, the global economic growth would fall to -3 percent as the result of pandemic. It simply indicates the worst recession since the great depression is the great lockdown and it is much worse than the global financial crisis. Many businesses are trembling due to, country lockdown, travel restrictions to contain the virus. As the result, a lot of firms are facing bankruptcy especially retail, travel, and tourism businesses such as AirAsia Japan, Virgin Australia, etc. Therefore, firms need to wisely manage their funds to avoid in getting unhealthy financial state. It could be a massive trouble for the firm which lead to long term distress that might result to the restrictions of investments activities, capital flows and performance of firms.

Bankruptcy is a situation when companies are unable to meet their obligation or having difficulty to pay the creditors. “Bankruptcy”, “insolvency”, “default”, and “failure” are the other common terms used to describe the situation where the firms face financial difficulties (Nur Hafizah, 2015). Financial distress is the situation when a company cannot meet or face difficulty to pay off its financial obligations to the creditors (Khaliq A, et al. 2014). The probability of financial distress in a firm increase due to several causes such as high fixed costs, illiquid assets or the revenue are too sensitive to economic recession.

The awareness to predict firms’ bankruptcy started in 1998 when the financial crisis hit several countries in Asia. Malaysia was one of the countries which was affected by the crisis and as a result, many companies fell into bankruptcy since they failed to meet the obligation to repay the loans. Malaysia’s Central Bank could no longer defend the Ringgit at that time. The value of Malaysia Ringgit depreciated by almost 50 per cent against US Dollar from 2.42 to 4.88 while the composite index of the Kuala Lumpur Stock Exchange (KLSE CI) fell by 44.9 per cent (Ariff M, Abubakar S Y, 1999). The stock market fell to almost 54% while huge numbers of Malaysian companies had to go through restructuring process during the period.

Malaysia was hit by another global financial crisis in 2008. It was considered the worst crisis since 1930. Feridun (2014) mentioned that Malaysian GDP showed the recession trend in the third quarter of 2008, however, it reached negative growth in the first of 2009. Economist pointed out that the cause of global financial crisis in 2008 was mainly due to liquidity crisis in England and house bubble burst in the US (Priewe, J, et al., 2010). Global financial crisis heavily affected many countries in Asia such as Japan, China and India which resulted in their worst GDP growth. Malaysia was affected as well due to its large of scale trading with US and Japan. The real country GDP was 5.9% for the first nine months of 2008, however it fell by 6.2% in the first quarter 2009, it was the first negative growth since 2001 (Ali, I & Hatta, Z, A, 2013). Both financial crisis (1998 and 2008) negatively impacted the price of Petroleum. Asia financial crisis 1998 resulted in the drop in oil price to less than US \$11 per barrel (Bakhtyar et al., 2012). The oil price drop extended the financial crisis for oil producers.

According to Ismail, W. A., Ahmad, R. A., Kamarudin, K. A., and Yahaya, R. (2005), financial distress is defined by Bursa Malaysia as the companies which are categorized under PN17 and GN3 Main and Ace market respectively in Malaysian context. According to [klse.i3investor.com](http://klse.i3investor.com), there are few criterias for companies to be classified under Practice Note 17: companies' shareholders' funds are less than 25% of their total paid up capital; the appointed receivers take a full control of the companies assets; terminate the subsidiaries and associated companies; adverse audit reports on the companies are released: failed in meeting obligation to pay loan interest and principal payments; the companies have stopped and suspender the operations, and companies do not have any significant businesses or operations.

The study on bankruptcy factors and predictions is an important topic in Finance. The financial failure prediction analysis which is done accurately and on timely manner is very important to stakeholders including managers, the government, suppliers, customers, and employees to take the necessary actions to aver or avoid a potential bankruptcy (Byrne & Barron, 1993). Predicting and forecasting firms' financial distress attracts the attention of financial experts as it provides early signal and warning of corporate failure. Financial health through financial analysis is the focus to predict bankruptcy in the earlier studies. Therefore, this study focuses on three different financial distress models to predict firms' financial failures.

## **1.2 Problem Statement**

Referring to Global Financial Crisis in 2008, many public listed companies suffered with financial distress and ended up with bankruptcy due to liquidity issues and struggled to acquire external funding which turned insolvent (Imbs, 2010). As a result, corporate management concern more on the appropriate level of debt and equity as capital structure since it has an influence towards firms' performance. According to Brealey et al. (2008), higher leverage firms are more vulnerable for bankruptcy when the stock market collapsed in 2008. However, Bei & Wijerwardana (2012) stated that financial leverage provides additional funds to the company and as a result, it helps the company to improve its growth. While Kristanti, et al. (2016) stated that higher leverage firms would increase the financial distress risk. Bhamra et al. (2010) mentioned that the firms have concerned more about financial stability and more conservative on their financial policies to fight against unexpected financial crisis. As a result, debt to equity ratio has become an important survival indicator (Campello et al. 2010).

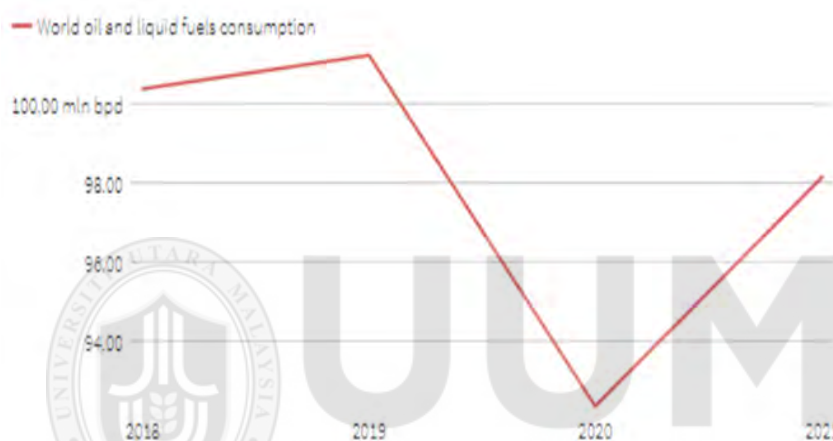
Besides, Hanafi and Abdul Halim (2009; 202) mentioned that current ratio is one of indicator

to avoid financial distress. The formula of this ratio is by dividing current asset and current liabilities. This ratio indicates how much cash that a company owns, and all the asset that can be converted to cash within a year, compare to its total liabilities that will mature in short term (not more than 1 year), therefore, the higher the current ratio is, the more capable the company is to pay its obligations. Additionally, Brindescu, D (2016) stated that profitability is the main factor for cash generation. High profitability ratio is expected to impact positively towards cash flow, and it contributes to avoid payment defaults and bankruptcy in particular. High profit generally leads to equity increased and thus, are associated with autonomy ratio and high equity working capital.

Covid 19 is creating an insolvency time bomb, and the report from Euler Hermes (2020) predicts that 35% of cumulative increase in the number of companies which go bust between 2019 to 2021. According to Hoo E (2020), the businesses in Asia Pacific region are facing the highest insolvencies in 2020 at 4.2%. It is mainly due to corporate debt in Asia with the amount of SU\$32 trillion resulted by coronavirus pandemic reported by the Financial Times (2020). Additionally, millions of people have suffered from Covid 19 and subsequently, it created demand, supply, and financial shock all at once to the world (Triggs and Kharas,2020). The pandemic has led to serious damage on the economic, mainly due to fall in demand. It simply means, there was a significant decrease in purchasing power of consumers since majority of the countries placed travel or movement restrictions to contain the virus. Consequently, many business sectors or industries were not able to generate profit and they were severely impacted such as travel and tourism, retails, automotive, oil and gas, etc.

These companies needed to undergo massive cutting cost, as a result, retrenchment or lay off was one of the save-cost strategy as it helped the companies to lower their operating cost, and unemployment worsen the economic condition since those impacted workers (consumers) were no longer able to afford to purchase unaffected goods and services. According to an analysis by S&P Global Market Intelligence, a total of 630 companies filed bankruptcy in 2020 and it is the worst corporate bankruptcies level in the US in 10 years as the impact of Covid 19 pandemic. The World Bank stated businesses would face heavy challenge in obtaining service debt to heighten risk aversion which could lead to the rise of borrowing costs, and the risk of defaults and bankruptcies could result in financial crisis in many countries. The World Bank concluded in the worst scenario; the global economic growth might shrink by almost 8% in 2020.

One of the business sectors which hammered badly by the virus outbreak is the energy sector business. Perhaps, among all the industries, energy sector was dramatically affected by global pandemic (Oxford Business Group, 2020). Ambrose J (2020) stated that the pandemic has forced the crude oil price to go negative for the first time in history as stockpiles overwhelmed the storage facilities. The World Bank (2020) added a collapse in oil demand and crash in oil prices have been triggered by the pandemic and an effort to contain the virus. The oil producers ran out of storage spaces due to oversupply caused by the pandemic crisis, as the result, the oil producers forced to pay the oil buyers to take the barrels which were unable to store. The movement restrictions or country lockdown to contain the virus are the main reason of oil price slumps as jets, cars are grounded, and factories are side-lined.



*Global crude and liquid fuels consumption  
(Source: US Energy Information Administration)*

The energy sector companies might face financial challenges as the price slump and lower in demand will lead to the decline in companies' revenue which might lead to potential financial distress or bankruptcies for those who are at risk, yet unable to refinance the debt or meet their obligations to repay the debt. According to an article released by Oxford Business Group, the slump in energy demand negatively influenced the confidence of investors as there was a drastic fall in investment in the sector. The report forecasts that oil, coal and gas investment will drop by 8.5 percent, 6.7 percent and 3.3 percent respectively. According to Epiq (2020), a total of 53 energy companies have sought for bankruptcy protection as the result of the pandemic and these companies were already struggling with high debt.

According to Wallach, O. (2020), 2020 has been a disaster for energy companies since the growing wave of energy bankruptcies started to increase. There were 18 bankruptcies case in the second quarter of 2020 among oil and gas producers which was the highest quarterly since 2016. Apart from that, one of the major failure reasons for these companies are due to huge



debt. Huge portion of the debt starting to expire, and it becomes difficult to pay off their obligations especially during current market conditions. According to the data listed in Practice Note 17 (PN 17) in Bursa Malaysia, there are total four energy sector companies registered. It simply shows how vulnerable energy sector companies especially during financial crisis as well as during the pandemic.

The prediction of financial distress is one of the most important issues in corporate finance. The main objectives are to present the firms to either file for bankruptcy or not. There are various bankruptcy prediction model where these models use different ratios to predict financial distress. However, in this paper, three financial distress prediction were chosen which is, Altman, Grover and Zmijewski model. This study intends to analyse the difference of these models as well as the comparison among the three models.

Altman Z-score model is a common method used to identify the firms' financial failure. Pakdaman, H (2018), stated that Altman was the first multivariate bankruptcy model. Altman used multiple differentiation analysis method (MDA) combined with financial ratios as independent variables. Among 22 financial ratios, Altman chose 5 the best ratios to predict financial failure. Another common model used to predict financial failure is Grover Model. This method was found by Jeffrey S. Grover by modifying which is reassessing and designing the Altman Z score model. 13 new financial ratios were added in this study while the samples were taken according to Altman Z-score model in 1968 (Saragih, F., Sinambela, E., & Sari, E. N. 2018). While the third common model used to predict financial distress is Zmijewski Model. Zmijewski came up with his own model due to his critics towards the previous model or sampling model used by his predecessors. Zmijewski uses leverage, liquidity and performance ratios to present a suitable model (Zmijewski, 1984).

Many researchers have agreed that these three financial failure models can be used to predict financial distress of the firms. Khaliq, A, et al (2014) on their study found out that Altman Z Score model measurement can be used to identify between non-financial distressed and financial distressed companies. A research conducted by Ni Made Evi Dwi Prihanthini, et al., (2013) found that the Grover model is the most accurate and appropriate model to predict financial failure on food and beverages sector companies listed in Indonesia Stock Exchange (IDX). Husein & Pambekti (2014) used listed Syariah firms for the period 2009 – 2012 with 132 sample proves that Zmijewski model is able to predict corporate financial failure very accurately.

However, based on the comparative research conducted previously, there are various result in these three model differences. Hertina, Kusmayadi, & Yulaeha (2020), mentioned there was a significant difference between Altman Z-Score model and Grover model. The result is also significant with the test conducted for Grover model and Zmijewski model where there was a significant difference in these two models. According to Tanjung (2020), based on comparative analysis test for both Altman and Zmijewski model, the result showed there was a significant difference in the analysis results of financial distress between these two models. However, Abadi (2017), mentioned in his research on property sector companies between 2013 to 2014 that the financial ratios used for Zmijewski model calculation are non-significant in predicting corporate's financial failure. Based on this information, this research aims to compare if there is a significant difference between Altman Z-Score Model, Grover G-Score Model, and Zmijewski X-Score Model.

### **1.3 Research Question**

The following research questions are formulated for this study:

1. Is there any significant difference between Altman Z-score model and Grover model analysis in determining financial distress among energy sector companies listed in Bursa Malaysia?
2. Is there any significant difference between Altman Z-score model and Zmijewski model analysis in determining financial distress among energy sector companies listed in Bursa Malaysia?
3. Is there any significant difference between Grover model and Zmijewski model analysis in determining financial distress among energy sector companies listed in Bursa Malaysia?

### **1.4 Research Objectives**

The general objectives of this study is to compare the three financial failure models in determining financial distress of all energy companies listed in Bursa Malaysia.

The research objectives of the study are based on the research question above

1. To compare if there is any significant difference between Altman Z-score model and Grover model in determining financial distress of energy sector companies listed in Bursa Malaysia.
2. To compare if there is any significant difference between Altman Z-score model and Zmijewski model in determining financial distress of energy sector companies listed in Bursa Malaysia.
3. To compare if there is any significant difference between Grover model and Zmijewski model in determining financial distress of energy sector companies listed in Bursa Malaysia.

### **1.5 Scope of Study**

The scope of this study as follows:

1. This study uses the data of 30 energy sector companies including 4 PN17 companies listed in Bursa Malaysia.
2. This study uses three different financial distress model which is Altman Z Score model, Grover model and Zmijewski model in determining financial health as well as the financial performance of the companies.

### **1.6 Significance of the Study**

Comparing to previous study, this study focuses on the most important ratio to predict bankruptcy which is liquidity ratio, leverage ratio and profitability ratio. Besides that, this study aims to identify financial health of all energy companies listed in Bursa Malaysia.

1. This study would guide and encourage universities student to find out and explore more models to be used as financial failure prediction.
2. This study can be used as guidance for financial analysts of the firms to predict the bankruptcy especially during unexpected event such as Covid 19 pandemic so that they are aware how to utilize funds effectively and efficiently.
3. This study would provide deep insight for investors before making investment decision on particular companies.

4. This study would be beneficial for policy makers and the government agencies in constructing the right economic policy for the businesses.

## **1.7 Research Organization**

This research consists of five chapters as follows:

1. Chapter one gives an overview of this research, it consists of introduction, background of study, problem statement research question, research objective, scope, and significance of the study.
2. Chapter two provides the Literature Review of existing literature related to this study. The purpose of review is to explain and provide a literature gaps overview of this study and how this the work undertaken will contribute to the research.
3. Chapter three explains the methodology used in this study. The topics covers include research framework, research hypotheses, sampling, data collections as well as and the method or the technique of data analysis.
4. Chapter four provides data analysis and findings explanations, data collection and data analysis, as well as results are presented.
5. Finally, chapter five covers the discussion, conclusion and recommendations of this research works.

## **1.8 Definition of Key Terms**

- Financial Distress: It is a condition in which a company or individual cannot generate sufficient revenues or income, making it unable to meet or pay its financial obligations (Adam Hayes, 2020).
- Bankruptcy: It is a legal proceeding involving a person or business that is unable to repay their outstanding debts (Tuovila A & Brock T, 2020).

- Altman Z-score: The Altman Z-score is the output of a credit-strength test that gauges a publicly traded manufacturing company's likelihood of bankruptcy. The Altman Z-score is based on five financial ratios that can calculate from data found on a company's annual 10-K report (Kenton W & James M, 2020).
- Profitability ratio: It is a class of financial metrics that are used to assess a business's ability to generate earnings relative to its revenue, operating costs, balance sheet assets, or shareholders' equity over time, using data from a specific point in time (Kenton W & James M, 2020).
- Liquidity ratio: It is an important class of financial metrics used to determine a debtor's ability to pay off current debt obligations without raising external capital (Adam Hayes, 2020).
- Leverage ratio: It is any one of several financial measurements that look at how much capital comes in the form of debt (loans) or assesses the ability of a company to meet its financial obligations. The leverage ratio category is important because companies rely on a mixture of equity and debt to finance their operations, and knowing the amount of debt held by a company is useful in evaluating whether it can pay off its debts as they come due (Adam Hates, 2020).

## CHAPTER 2

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter provides literature review which discuss the background knowledge on the research work undertaken. This research emphasizes financial ratios analysis methods and financial distress prediction models used to determine corporates' financial failure as well as the few bankruptcy theory related to this study.

#### 2.1 Energy Sector Companies

The energy sector companies have been facing very difficult and unprecedented challenges due to the oil and price slump caused by Covid 19 pandemic. According to an article posted by Shearman & Sterling (2020), there are more than 20 oil and gas producers filed the bankruptcy this year. Weizhen Tan (2020) added that the situation is worsened as new investments are unlikely to flow in. Energy investments face new risks from both a funding – i.e. how well project revenues and earnings can support new expenditures on corporate balance sheets – as well as a financing perspective – i.e. how well debt and equity can be raised to supplement corporate and government funds. Ben Luckock during the APPEC conference mentioned because of the fall in oil prices and corporate valuations, capital expenditure in exploration and production (E&P) companies in the energy sector have plummeted. Such companies are involved in the early stages of energy production, which includes searching and extracting oil and gas. Bill Holland (2021) concluded that as financing conditions quickly become much less accommodative due to risk aversion from investors uncertain about the global impact of Covid-19, the energy sector companies may continue to see an increase in distressed debt instruments, followed by an increase in defaults.

#### 2.2 Financial Distress Models

There are various models in determining corporate's financial failure. However, this study focuses on three bankruptcy models:

### 2.2.1 Altman Z Score Model

The early study in predicting financial distress and the usefulness of accounting information to predict bankruptcy was first studied by Beaver (1966). Corporate financial distress defined by Beaver as the failure of a company to meet its overdue financial obligation. According to him, financial distress is categorised in different forms such as bankruptcy, default on bond and preferred stock as well as overdrawn bank account. He stated that the financial ratios' differences between bankrupt firms and non-bankrupt firms is the cash flow-to-debt ratio although different ratios will provide different levels of success in predicting the bankruptcy, and the financial ratios are significantly useful to deliver information and signal against the financial conditions of firms well before the bankruptcy. The results simply showed few factors or causes of distressed firms prior to failure, including a slump in net income, cash flow, and working capital, as well as an increase in total debt. According to Piesse J, et al. (2006), this model was useful in the beginning, univariate analysis was later found to be limited and better results were obtained from combining a number of ratios to provide a stronger model with improved accuracy or higher predictive power.

Altman (1968) added that financial ratios must be significantly different between bankrupt firms and non-bankrupt firms. He developed a multivariate model which contains five ratios: Profitability, liquidity, solvency, leverage and activity ratio. He also concluded that there are four primary factors to predict the bankruptcy possibility before the actual failure, and the three of four factors are the total liability-to-total asset ratio, the net income-to-total asset ratio, and the working capital-to-total asset ratio. Therefore, Altman uses broaden technique to predict financial failure of the firms by focusing on the several indicators of financial ratios.

$X_1 = \text{Working Capital} / \text{Total Assets}$

$X_2 = \text{Retained Earnings} / \text{Total Assets}$

$X_3 = \text{Earnings Before Interest and Taxes} / \text{Total Assets}$

$X_4 = \text{Market Value of Equity} / \text{Book Value of Debt}$

$X_5 = \text{Sales} / \text{Total Assets}$

Altman (1968) employs multiple discriminant analysis (MDA) which determines the discriminant coefficient of each of the characteristics chosen in the model on the basis that these will discriminate efficiently between failed and non-failed firms. MDA is also used to determine the Z-score, a widely used measure for predicting bankruptcy. The discriminant

analysis goal is to generate a linear combination of variables which is used to separate the bankrupt companies from the non-bankrupt ones. Piesse J, et al. (2006) concluded, because of the success of the Z-score in predicting failure, 22 selected financial ratios were classified into five bankruptcy-related categories. 33 bankrupt and 33 non-bankrupt manufacturing companies sample ranging between 1946 and 1965 were used, and the five variables are determined as final specification model, which are still frequently used in the banking and business sectors. According to Moyer (1977), there are no further studies which have provided adequately improved results to render the Altman model obsolete and in need of adaptations. Edmister (1972) stated the predictive power of ratios is cumulative, which means the predictive ability increases with successive additions of other ratios. Whereas, these additional ratios will only add power to the predictive accuracy whether they are really relevant, significant, and do not overlap other ratios.

Altman Z score has been used and tested in various academic research and the outcomes model is precise and dependable, and is still widely used to determine financial distress although various models or theories developments have been done for the past thirty years (Agarwal and Taffler, 2007; Carstea et al., 2010). A comparative analysis of three different methods which consist of the hazard model, multiple discriminant analysis (MDA), and the logistic regression was conducted to track financial distress firms. According to Sasongko, et al. (2015), there are differences in classification in predicting financial distress between the Altman model and the Grover model. Yulaeha et al. (2020) also added that there was a significant difference between Altman Z-Score model and Grover model in determining financial distress among the coal subsector mining companies listed in Indonesia Stock Exchange.

### **2.2.2 The Grover Method**

Bankruptcy analysis is carried out to obtain early sign or warning of financial failure of company. And generally, the sign of bankruptcy can be detected through financial statements (Dewi Anggraini, 2017). The earlier a company in recognizing signs of financial failure, the better it is for the managements to make improvements. Therefore, bankruptcy analysis or method is used to find out a situation or condition whether the company will go bankrupt or not.

One of the models used to predict bankruptcy is the Grover Model or Method. This method was created by Jeffrey S. Grover (2001) by designing and reassessing the Altman Z-Score



Method. Jeffery S. Grover (2001) constructed his bankruptcy prediction model by using samples according to Altman Z-Score model in 1968 and added 13 new financial ratios. Therefore, the total sample used was 70 companies with 35 financial distress companies while another 35 companies were financially healthy from 1982 to 1996.

The Grover Model uses few ratios in predicting bankruptcy such as:

- a. Working Capital to Total Assets
- b. Earnings Before Interest and Tax
- c. Return on Assets (ROA)

The data are taken from financial statements. According to Puspitasari (2018), financial statements are normally used for public as a form of accountability to monitor the performance and to evaluate the management, to observe the trends between time periods, the achievement of stated goals and to compare the performance from another similar organizations and to allow outsiders to obtain cost information goods and services received and to assess the efficiency and effectiveness of the use of organizational resources.

Based on the comparative analysis from previous research, According to Sasongko, et al. (2015), there are no classifications in predicting financial distress between the Grover model and the Zmijewski model. Meita (2015) also concluded that Altman Z-Score model and the Zmijewski model is a bankruptcy prediction model that gives the same high value in predicting bankruptcy in coal mining companies. However, Yulaeha et al. (2020) concluded that there was a significant difference between Grover model and Zmijewski model in determining financial distress among the coal subsector mining companies listed in Indonesia Stock Exchange.

### **2.2.3 The Zmijewski Model**

Zmijewski (1984) came up with his own model due to dissatisfaction of previous model done by his predecessors. He criticized matched-pair sampling techniques since the model tend to provide bias in the results. Hence, Zmijewski (1984) uses random sampling techniques in his research. This model requires one crucial thing which is the sample and population proportions must be determined at the earliest to obtain the frequency of financial distressed. This frequency is basically obtained by dividing the number of samples which experience financial distress to the total sample size. Zmijewski model used total sample of 840 companies,

consisting of 800 financially healthy companies and 40 financial distressed companies. He collected the data from 1972-1978 and the data was collected from the Compustat Annual Industrial File. The statistical model used by Zmijewski model is similar as used by Ohlson namely logit regression. Therefore, these are the ratios used by Zmijewski model:

- ROA (Net Income / Total Assets)
- Leverage (Total Debt / Total Assets)
- Liquidity (Current Assets / Current Liabilities)

The comparative analysis was conducted by previous studies shows that there are differences between the Altman Z-Score and Zmijewski models (Dimas, 2017). Tanjung, P. R. (2020) also concluded that there is significant difference between Altman Z-Score and Zmijewski model in predicting bankruptcy of Manufacturing Sub-Sector Companies. However, Fairuz's (2016) stated that Altman Z-Score model and Zmijewski model had no significant difference in determining financial failure of the firms.

## **2.3 Financial Ratios**

There are various definitions about financial ratio. According to Carlson, R (2019) on her article from the balance small business website, she mentioned that financial ratios are created with the use of numerical value taken from financial statements to gain meaningful information about the company. She also added financial ratios are useful tools that help companies and investors analyse and compare relationships between different pieces of financial information across an individual company's history, an industry, or an entire business sector. The numbers are taken from firm's income statement, balance sheet, and cash flow statement allow analysts to calculate several types of financial ratios for different kinds of business intelligence and information. Financial analysts tend to use ratios in order to evaluate corporate performance including profitability, liquidity, and solvency, as well as the efficiency of management in the design and implementation of funding policies and investment (Mohammed, 1997). Hence, the main focus ratios selected to identify firms' financial risk in this study are Liquidity Ratio, Leverage Ratio, and Profitability Ratio.

### **2.3.1 Liquidity Ratio**

Altman and Hochkiss (2006) explained four basic bankruptcy terms, insolvency, default and failure which are used by various researchers differently. A term of technical insolvency is a condition where a company is not able to to meet its current obligations due to liquidity. Whereas

bankruptcy itself is a formal declaration issued by court because of a petition for bankruptcy reorganization or assets liquidation. A literature that supports corporate financial failure using financial ratio has been established as an early warning or sign for the firm to be restructured in order to avoid bankruptcy. This is because the systematic effect of firm size and industry effects can be controlled by using financial performance data (Lev and Sunder, 1979, pp.187-188) in cross-section models to identify whether there are signs of companies' failure. Mohammad et al., (2012) mentioned it is very important to utilize financial ratios in financial analysis and its role and its importance to evaluate the companies' performance and also for financial failure calculation of companies through the number of companies practical application as well as to use the graph to display the results, in order to avoid failure and face global financial crisis.

Operating cash flow of the company is playing a pivot role of determining firms' financial distress and it is generated by assets that will affect continuing firms' liquidity which is not only because of the liquidation value (Soenen, 1993) and, one of the method to determine liquidity in business organization is by using ratio analysis which is current ratio. According to Mohammed A B E, and Soon N K (2012), current ratio is a financial liquidity indicator that measures whether or not a firm has enough resources to issue a payment against its debts over the next 12 months, and this ratio is to compare the company's current assets to its current liabilities. According to Horne and Wachowicz (2000), current assets of the firms must be at the right portion because firms with fewer current assets will have problem in continuing their operations while if the company has too much current assets, it simply shows the return on investment is not in a perfect condition. It means short-term creditors may prefer high current ratio since it reduces risks while shareholders may prefer a lower current ratio so that more of the firm's assets are working to grow the business. The current ratio typical values are vary from firm and industry, for instance, firms in cyclical industries may need to maintain a higher current ratio in order to stay solvent during downturns, which should be  $\text{Current Assets over Current Liabilities}$  (Ali, 2008; Mahmood et al., 2009).

Liquidity ratio plays an important role for financial distress prediction. Maintaining a good level of liquidity may help the companies in conducting its day to day business operations smoothly. Liquidity can play significant role on business performance especially it can significantly influence the cash flow of the business (Gitman, 2006). It can be used as precautionary measure especially during liquidity crisis or credit crunch faced by the firms.

### **2.3.2 Leverage Ratio**

According to Dambolena and Khoury (1980), one of the best predictors in discriminant function or corporate financial risk is leverage ratio. According to Lakshan and Wijekoon (2013), leverage ratio calculation is a comparison of company's total debt to its total assets, which is used to obtain a general idea as to the amount of debts being used by a firm. According to Adilah Irdahwani, (2018) the ratio is a gauge to what extend the business is holding its earnings and utilizing it to buy assets instead of paying out dividends and acquire debt and new capital to finance its business activities. A low ratio percentage indicates the company is less dependent on leverage, i.e., money owed to or borrowed from others. Lower ratio percentage tells that the company is using the leverage which means its equity is in stronger position. The higher the ratio in general indicates the riskier that a firm is considered to have taken on. Bowen, Daley & Huber (1982) reported that firms are likely to shift closely to their industry mean leverage level because this level is believed to be a valid proxy for an optimum leverage level. Finally, according to Beaver (1966), debt ratio was considered to be one of the six best predictors of corporate failure or bankruptcy based on univariate analysis.

### **2.3.3 Profitability Ratio**

According to Adilah Irdahwani (2018), profitability ratio act as a measurement to measure the firm ability to earn adequate earnings using its resources. The earnings which is derived from net operating income to total asset is used to estimate the firms' efficiency in utilizing the assets to generate earnings before interest and taxes. Fumani M and Moghadam A (2015) mentioned the extreme survival of a firm is based on the profitability of its business. In fact, the profitability ratios indicate how well a firm has operated during the fiscal year. Fumani M and Moghadam A added that a profitable firm is likely to have a high tax burden and low cost of bankruptcy. Therefore, profitable firms have more capability of being indebted since they have greater position to pay off the debt on time.

According to study conducted by Duan J-C and Sun J, Wang T (2012), there is a significant relationship between profitability and financial distress. The results of their study suggested that financial distress intensities strongly decrease the level of profitability for all prediction horizons considered. While according to Aghaie A and Saeedi A (2009), higher profitability makes higher efficiency and better liquidity, hence lowering default risk. Moreover, a firm with good profitability increases the confidence of creditors or investors since the interest expenses in the firm can be achievable. Hence, the higher the ratio indicates that the firm efficiently

generates the earnings by utilizing its total assets and vice versa. According to Fraser & Ormiston (2004), profitability ratios provides the comprehensive measurement on firm's performance and its efficiency of managing assets, liabilities and equity.

## **2.4 Bankruptcy Theory**

The Bankruptcy occurs when firms are unable to pay the debts, as a result, they have very limited options for the future. One of the options could be filing a bankruptcy, or in legal term is freeing process for a company towards its debts and other obligations while giving the creditors an opportunity for repayment. Bankruptcy could generally give a fresh start for the firms.

### **2.4.1 Signalling Theory**

According to Wolk et al. (2001), signalling theory reveals the signals to the users through financial statements in the form of positive signals (good news) and negative signals (bad news). According to Watts (2003), signalling theory emphasizes the necessity of information given by the company's management to the investor as well as other stakeholders about the prospects of the company so that the investors are able to provide feedback on the information. Besley and Brigham (2008) added that signals is an action taken by the management to the investors on how they view the prospects of the company. Therefore, the investors will obtain important information or data from the management as piece of transparency for the decision making.

Wiratmaja et al. (2020) mentioned that signalling theory provides vital information from the management which is written in the form of financial statements which is normally used by investors to determine or identify the company's performance. Therefore, this information gives signal to the investors about the things which have been done by the agent to realize the objectives of principals to showcase the performance comparison with the competitors. Sunyoto (2013) stated that financial statements are process of assessment and analysis which help in answering questing as a means to an end. Financial statements are very important for everyone since all the information inside can be used to determine performance and financial condition of the company, it also can be used to predict the potential of bankruptcy.

## **2.4.2 The Modigliani-Miller Theory**

The Modigliani-Miller Theory is known as MM Theory, which is normally used in financial and economic studies to identify and analyze the values of different companies. The theory says, the value of a company relies on its ability to obtain revenue, as well as the risk of its underlying assets and is free of how it distributes its profits and how its operations are financed (Merton, 1974).

As indicated by this theory, organizations that use debt financing are more important than the companies that finance themselves simply with equity. There is tax advantage associate with debt financing to manage the operations. Deducting the interest on the debt, decrease the tax liability and increase the profits can be achieved by those that rely on debt financing than for those who solely rely on equity (Modigliani & Miller, 1958).

However, the theory added that higher cost of capital may increase the risk of bankruptcy. As the organization adds more obligation or debt to its capital structure, the organization's WACC increments past the ideal level where it could increase bankruptcy cost. Bankruptcy may arise when the company or organization fail or default to pay its obligations due to the increase of its debt financing rather than using the equity. Therefore, there should be equal distribution between debt financing and equity financing in order to get tax benefit and to avoid any payment default.

## **2.4.3 Trade-Off Theory**

According to Myres (1984), this theory reveals the organizations can get the optimal leverage by three determinants including charges of financial distress, taxes and agency costs. Additionally, the companies may borrow up until the tax reductions precisely equal to the costs that come from the increase chance of financial insolvency or distressed. In which prescribed the companies to set their target to debt to equity ratio as well as moving to achieving towards it. If the optimal capital structure proceeds, the company, as the result, the company value will increase. Baxter (1967) argued that the possibility of bankruptcy increases when the companies increase debts or leverage. In which, the companies should not utilize debt surpassing to the point where the debt is higher than tax benefits. In spite of Kraus and Litzenberger (1973) claimed that if the profit of the firms is much lower than the associated debts, it indicates that the market value of the firms is significantly resonation with its obligations or debts. The trade-off theory also states that the increase amount of debt could potentially increase the company

insolvency, somewhat offsetting the decrease in the WACC. Therefore, the theory suggests a mix of debts and equities as capital structure is very important to mitigate the risk of default.



## CHAPTER 3

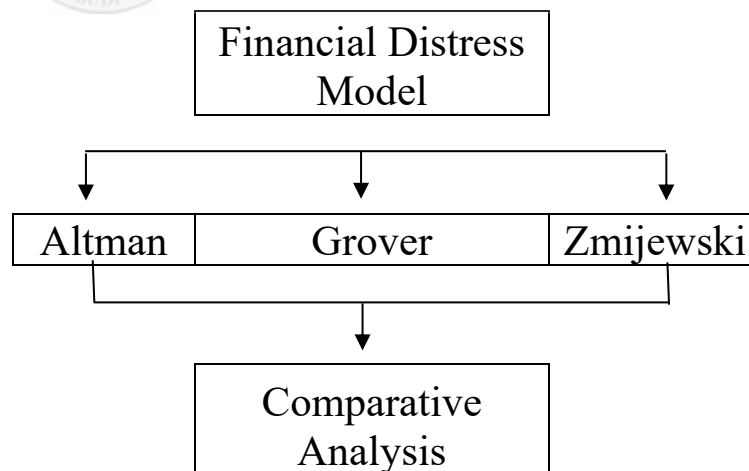
### METHODOLOGY

#### 3.0 Introduction

This chapter highlights the underpinning theory hypothesis development as well as the research framework. This study focuses on the analytical method by conducting the statistical analysis of the independent variables related to the subject of the study. Besides, it will explore the financial position of Energy companies listed in bursa Malaysia. Quantitative research methodology is used with empirical study in this paper. According to Leedy and Ormrod (2001), quantitative research is a method to answer questions about the relationships or correlations among measured variables with the intention of explaining, predicting, and controlling phenomena.

#### 3.1 Research Framework

The framework of this research is conducted using comparative analysis using independent variables of the three-financial distress methods:





### **3.2 Hypothesis**

The following hypothesis are developed to test the difference between Altman Z-score model, Grover model and Zmijewski model in determining financial distress among energy companies listed in Bursa Malaysia. Hence, the hypothesis are as follows:

**H<sub>1</sub>**. There is a significant difference between of Altman Z-score model and Grover model in determining financial distress among energy sector companies listed in Bursa Malaysia.

**H<sub>2</sub>**. There is a significant difference between of Altman Z-score model and Zmijewski model in determining financial distress among energy sector companies listed in Bursa Malaysia.

**H<sub>3</sub>**. There is a significant difference between of Grover model and Zmijewski model in determining financial distress among energy sector companies listed in Bursa Malaysia.

### **3.3 Data Collection**

This study uses the secondary data in the form of financial report generated from listed firms in Bursa Malaysia. The data only covers Energy sector. Any companies with missing data will be excluded from the study. Since this study focuses on financial condition of the company, hence all the information will be collected from the financial report of each company. While, the accounting information data is taken from Bursa Malaysia as well as Bloomberg.

### **3.4 Sampling**

This research uses quantitative approach where it aims to investigate certain population or sample. The study intends to identify the financial health of energy companies listed in Bursa Malaysia. The data are collected from Bursa Malaysia by using filter section which is Energy. These data are taken as per November 2020. There are total 30 companies used in this study where four companies are registered under Practice Note 17 (PN17). Hence, below are the lists of the Energy Companies:

<b>Code</b>	<b>Company Name</b>	<b>Code</b>	<b>Company Name</b>
5115	Alam Maritim Resources Bhd	7108	Perdana Petroleum Bhd
5210	Bumi Armada Berhad	3042	Petron Malaysia Refining &
5257	Carimin Petroleum Bhd	5256	Reach Energy Bhd
5071	Coastal Contracts Bhd	5218	Sapura Energy Bhd
0091	Daya Materials Bhd	5279	Serba Dinamik Holdings
5141	Dayang Enterprise Hldgs Bhd	7228	T7 Global Bhd
5132	Deleum Berhad	2739	Techna-X Bhd
7277	Dialog Group Bhd	7250	Uzma Bhd
7253	Handal Energy Bhd	5243	Velesto Energy Bhd
4324	Hengyuan Refining Co Bhd	5142	Wah Seong Corp Bhd
5199	Hibiscus Petroleum Bhd	7293	Yinson Holdings Bhd
5255	Icon Offshore Bhd	5186	Malaysia Marine And Heavy En
7164	Knm Group Bhd	5133	Petra Energy Bhd
<b>Practice Note 17 (PN17)</b>			
7206	Th Heavy Engineering Bhd	7045	Scomi Energy Services Bhd
7158	Scomi Group Bhd	7251	Barakah Offshore Petroleum

*Source: Bursa Malaysia Website*

### 3.5 Data Analysis Technique

This study uses measurements which focuses on the financial ratios and financial health of the listed energy companies to answer the research questions. The nature of this study is descriptive analysis and comparative analysis. Descriptive analysis is normally used to describe a state of the company systematically, actual and accurately by collecting the data or information which appear in the company or organization, while comparative analysis is a method where two or more datasets are analysed to compare the consistency between one and another. The data in this study is tested and analysed using statistical package for social science (SPSS) software.

### 3.6 Altman Z-Score Model

This research uses the z-score formula which was originally constructed by Altman (1968) to identify the financial distress companies. The z-score formula is as follows:

$$\text{Z-Score} = 1.2 * X1 + 1.4 * X2 + 3.3 * X3 + 0.6 * X4 + 0.999 * X5$$

Where:

X1 = Working Capital / Total Assets

X2 = Retained Earnings / Total Assets

X3 = Earnings Before Interest and Taxes / Total Assets

X4 = Market Value of Equity / Book Value of Debt

X5 = Sales / Total Assets

#### 3.6.1 X1: Working Capital/Total Assets

This is a liquidity ratio that measuring the net liquid assets (the difference between current assets and current liabilities) of a company over the company's total capital (Khaliq A, et al. 2014).

#### 3.6.2 X2: Retained Earnings/Total Assets

It measures the firms' leverage whereby the formula analyze how much the firms' assets are financed by its own funds. The account where excess earnings are accrued and reported is known as retained earnings, and the higher the ratio of retained earnings to total assets in hand, the less debt a business can use due to the retention of income. (Khaliq A, et al. 2014).

### 3.6.3 X3: Earnings Before Interest and Taxes / Total Assets

This variable measures the productivity of the company (Altman, 2000) as it disregards the existence of tax and leverage factors affecting the actual earnings of the company. According to Altman (2000), this ratio outperforms other profitability ratio including the cash flow ratio and this ratio is very beneficial in determining corporate failure as the reason for a company's existence is the earning power of the company's owned assets.

### 3.6.4 X4: Market Value of Equity / Book Value of Debt

According to Khaliq A, et al. 2014, this variable is a solvency ratio where the maximum fall in a company's equity value before the company falls under the 'insolvent' category is tabulated. The total liabilities include both long and short term liabilities as reported in the annual report, while the market value of equity is measured as the number of all shares, both common and preferred stock.

### 3.6.5 X5: Sales / Total Assets

It describes the ability of the company's assets in producing sales (Khaliq A, et al. 2014)

The Altman Z - scores is actually shows the figures that can be used to categorize a company into the financial distressed and non – financial distressed company. The categories descriptions are as follows:

No	Range of Z-Score	Interpretation
1	Above than 2.99	The company is in good position and safe from financial problem.
2	Between 1.81 and 2.99	Warning Sign! It is considered as grey area as the company have chances to faces bankruptcy problem.
3	Less than 1.81	Bad Indication! The company is most likely to be heading towards bankruptcy problem. Necessary actions are needed to avoid from the worst situation.

### 3.7 The Grover Model

This research uses processed data from financial statements of companies to predict the bankruptcy. This method was founded by Jeffrey S. Grover. The formula of G-Score was as follow:

$$\text{G-Score} = 1,650X1 + 3,404X2 - 0,016ROA + 0,057$$

Description:

X1 = Working Capital / Total Assets

X2 = Earnings Before Interest and Tax / Total Assets

ROA = Net Income / Total Assets

#### 3.7.1 Working Capital to Total Assets (X1)

Working Capital to Total Assets is a financial ratio which shows the ability of company to generate net working capital from all assets owned. If the value of this ratio is negative, it is likely that the company has difficulty in repaying its short-term liabilities by using its current assets. Conversely, if the value is positive, it shows that the company has ability to pay off its short-teem liabilities using its current asset.

#### 3.7.2 Earnings Before Interest and Tax to Total Assets (X2)

Earnings Before Interest and Tax to Total Assets is a part of profitability ratio where it shows the ability of a company to generate profit before interest and tax deducted from all assets owned.

#### 3.7.3 Return on Assets (ROA)

Return on Asset is also part of profitability ratio where it shows the ability of a company to generate profit after interest and tax deducted from all assets owned.

No	Range of G-Score	Interpretation
1	<b>(G ≤ - 0.02)</b>	The company is having financial distress (bankruptcy)
2	<b>(G ≥ 0.01)</b>	The company is in good position and safe from financial problem.
3	<b>G-Score between -0.02 to 0.01</b>	Grey Area

### 3.8 Zmijewski Model

This model was developed by Mark E. Zmijewski in 1984. He conducted his research for the distress and non-distress companies of population between 2.082 – 2.241 in 1972 to 1978. According to research done by Fatmawati (2012), it is explained that in order to build a financial prediction model, Zmijewski model uses ratio analysis to measure the performance, leverage and liquidity of a company by using probit analysis.

The following is a model equation of Zmijewski:

$$\text{X-Score} = -4,3 - 4,5X1 + 5,7 X2 - 0,004X3$$

Where:

X1: Return on Asset (Net Income / Total Assets)

X2: Debt Ratio (Total Liabilities / Total Assets)

X3: Current Ratio (Current Assets / Current Liabilities)

#### 3.8.1 Return on Asset (Net Income / Total Assets)

ROA is a profitability ratio which shows how much profit a company is able to generate from its assets. ROA measures the efficiency of a company in generating income from its economic resources or assets on its balance sheet.

#### 3.8.2 Debt Ratio (Total Liabilities / Total Assets)

Debt ratio is generally translated as the proportion of a company's assets which are financed by debt. The higher the ratio (DR >1.0) simply means that the company has more liabilities than assets and it will place the company at risk of default on its loan.

#### 3.8.3 Current Ratio (Current Assets / Current Liabilities)

Current ratio is a liquidity ratio which measure the company's ability to pay its short-term obligations or those are due within a year. If the ratio is less than 1.0 (CR < 1.0) means the company does not have capital in hand to meet its short-term obligations when they are all due at once and vice versa.

No	Range of X-Score	Interpretation
1	<b>(<math>X &lt; 0</math>)</b> X-Score is less than 0.0	The company is in good position and safe from financial problem.
2	<b>(<math>X \geq 0</math>)</b> X-Score is equal to or more than 0.0	The company is predicted to having financial distress (bankruptcy)

The cut-off applies to this model is 0. It means if the company has a score greater than or equal to 0, therefore the company is predicted to experience financial distress in the future. However, if the score is less than 0, hence, the company is considered financially healthy and not expected to experience financial distress.



## CHAPTER 4

### RESULT AND DISCUSSION

#### 4.0 Introduction

This chapter presents the findings and discussions of the study. The data collected has been analysed using Statistical Package for the Social Sciences (SPSS), and the population of this research are all energy sector companies listed in Bursa Malaysia. The texts, figures and table are the medium or form used in presenting the analysis of the collected data. The analysis includes of the calculation results, the descriptive analysis as well as the comparative analysis of the three financial distress models.

#### 4.1 Results

Prediction of financial distress among all energy sector companies listed in Bursa Malaysia from 2016 to 2020 tend to fluctuate every year on this research as seen as the below table:

##### 4.1.1 Altman Z-Score Model

The results of financial failure calculation using Altman Z-score as show in the following table:

Code	Company Name	2016	2017	2018	2019	2020
5115	Alam Maritim Resources	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5210	Bumi Armada Berhad	Bankrupt	Bankrupt	Bankrupt	Safe	Bankrupt
5257	Carimin Petroleum	Safe	Bankrupt	Grey	Safe	Grey
5071	Coastal Contracts	Grey	Grey	Bankrupt	Grey	Bankrupt
0091	Daya Materials Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5141	Dayang Enterprise Hldgs	Safe	Bankrupt	Safe	Safe	Grey
5132	Deleum Berhad	Grey	Grey	Grey	Grey	Grey
7277	Dialog Group Bhd	Safe	Safe	Safe	Safe	Safe
7253	Handal Energy Bhd	Bankrupt	Grey	Safe	Bankrupt	Bankrupt
4324	Hengyuan Refining co Bhd	Safe	Safe	Safe	Safe	Safe

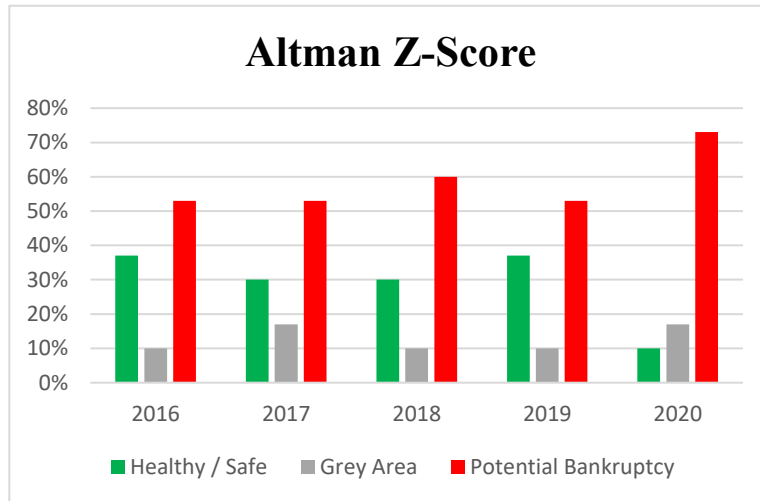


5199	Hibiscus Petroleum	Safe	Safe	Safe	Safe	Bankrupt
5255	Icon Offshore Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
7164	Knm Group Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5186	Malaysia Marine And Heavy	Bankrupt	Grey	Bankrupt	Bankrupt	Bankrupt
5133	Petra Energy Bhd	Bankrupt	Bankrupt	Bankrupt	Grey	Grey
7108	Perdana Petroleum	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
3042	Petron Malaysia Refining	Safe	Safe	Safe	Safe	Safe
5256	Reach Energy Bhd	Safe	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5218	Sapura Energy Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5279	Serba Dinamik Holdings	Safe	Safe	Safe	Safe	Grey
7228	T7 Global Bhd	Safe	Grey	Grey	Safe	Bankrupt
2739	Techna-X Bhd	Bankrupt	Safe	Safe	Bankrupt	Bankrupt
7250	Uzma Bhd	Safe	Bankrupt	Safe	Safe	Bankrupt
5243	Velesto Energy Bhd	Bankrupt	Safe	Bankrupt	Bankrupt	Bankrupt
5142	Wah Seong Corp Bhd	Bankrupt	Safe	Bankrupt	Safe	Bankrupt
7293	Yinson Holdings Bhd	Safe	Safe	Safe	Bankrupt	Bankrupt
<b>Practice Note 17</b>						
7251	Barakah Offshore Petroleum	Grey	Bankrupt	Bankrupt	Bankrupt	Bankrupt
7206	Th Heavy Engineering Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
7158	Scomi Group Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
7045	Scomi Energy Services Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt

**Table 1 (Altman Z-Score)**

**Source: Energy Sector Listed Firms Financial Statement (Processed Data)**

<b>Status</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Healthy / Safe	37%	30%	30%	37%	10%
Grey Area	10%	17%	10%	10%	17%
Potential Bankruptcy	53%	53%	60%	53%	73%



From the table above (Table 3: Altman Z-score Model), the highest percentage of potential financial failure company fall in 2020 with 73%. While for the highest percentage for healthy company fall in 2016 and 2019 with 37%. Few important variables used for Altman Z-Score calculation such as Working Capital, Total Assets, and Earnings Before Interest and Taxes. 70% of energy sector companies suffered from total assets declined in 2020, while 67% of companies suffered from EBIT declined as well as working capital slump in 2020. These aspects might lead to heightening the increase of bankruptcy percentage in 2020.

#### 4.1.2 Grover Model

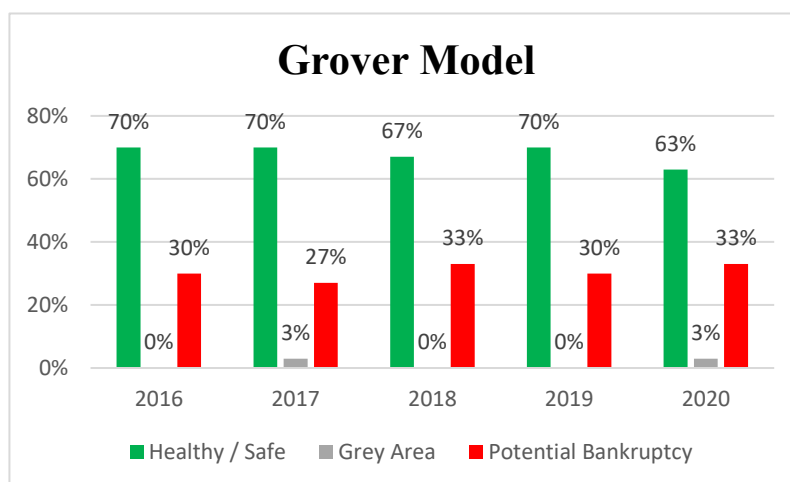
The results of financial failure calculation using the Grover Model as show in the following table:

Code	Company Name	2016	2017	2018	2019	2020
5115	Alam Maritim Resources Bhd	Safe	Grey	Safe	Safe	Grey
5210	Bumi Armada Berhad	Bankrupt	Bankrupt	Bankrupt	Safe	Safe
5257	Carimin Petroleum	Safe	Safe	Safe	Safe	Safe
5071	Coastal Contracts	Safe	Safe	Safe	Safe	Safe
0091	Daya Materials Bhd	Bankrupt	Safe	Bankrupt	Bankrupt	Bankrupt
5141	Dayang Enterprise Hldgs Bhd	Safe	Bankrupt	Bankrupt	Safe	Safe
5132	Deleum Berhad	Safe	Safe	Safe	Safe	Safe
7277	Dialog Group Bhd	Safe	Safe	Safe	Safe	Safe
7253	Handal Energy Bhd	Safe	Safe	Safe	Bankrupt	Safe
4324	Hengyuan Refining Co	Safe	Safe	Safe	Safe	Safe

5199	Hibiscus Petroleum	Bankrupt	Safe	Safe	Safe	Safe
5255	Icon Offshore Bhd	Safe	Bankrupt	Bankrupt	Bankrupt	Safe
7164	Knm Group Bhd	Safe	Safe	Safe	Safe	Safe
5186	Malaysia Marine And Heavy	Safe	Safe	Safe	Safe	Bankrupt
5133	Petra Energy Bhd	Bankrupt	Bankrupt	Safe	Safe	Safe
7108	Perdana Petroleum	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
3042	Petron Malaysia Refining & M	Safe	Safe	Safe	Safe	Bankrupt
5256	Reach Energy Bhd	Bankrupt	Bankrupt	Bankrupt	Safe	Safe
5218	Sapura Energy Bhd	Safe	Safe	Bankrupt	Bankrupt	Safe
5279	Serba Dinamik Holdings Bhd	Safe	Safe	Safe	Safe	Safe
7228	T7 Global Bhd	Safe	Safe	Safe	Safe	Safe
2739	Techna-X Bhd	Safe	Safe	Safe	Bankrupt	Safe
7250	Uzma Bhd	Safe	Safe	Safe	Safe	Safe
5243	Velesto Energy Bhd	Bankrupt	Bankrupt	Safe	Safe	Bankrupt
5142	Wah Seong Corp Bhd	Bankrupt	Safe	Safe	Safe	Bankrupt
7293	Yinson Holdings Bhd	Safe	Safe	Safe	Safe	Safe
<b>Practice Note 17</b>						
7251	Barakah Offshore Petroleum	Safe	Safe	Bankrupt	Safe	Bankrupt
7206	Th Heavy Engineering Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
7158	Scomi Group Bhd	Safe	Safe	Bankrupt	Bankrupt	Bankrupt
7045	Scomi Energy Services Bhd	Safe	Safe	Safe	Bankrupt	Bankrupt

**Table 2 (Grover Model)**  
**Source: Energy Sector Listed Firms Financial Statement (Processed Data)**

Status	2016	2017	2018	2019	2020
Healthy / Safe	70%	70%	67%	70%	63%
Grey Area	0%	3%	0%	0%	3%
Potential Bankruptcy	30%	27%	33%	30%	33%



From the table 2 above (Grover Model), it shows that the highest percentage of potential bankruptcy among energy sector companies in Malaysia with 33% occurred in 2018 and 2020. The overall result shows slightly different percentage between healthy firms and potential bankruptcy firms from year 2016 to 2020. The important variables used for this model are similar as Altman Z-Score model, which is Working Capital, Total Assets, EBIT and Return on Assets. Based on the result in this study, the companies who are categorised under Bankruptcy are the one with very low Return on Assets (ROA).

#### 4.1.3 Zmijewski Model

The results of financial failure calculation using Zmijewski Model as show in the following table:

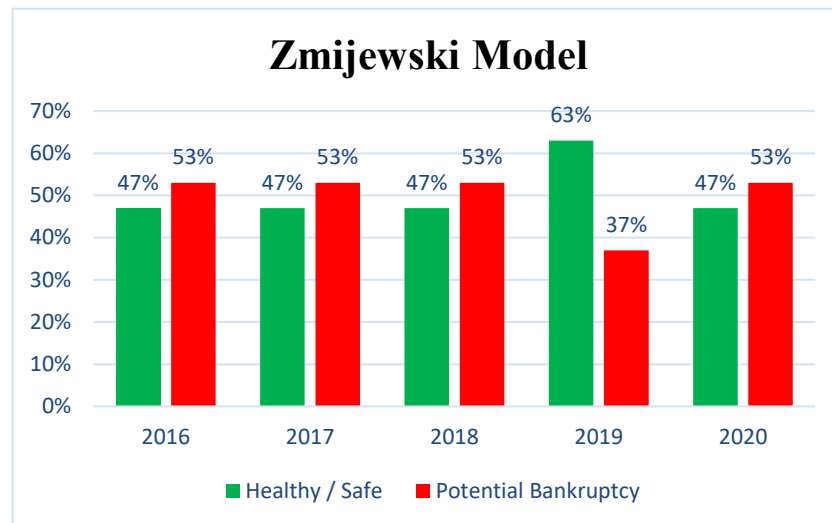
Code	Company Name	2016	2017	2018	2019	2020
5115	Alam Maritim Resources	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5210	Bumi Armada	Bankrupt	Safe	Bankrupt	Safe	Safe
5257	Carimin Petroleum Bhd	Safe	Bankrupt	Safe	Safe	Safe
5071	Coastal Contracts Bhd	Safe	Safe	Bankrupt	Safe	Bankrupt
0091	Daya Materials	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5141	Dayang Enterprise Hldgs	Safe	Bankrupt	Safe	Safe	Safe
5132	Deleum Berhad	Safe	Safe	Safe	Safe	Safe
7277	Dialog Group Bhd	Safe	Safe	Safe	Safe	Safe
7253	Handal Energy	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
4324	Hengyuan Refining	Safe	Safe	Safe	Safe	Safe
5199	Hibiscus Petroleum Bhd	Safe	Safe	Safe	Safe	Bankrupt
5255	Icon Offshore Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Safe

7164	Knm Group Bhd	Bankrupt	Bankrupt	Bankrupt	Safe	Safe
5186	Malaysia Marine And Heavy En	Bankrupt	Safe	Bankrupt	Bankrupt	Bankrupt
5133	Petra Energy Bhd	Bankrupt	Bankrupt	Bankrupt	Safe	Safe
7108	Perdana Petroleum Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
3042	Petron Malaysia Refining & M	Safe	Safe	Safe	Safe	Bankrupt
5256	Reach Energy Bhd	Safe	Bankrupt	Bankrupt	Bankrupt	Bankrupt
5218	Sapura Energy	Bankrupt	Bankrupt	Bankrupt	Safe	Bankrupt
5279	Serba Dinamik Holdings Bhd	Safe	Safe	Safe	Safe	Safe
7228	T7 Global Bhd	Safe	Safe	Safe	Safe	Safe
2739	Techna-X Bhd	Bankrupt	Safe	Safe	Bankrupt	Bankrupt
7250	Uzma Bhd	Safe	Safe	Safe	Safe	Bankrupt
5243	Veledo Energy	Bankrupt	Bankrupt	Safe	Safe	Safe
5142	Wah Seong Corp	Bankrupt	Safe	Safe	Safe	Bankrupt
7293	Yinson Holdings	Safe	Safe	Safe	Safe	Safe
<b>Practice Note 17</b>						
7251	Barakah Offshore Petroleum	Safe	Bankrupt	Bankrupt	Bankrupt	Safe
7206	Th Heavy Engineering Bhd	Bankrupt	Bankrupt	Bankrupt	Safe	Bankrupt
7158	Scomi Group Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt
7045	Scomi Energy Services Bhd	Bankrupt	Bankrupt	Bankrupt	Bankrupt	Bankrupt

**Table 3 (Zmijewski Model)**

**Source: Energy Sector Listed Firms Financial Statement (Processed Data)**

Status	2016	2017	2018	2019	2020
Healthy / Safe	47%	47%	47%	63%	47%
Potential Bankruptcy	53%	53%	53%	37%	53%



Zmijewski model is a little different from Altman Z-score model and Grover model where this model has no grey area. Therefore, from the result above, it shows consistent result except for the year 2019 where the percentage of potential bankruptcy firm declined to 37% as well as percentage of healthy firms which is 63%. This is due to the decrease in debt ratio as well as current ratio since Zmijewski model uses Current Ratio, Debt Ratio and ROA.

Based on the result, it is very important for the companies to have strong position of Net Working Capital. The decrease in Net Working Capital is certainly a warning for the corporates' management to take necessary actions in order to avoid any further financial distress for the companies. According to the result of PN17 companies, there was a decline in Net Working Capital year over year. Additionally, the result for both Bumi Armada (5210) and Sapura Energy (5218) showed that both companies have the lowest Net Working Capital, and referring to bankruptcy model calculation, the three bankruptcy models predicted financial distress for these companies. According to Kamal (2010), if the ratio is positive, it is likely the company will not face any financial distress.

Return on assets is another vital ratio to predict financial distress. According to Zoltan et al. (2020), based on the study conducted on Bank Financial ratios, it shows that ROA is one of the ratios that can be used for corporate financial failure prediction. The higher the ratio, the soundness the financial position of the firms.

Based on the result of ROA calculation in this study, it shows that all the ROA value for PN17 listed companies are negative. It simply proves how important ROA to predict financial distress. While the value of ROA for well established companies such as Petron Malaysia (3042) and Hengyuan Refining (4324) are above 5 percent. This result is supported by the calculation result

of three bankruptcy models (Altman, Grover and Zmijewski), where the result shows that these companies are financially healthy. This result is consistent with the result of study conducted by Nguyen et al. (2019) where the study showed that the higher the ROA value, the lower of the risks of bankruptcy probability and vice versa.

#### 4.2 Descriptive Analysis

Descriptive analysis of this study aims to describe the mean, maximum, minimum as well as the standard variation of each variables. Therefore, the descriptive statistics for three bankruptcy models (Altman, Grover and Zmijewski) as shown in the table below:

	N	Minimum	Maximum	Mean	Std. Deviation
Altman	150	-1,093.36	7.09	-6.17	89.39
Grover	150	--2,075.02	1.47	-13.73	169.43
Zmijewski	150	-125.72	3,321.34	37.76	277.67
Valid N (listwise)	150				

*Table 4: Descriptive Analysis*  
*Source: Data analysis on IBM SPSS statistics*

The number of data used in this study is 150 which means that this study is analysing 30 companies' financial position for 5 years (2016 to 2020). Based on the descriptive analysis above, here is the result explanation.

1. The minimum value of Altman Z-Score model is -1,093.36 which means the company is predicted the worst to face bankruptcy is Scomi Group (7158) as this company has registered under PN17. While the maximum value of Altman Z-score model is 7.09. It means Petron Malaysia Refining & Marketing (3042) has the safest financial condition. The average value of Altman Z-Score model is -6.17 while the standard deviation is 89.39.
2. The minimum value of Grover model is -2,075.02, similarly as Altman Z-score model, the Grover model predicted that Scomi Group (7158) has the worst financial condition and the company is predicted to face bankruptcy. While the maximum value of this model is 1.47, it means that Hengyuan Refining Co Bhd (4324) has the healthiest financial position. The Grover model has mean value of -13.73 while the standard deviation is 169.43.

3. The Zmijewski model descriptive analysis is consistent with Grover model. The minimum value of Zmijewski model is -125.72, it means that Hengyuan Refining Co Bhd (4324) has the healthiest financial position among selected group. While the maximum value is 3,321.34. It means this model has predicted that Scomi Group (7158) is facing bankruptcy. The average value of this model is 37.76 while the standard deviation is 277.67.

### 4.3 Comparative Analysis.

The comparative analysis in this study is using independent t-test since this study aims to compare the means a normally distributed interval dependent variable for two independent group. And the independent t-test is used to test the hypothesis of this research. Therefore, the comparative analysis result as shown in the table below.

Bankruptcy Model	Mean Difference	Std-Error Difference	Sig. (2-tailed)	95% Confidence Interval	
				Lower	Upper
Altman - Grover	7.582	15.642	.628	-23.199	38.365
Altman - Zmijewski	-43.909	23.817	.067	-90.907	3.088
Grover - Zmijewski	-51.492	26.559	.053	-103.759	.775

*Table 5: Comparative Analysis (Independent T Test)  
Source: Data analysis on IBM SPSS statistics*

This study intends to compare to sig. (2-tailed) value to test the hypothesis:

- If the Sig. (2-tailed) < 0.05, it means there is significant difference between the two-bankruptcy model. Therefore, H1 is accepted.
- If the Sig. (2-tailed) > 0.05, it means there is no significant difference between the two-bankruptcy model. Therefore, H0 is accepted, and H1 is rejected.

#### 4.3.1 Hypothesis One (H<sub>1</sub>: Altman and Grover)

**H<sub>1</sub>.** There is a significant difference between of Altman Z-score model and Grover model in determining financial distress among energy sector companies listed in Bursa Malaysia.

Based on the result in the table 5, the Sig. (2-tailed) value is 0.628 > 0.05. It means there is no significant difference between Altman Z-score model and Grover model analysis in determining



financial distress among energy companies listed in Bursa Malaysia. Therefore, H1 is rejected. This result is inconsistent with a research conducted by Yulaeha et al. (2020) where the result shows there was a significant difference between Altman Z-Score model and Grover model in determining financial distress among the coal subsector mining companies listed in Indonesia Stock Exchange.

#### **4.3.2 Hypothesis Two (H<sub>2</sub>: Altman and Zmijewski)**

**H<sub>2</sub>.** There is a significant difference between of Altman Z-score model and Zmijewski model in determining financial distress among energy sector companies listed in Bursa Malaysia.

Based on the result in the table 5, the Sig. (2-tailed) value is  $0.067 > 0.05$ . It means there is no significant difference between Altman Z-score model and Grover model analysis in determining financial distress among energy companies listed in Bursa Malaysia. Therefore, H2 is rejected. This result is consistent with the study conducted by Fairuz's (2016) where Altman Z-Score model and Zmijewski model had no significant difference in determining financial failure of the firms.

#### **4.3.3 Hypothesis Three (H<sub>3</sub>: Grover and Zmijewski)**

**H<sub>3</sub>.** There is a significant difference between of Grover model and Zmijewski model in determining financial distress among energy sector companies listed in Bursa Malaysia.

Based on the result in the table 5, the Sig. (2-tailed) value is  $0.053 > 0.05$ . It means there is no significant difference between Grover model and Zmijewski model analysis in determining financial distress among energy companies listed in Bursa Malaysia. Therefore, H3 is rejected. This result is consistent with a research conducted by Sasongko, et al. (2015) and Meita (2015) where there was no significant difference between Grover and Zmijewski method in determining corporates financial distress among 15 companies incorporated in the Jakarta Islamic Index as well as in coal mining companies.

## CHAPTER 5

### CONCLUSION AND RECOMMENDATION

#### 5.0 Introduction

The purpose of this chapter is to discuss the conclusion of the study, recommendations as well as the limitation proposed for the future research.

#### 5.1 Summary of Findings

The global pandemic has badly impacted many businesses due to movement restriction and this event has brought a repricing of risk across the global economy and to the energy sector business in particular. The International Energy Agency projected that the global energy use would fall by 6% in 2020 which is the biggest shock in 70 years. Coal and oil demand were the hardest hit by global pandemic due to restrictions on economic activity such as halted the factory production as well as the movement and travel restrictions. At the first stage of pandemic, the oil price was negative due to the fall in demand as a result of major lockdown in the most part of the world. The price collapse was a clear signal of a coming wave of defaults by oil and gas borrowers which led to more than 20 companies filing for bankruptcy.

Based on the results of this study, it can be concluded that the three bankruptcy models: Altman Z-Score, Grover G-Score and Zmijewski X-Model can be used to predict or identify financial failure for energy sector companies listed in Bursa Malaysia despite various ratios used for calculation of each model. It is proven by the analysis result of Practice Note 17 (PN17), it shows that all the three models have predicted that all energy sector companies registered under PN17 are in financial distress. However, the result shows that Altman Z-Score model is the most significant model to predict bankruptcy or financial failure for energy sector companies listed in Bursa Malaysia since this model predicted that the four (PN17) companies have been experiencing financial issues since 2016 to 2020.

The descriptive analysis in this study shows that Altman Z-Score, Grover and Zmijewski model predicted that Scmi Group (7158) is the worst firm to experience bankruptcy. Altman Z-score model predicted that Petron Malaysia (3042) is the safest company and it is not likely to experience any financial distress while Grover and Zmijewski model predicted that Hengyuan Refining (4324) is the healthiest firm.

The comparative analysis in this study is done by using the independent t-test to show the

relationship or significancy between two models. The comparative analysis shows:

1. There is no significant difference between Altman Z-Score model and Grover model.
2. There is no significant difference between Altman Z-Score model and Zmijewski model.
3. There is no significant difference between Grover Model and Zmijewski model.

These three models use various ratios to calculate or to identify financial distress, however. the similarity of Altman Z-Score model and Grover model is one of the ratios used to predict financial failure is profitability ratio ( $\text{EBIT} / \text{Total Asset}$ ) while Grover model and Zmijewski model uses return on asset ratio ( $\text{Net Income} / \text{Total Asset}$ ).

Corporates' financial distress prediction is an early sign for companies to take necessary actions and pay more attention on the financial position of the firms. The results data or information can help the management to restructure the plan and strategy to avoid further vulnerable and place the company in a very bad position. While investors may use the information before making any investment decisions and creditors may use the information before granting any financial assistance request from the firms. Furthermore, this information can also be used for by auditors and the stakeholders of the firms.

## **5.2 Limitation and Recommendation**

There are limitations on this study which may affect the results. Firstly, the time period of this study is only 5 years. The result may be more accurate if longer period of time is used to identify financial failure. Secondly, the sample data only covers energy sector companies in this research. The results would be better if a larger sample size is used.

There are several opportunities for future investigation in this area. Researcher suggests for the future study to use a wider or larger research sample, comparing more financial distress models, and not focus on one industry. Longer time-period of research study can be used for a better and more accurate results.

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## APPENDIX I

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Score	150	-1093.36	7.09	-6.1747	89.39098
Altman Z-Score	150	1.00	1.00	1.0000	.00000
Valid N (listwise)	150				

#### *Altman Z-Score Descriptive Analysis*

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Score	150	-2075.02	1.47	-13.7314	169.43444
Grover	150	2.00	2.00	2.0000	.00000
Valid N (listwise)	150				

#### *Grover Model Descriptive Analysis*

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Score	150	-125.72	3321.34	37.7606	277.66740
Zmijewski	150	3.00	3.00	3.0000	.00000
Valid N (listwise)	150				

#### *Zmijewski Model Descriptive Analysis*

## APPENDIX II

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	.708	.401	.485	298	.628	7.58260	15.64163	-23.19944	38.36464
	Equal variances not assumed			.485	225.985	.628	7.58260	15.64163	-23.23949	38.40469

### *Comparative Analysis Test (Independent T Test) Altman and Grover*

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	6.393	.012	-1.844	298	.066	-43.90945	23.81739	-90.78104	2.96215
	Equal variances not assumed			-1.844	179.558	.067	-43.90945	23.81739	-90.90744	3.08855

### *Comparative Analysis Test (Independent T Test) Altman and Zmijewski*

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	3.079	.080	-1.939	298	.053	-51.49205	26.55902	-103.75904	.77495
	Equal variances not assumed			-1.939	246.450	.054	-51.49205	26.55902	-103.80366	.81956

### *Comparative Analysis Test (Independent T Test) Grover and Zmijewski*

**APPENDIX III**  
**Return on Asset (ROA) Table**

<b>Code</b>	<b>Company Name</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
5115	Alam Maritim Resources Bhd	-12.23	-15.97	-22.86	-12.48	-12.48
5210	Bumi Armada Berhad	-9.80	1.72	-13.40	0.40	0.94
7251	Barakah Offshore Petroleum	1.85	-12.52	-12.04	-84.42	5.66
5257	Carimin Petroleum Bhd	0.01	-2.94	1.07	8.46	0.04
5071	Coastal Contracts Bhd	1.30	1.70	-27.12	0.58	-9.19
0091	Daya Materials Bhd	-18.47	-6.16	-8.95	-8.20	-19.21
5141	Dayang Enterprise Hldgs Bhd	1.71	-4.97	5.93	8.38	2.03
5132	Deleum Berhad	3.96	5.08	4.29	4.71	1.19
7277	Dialog Group Bhd	7.51	8.71	7.67	8.45	7.65
7253	Handal Energy Bhd	-8.58	-1.79	-3.02	-3.02	-19.76
4324	Hengyuan Refining Co Bhd	11.12	27.63	0.79	0.71	4.95
5199	Hibiscus Petroleum Bhd	19.30	2.73	19.09	6.20	-3.65
5255	Icon Offshore Bhd	-10.52	-4.61	-42.97	-1.30	3.35
7164	Knm Group Bhd	-7.44	-1.14	-18.76	1.23	1.81
5186	Malaysia Marine And Heavy En	-3.39	0.98	-3.74	-1.07	-12.47
5133	Petra Energy Bhd	-11.80	-5.58	-2.81	9.66	2.58
7108	Perdana Petroleum Bhd	-1.71	-11.85	-2.92	-1.72	-5.37
3042	Petron Malaysia Refining & M	9.66	15.09	7.67	5.61	-0.43
5256	Reach Energy Bhd	0.54	-0.49	-2.51	-8.08	-9.46
5218	Sapura Energy Bhd	-2.38	-1.11	-7.89	0.60	-16.62
7158	Scomi Group Bhd	-1.41	-6.65	-11.29	-38.87	-35.74
7045	Scomi Energy Services Bhd	-5.43	-10.44	-14.46	-7.91	-26.39
5279	Serba Dinamik Holdings Bhd	11.68	13.60	11.41	9.32	8.74
7228	T7 Global Bhd	2.41	0.80	2.59	2.87	2.17
2739	Techna-X Bhd	-45.26	19.95	6.39	-44.27	-75.62
7206	Th Heavy Engineering Bhd	-28.88	-9.36	-0.38	3.78	-2.60
7250	Uzma Bhd	1.14	2.16	1.81	2.44	-2.29
5243	Velesto Energy Bhd	-16.71	-19.96	-0.39	0.77	0.28
5142	Wah Seong Corp Bhd	-7.88	3.91	2.18	0.89	-11.96
7293	Yinson Holdings Bhd	3.94	4.65	3.23	2.38	2.98

**APPENDIX IV**  
**Working Capital Table**

<b>Code</b>	<b>Company Name</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
5115	Alam Maritim Resources Bhd	88.21	37.14	86.59	70.76	22.39
5210	Bumi Armada Berhad	-446.94	-3,271.66	-6,092	-1,260.09	-214.39
7251	Barakah Offshore Petroleum	203.14	192.98	77.05	-133.79	-240.82
5257	Carimin Petroleum Bhd	79.92	65.64	75.52	81.78	84.36
5071	Coastal Contracts Bhd	1,441.08	1,423.03	825.98	470.69	395.97
0091	Daya Materials Bhd	46.99	15.39	-214.14	-190.27	-243.68
5141	Dayang Enterprise Hldgs Bhd	31.97	-884.95	-778.78	283.15	412.72
5132	Deleum Berhad	138.82	164.27	153.75	151.37	168.08
7277	Dialog Group Bhd	719.31	858.35	728.80	503.36	796.81
7253	Handal Energy Bhd	49.54	52.43	50.15	13.03	13.03
4324	Hengyuan Refining Co Bhd	1,435.48	2,179.74	1,219.42	805.46	833.94
5199	Hibiscus Petroleum Bhd	-74.56	42.27	94.03	-53.51	174.77
5255	Icon Offshore Bhd	-129.84	-261.51	-552.06	-557.58	69.05
7164	Knm Group Bhd	274.42	112.41	138.33	80.29	-219.85
5186	Malaysia Marine And Heavy En	681.09	738.19	549.66	534.06	310.88
5133	Petra Energy Bhd	35.90	9.21	39.88	82.89	105.73
7108	Perdana Petroleum Bhd	-164.25	-703.90	-815.45	-163.42	-58.80
3042	Petron Malaysia Refining & M	225.82	485.48	519.59	57.65	-267.42
5256	Reach Energy Bhd	-270.00	-83.40	-279.97	-13.21	-65.96
5218	Sapura Energy Bhd	19.65	328.88	-4,218	-133.69	-1,929.68
7158	Scomi Group Bhd	464.68	344.23	-29.40	-183.53	-241.00
7045	Scomi Energy Services Bhd	304.86	320.60	51.09	7.00	-49.00
5279	Serba Dinamik Holdings Bhd	340.98	716.36	1,771.29	3,039.41	3,637.88
7228	T7 Global Bhd	85.14	96.75	103.16	130.77	43.01
2739	Techna-X Bhd	67.29	146.56	177.14	15.05	-61.53
7206	Th Heavy Engineering Bhd	-733.06	-925.01	-320.88	-316.62	-343.93
7250	Uzma Bhd	29.61	79.68	205.39	213.14	123.46
5243	Velesto Energy Bhd	-802.87	514.72	612.10	376.31	438.48
5142	Wah Seong Corp Bhd	-478.59	115.29	-266.31	-107.41	-175.63
7293	Yinson Holdings Bhd	282.17	470.59	574.48	1,022.44	1,797.30